Clause Positions

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1 Arguments and Relatives

There are two things about clausal arguments that stand out. The first is their unique syntactic distribution among arguments. This can be appreciated most clearly in OV languages like German and Hindi, where finite clausal arguments sit in the post-verbal field, unlike other arguments of the verb. The second is the old intuition that, at least in many Indo-European languages, argument clauses and relative clauses are somehow related. The subordinator that introduces argument clauses is often identical to the relativizer.

(1) Subordinator similarity (Arsenijevic 2009)

	Argument	
Language	Complementizer	Relativizer
Brabant Dutch	dat	dat
Serbo-Croatian	*š*to	*š*to
French	que	que
Italian	che	che
⋮	⋮	⋮

Of course, the modern tradition has taken this identity to be reflective only of shared category membership (tensed C). The comparison between argument and relative CPs stops there. We all teach that the grammatical function and semantic role of relative and argument CPs are very different.

In recent years, though, the traditional idea that there is a deeper similarity between relatives and argument CPs has gained renewed plausibility (Caponigro and Polinsky 2011, Kayne 2009, Arsenijevic 2009). And, in a one specific way, this paper will advocate something similar. Using as evidence nominalization patterns of clause-taking predicates (the 'Higgins-Stowell' facts, Higgins 1972; Stowell 1981; Grimshaw 1990)[1], in earlier work (Moulton 2009, 2013) I argued that CPs are like relatives in at least the

[1]Conclusions from the Higgins-Stowell facts are sometimes challenged (Safir 1985; Ogawa 2001; Pesetsky and Torrego 2002). The empirical landscape will be clarified in §3.

following way: they are *semantically* nominal restrictors or modifiers. In this paper, I explain the repercussions this conclusion has throughout the grammar. One of its corollaries is that CPs don't saturate verbal predicates. The consequence of this, we'll see, explains the unique distribution of (tensed) CP arguments.

The reason we ought to seek such a connection—between the 'relativey-ness' of CPs and their exceptional distribution among arguments—is given to us by Bayer (1995, 1999). A number of Indo-Aryan languages—Bengali, for instance—have one kind of complementizer that puts a clausal complement to the left of the verb, where arguments in such OV languages are expected. Another complementation strategy, which is of a kind with the examples cited in (1), puts the CP at the right edge of the verb phrase.

(2) a. chele-Ta [or baba aS-be **bole**] Suneche
boy-CF [his father come-will C] heard
'The boy heard that his father will come'
b. *chele-Ta Suneche [or baba aS-be **bole**]
(Bayer 1999: 3)

(3) a. chele-Ta Suneche [**je** or baba aS-be]
boy-CF heard [C his father come-will]
'The boy heard that his father will come'
b. *chele-Ta [**je** or baba aS-be] Suneche
(Bayer 1999: 3)

Clause-final Cs, like *bole*, are derived from verbs of saying. The clause-initial Cs—the ones that put CPs in the right periphery of the clause—are derived from operators of various sorts, like relativizers or *wh*-words.

(4)

Language	final C		initial C	
Bengali	*bole*	pst part *bol-*, 'say'	*je*	relativizer
Oriya	*boli*	pst part *bol-*, 'say'	*je*	relativizer
Assamese	*buli*	pst part *bol-*, 'say'	*je*	relativizer
Marathi	*mhanun*	from 'say'	*ki*	originally 'what'

(Bayer 1999: 3(4))

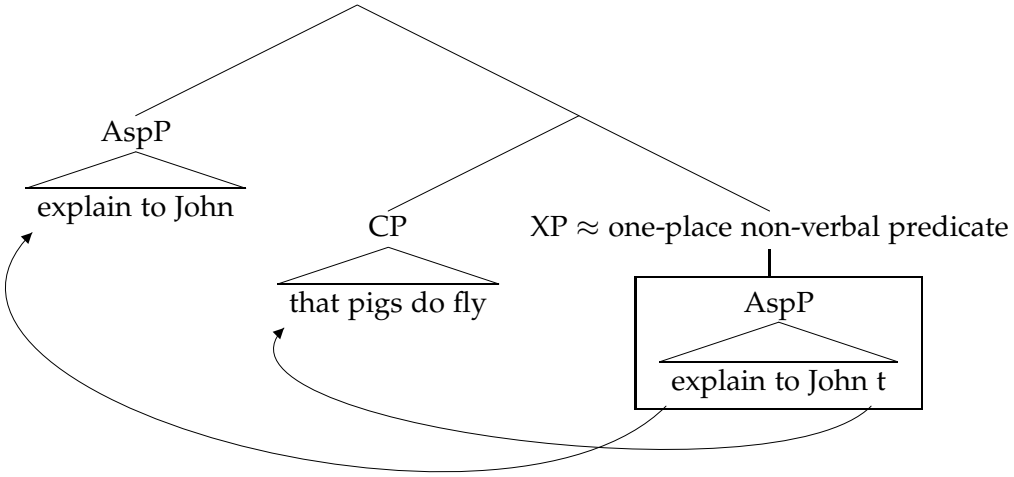
The hybrid system of Bengali is telling of a pattern that can be detected across Indo-European. This paper provides a way of making the connection: the semantic combinatorics of CPs—being like relatives in their inability to saturate verbal predicates—thus explains their distribution in the VP periphery.[2]

Here's how: due to their semantic type, (tensed) CPs can only combine with one-place non-verbal predicates. By this I mean predicates that that have no 'open' eventuality argument. This only allows CPs to combine with nominalizations whose eventuality arguments are 'closed off' in some way, which creates non-eventuality or 'result' nominals and so explains the Higgins-Stowell facts. When it comes to CP arguments of verbs, a different strategy must emerge. That strategy is movement, and the completely

[2]Biberauer and Sheehan (2010) address a similar range of data in the context of the Final Over Final Constraint (FOFC). The present account suggests a different reason why CP headedness determines the external distribution of the CP.

standard effect that movement has on semantic composition (Heim and Kratzer 1998). Two types of movement, we'll see, furnish a one-place non-eventuality denoting predicate: movement of the CP followed by remnant movement of a verbal projection (here identified as Aspect phrase):

(5)



Movement of AspP phrase is what 'takes care' of the eventuality argument (see e.g. Hacquard (2006) for a related move put to a different purpose). The trace of aspect saturates an eventuality argument (which then gets opened up by a lambda abstractor above). What this does is give the CP a phrase of the right semantic to combine with. So at one very specific point in the derivation, the verb phrase has a noun meaning. Movement being leftward, this will ensure that CPs are to the right of Aspect phrase, deriving the rightward position of CPs with respect to verbal material, including aspectual projections.

1.1 The claim and its predictions: an overview

What is derived in (5), in fact, is a remnant movement analysis of CP arguments, one familiar to us from Larson (1988, 1991)'s predicate fronting account of heavy NP shift (HNPS) and recent work by Kayne on CPs (Kayne 2005c). We'll review evidence that this indeed is the *right* syntactic derivation for clausal arguments—as opposed to *in situ* derivations that strand CPs low (Zwart 1993) or rightward movement analyses that move only the CP (Büring and Hartmann 1997). The evidence is that 'extraposed' clausal argument behave like HNPS, not like extraposed relatives or complements of nouns (Stowell 1981).

Besides deriving the basic word order of clausal arguments, a number of correct predictions are made. In §5 we address the positioning of CPs with respect to the verbal cluster (in, for instance, German) and account for the fact that the landing site of CP arguments is variable, something revealed in VP fronting contexts. We'll also explain why clauses cannot move leftward and leave CP-category gaps (Williams 1981; Grimshaw 1982; Webelhuth 1992): the semantic combinatorics simply force AspP to precede any CP (§5.1). Moreover, while HNPS is optional, and so then derivations like (5) invoked for HNPS, the semantic types force such a derivation on CPs (§5.2). Derived as well is

the right roof constraint for clausal arguments (Ross 1967), given the assumption that as a type-repairing operation like QR, the movement of CP (and AspP) is clause-bound. (This is not true of HNPS, and this is what allows those movements to escape tensed clauses, §5.2.1).

The present study also confirms Fox and Nissenbaum (1999)'s thesis that semantic type-fixing operations, such as QR, take place in the overt syntax. QR differs from CP and AspP fronting only in that its lower copy is pronounced (Bobaljik 2002).

Finally, in an appendix, we address the often-cited obstacles—connectivity, extraction—to derivations that move CPs upward. I'll show that the connectivity data tells us very little, to the extent that we know what it tells us at all. And, as with any account that uses movements to derive basic word order (Kayne 1994), conditions on extraction from moved constituents must be relaxed—although various properties of the analysis (and some facts from Müller 1998) mitigate how detrimental the extraction issue is to this proposal in the first place .

2 Clause Positions

It's a well-told fact about Indo-European OV languages that their finite clausal complements (and to some extent their non-finite ones) appear at the right periphery of the VP. This is what distinguishes CP internal arguments from DP and PP arguments (which may or may not appear post-verbally, depending on other factors in the languages).

(6) German

a. daß er gesagt hat [$_{CP}$ daß Claudia Peter geküst hat].
that he said has that Claudia Peter kissed has
'that he said that Claudia has kissed Peter'

b. ??daß er [$_{CP}$ daß Claudia Peter geküst hat] gesagt hat.
(Müller 1998: 166(57))

(7) Farsi (Farudi 2007)

a. Giti fekr mi-kon-e [$_{CP}$ ke man ketāb-ro dust dār-am]
Giti think DUR-do-3SG that I book-RA friend have-1SG
'Giti thinks that I like the book'

b. *Giti [$_{CP}$ ke man ketāb-ro dust dār-am] fekr mi-kon-e

c. man [$_{DP}$ ketāb-ro] [$_{PP}$ be giti] dād-am
I book-OBJ to Giti gave-1SG
'I gave the book to Giti'

CPs can appear to the left of the verb in German[3]—but this blocks extraction, suggesting that these CPs are not in their canonical position here (see below for more about the extraction issue).

[3]Such CPs obey a restriction known to constrain leftward movement of CPs: their traces must be in positions where DPs are licensed (Webelhuth 1992).

(8) a. (Ich weiss nicht) wen$_1$ er gesagt hat [$_{CP}$ daß Claudia t$_1$ geküst hat]
I know not whom he said has that Claudia kissed has
'I don't know who he said that Claudia has kissed'
b. *(Ich weiss nicht) wen$_1$ er [$_{CP}$ daß Claudia t$_1$ geküst hat] gesagt hat.
(Müller 1998: 166(57))

The ungrammaticality (8b) shows, moreover, that it is unlikely that the rightward position of CPs is merely the reflex of extra-grammatical pressures against centre-embedding (see e.g. Kuno 1973).[4] Further, when CPs are embedded within DPs, those DPs can be preverbal. Processing and prosodic factors *alone* cant be responsible for determining clause positions (9):

(9) Wir haben [$_{DP}$ Peters Behauptung [$_{CP}$ daß er zu Hause gewesen sei]]
we have Peter's claim that he at home been was
überprüft.
checked.
'We checked Peter's claim that he was at home.'

Likewise in Farsi, CPs can appear sentence-internally but only if they appear embedded in a DP.

(10) Giti [$_{DP}$ **in-o** ke rahmin mi-*ā*-d emshab] fekr mi-kone-e
Giti this-OBJ that Rahmin DUR-come-3SG tonight thought DUR-do-3SG
'Giti thinks that Rahmin is coming tonight.'
(Farudi 2007)

It is for these reasons—and more below—that we seek a solution in the syntax.

In English, too, we can detect that CP internal arguments appear in a position distinct from complements. Stowell (1981) shows this by restricting our attention to the order of complements in gerundives, where we can be more certain of the canonical ordering of complements.[5] CP arguments, unlike DPs, must appear after other arguments (11), verbal modifiers (12), and even extraposed relatives (13).

[4] In this we might include a prosodic explanation for the position of CPs (Truckenbrodt 1995).

[5] For independent reasons, gerundives appear to block rightward shift—basically, heavy NP shift (HNPS):

(i) a. Paul's having retrieved the cereal box-top from the trash can surprised me.
b. *Paul's having retrieved—from the trash can—the cereal box-top surprised me.
(Stowell 1981: 108(5/6a))

(ii) a. Did [Sally's mentioning her problem to the doctor] surprise you?
b. *Did [Sally's mentioning to the doctor her problem] surprise you?
(Stowell 1981:109(11))

Stowell suggests that because gerunds are factive (his terminology), the shifted object cannot be construed as a 'focussed' constituent. Some delicacy is required for this explanation to rule out DP rightward movement but not CP rightward movement in gerunds.

(11) V PP CP / *V CP PP

a. Did [Sally's mentioning to the doctor that there will be a problem] surprise you?

b. *Did [Sally's mentioning that there will be a problem to the doctor] surprise you?
(Stowell 1981:109(12))

(12) V Adv CP / *V CP Adv

a. Did [Sally's saying quietly that there will be a problem] surprise you?

b. *Did [Sally's saying that there will be a problem quietly] surprise you?

(13) V DP_i PP [Extraposed Rel]$_i$ / *V DP_i CP [Extraposed Rel]$_i$

a. Sally convinced [a man who could fix the problem] of coming.

b. Sally convinced a man$_i$ of coming [$_{Rel}$ who could fix the problem]$_i$.

c. Sally convinced [a man who could fix the problem] that he should come.

d. *Sally convinced a man$_i$ that he should come [$_{Rel}$ who could fix the problem]$_i$.

There are movement analyses and Base(-generation) analyses of clause positions.[6] The 'low' Base analysis—(Zwart 1993) and much work in the antisymmetry vein—strand the CP in argument position to the right of the verb (assuming a VO base), but move other material leftward. The difference, then, between DPs and CPs is that the latter do not move from complement position, perhaps due to a prohibition related to the fact that they do not participate in the case system (Stowell 1981).[7]

The Base analyses (Zwart 1993; Farudi 2007) make a case for leaving the CP in a low, complement position using data from binding and extraction. Arguments in the VP appear to c-command into the CP (binding variables and giving rise to Condition C effects). Moreover, extraction is possible from CP arguments—something true of complements and not rightward moved phrases. It's unfortunate that these have become standard desiderata for analyses of clause positions. The binding data turns out to have very little to do with diagnosing structural positions (Moulton 2013). The relevance of extraction is called into question, too, by Büring and Hartmann (1997) and Müller (1998) (cf. Haider (1993)). These are reviewed in an appendix.

[6]Both analyses are sub-classified: high base generation (Culicover and Rochemont 1990) vs. low base generation (Zwart 1993); right-ward movement (basically, extraposition e.g. Stowell 1981; Büring and Hartmann 1997) vs. leftward CP movement followed by remnant VP fronting (Kayne 2005b,a,c, the present account).

[7]Stowell's Case Resistance Principle (CRP) was put to a slightly different use than it would have to be in an analysis that strands the CP. For Stowell the CRP actually *forced* movement of the CP, because it was coupled with beliefs about making arguments 'visible' for theta-marking (Aoun 1979, Chomsky 1981: 176ff and 336ff). In many respects, the account offered here has the original effect of the CRP: it's the semantic types version of the CRP. But there are deep differences and diverging predictions, primary among which is that our account will correctly force CPs out of complement positions that *aren't* case-marked (e.g. adjectives, unaccusatives), something the CRP struggles with. We also capture what is both similar, and what is different, between CP extraposition and HNPS. See §5.

2.1 CP arguments are more like HNPS than CP extraposition

The derivations that move CP arguments rightward are different from those that 'extrapose' CP relatives and CP complements of nouns. Aside from the fact that argument extraposition is obligatory, there is an interesting freezing effect (Wexler and Culicover 1981) on the verb phrase across which CP arguments move: P-stranding in the VP is blocked (Kuno 1973, Stowell 1981)

(14) a. *Who did you say to that I would buy the guitar?
b. *Who will Andrew disclose to that he is married?
c. *Barry, David admitted to that he burnt the toast.
(Stowell 1981: 208(177))

Rather, pied-piping is required.[8]

(15) a. To whom did you say that I would buy the guitar?
b. To whom will Andrew disclose that he is married?
c. To Barry, David admitted that he burnt the toast.
(Stowell 1981: 208(178))

The P can strand if the internal argument is a DP object rather than a tensed CP:

(16) a. Who did you say a few words to?
b. Who will Andrew disclose his marriage to?
c. Barry, David admitted his error to?
(Stowell 1981: 208(179))

While at no point here will the P-stranding constraint be explained, it does suggest to us what kind of syntax positions CPs. Heavy NP shift (HNPS) also 'freezes' PP complements, as observed by Fodor (1978):

(17) a. *Jim, I said to a few words about his workmanship.
b. *Who will Andrew disclose to his impending marriage with Jane?
(Stowell 1981: 211(185a,b))

These should be contrasted with extraposition from NP—of either complements or relatives—which do not invoke the P-stranding constraint (Kuno 1973)

(18) a. You gave the impression to John that you were happy.
b. Who did you give the impression to that you were happy?

(19) a. You gave the book to John that Mary wanted.
b. Who did you the book to that Mary wanted?

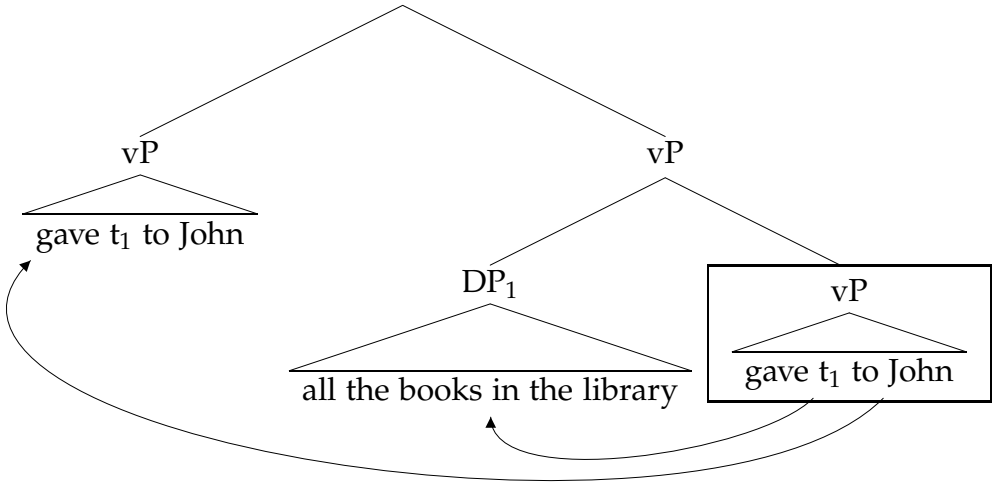
The right-peripheral position of CP arguments to verbs, then must be achieved in the way the HNPS is, not in the way that CP 'extraposition' from NP is (Stowell 1981).[9]

[8] In which case we can't be sure of exactly where the trace of *wh*-movement is.

[9] Like HNPS (Jayaseelan 1990; Takahashi 2004, but cf. Lasnik 1999), CPs can be the remnants of pseudogaps (Baltin 2003):

One account of HNPS is Larson's predicate fronting analysis Larson (1988, 1991), taking up in various ways by Dikken 1995, Kayne 1998) as a form of remnant VP movement.

(20) I gave to John all the books in the library.



In fact, in various works Kayne has argued for just such a derivation of CP arguments (Kayne 2005b, Kayne 2005a, Kayne 2005c). The question such an approach must answer, however, is why such a derivation is optional for HNPS but not for clausal arguments (among other differences, which we discuss below). This is what we answer—showing that the semantic types force the syntactic derivation. It is through nominalization that we learn about the semantic types of CPs.

3 The Higgins-Stowell Facts

When clause-taking predicates are nominalized, they don't refer to the eventuality described by the verb, but often to the thing "verbed" (Higgins 1972).

(21) Paul's explanation/claim/observation/belief that he was temporarily insane.

(22) Paul's explanation/claim/observation/belief **was** that he was temporarily insane. (Stowell 1981: 199(154))

The copular relation (here 'specificational' or 'equative') in (22) shows that what the nominalization describes so too the CP. And what the nominalization describes is not an

(i) Although John wouldn't complain that he's angry, he would that he's tired. (Baltin 2003: 225(ft.6))

And (for reasons that are relevant in distinguishing CP movement from DP movement—see §5.1) *complain* is a verb that doesn't select DPs, to the trace left by this movement must be a CP-category trace. Since CP complements can be elided under VP ellipsis, we must assume that the ellipsis site in pseudo-gapping can be slightly smaller than that in VPE. Or that CP positions are variable in the right edge of the VP, as shown in §5.

event of explaining but an (abstract) thing that has some explanatory content. These and a range of related observations I call the Higgins-Stowell facts.

The true nature of the Higgins-Stowell facts can only be appreciated with Jane Grimshaw's discoveries. When verbs are nominalized they can describe a range of things (Grimshaw 1990). A nominalization can describe the eventuality (state or event proper) in the same way as its parent verb does. These are complex eventuality nominals (CENs)—the *complex* part will be important in a bit. That CENs describe eventualities is shown by the VPs they are predicated of: eventualities *take place* in temporal space. Another kind of nominalization creates non-eventuality nominals (NENs), which describe a variety of things related to the verb: a participant of the verb (e.g. an object as in *a belief, an assignment*), a result state (*the destruction*), or a related concrete object (*an examination*). The VPs of which NENs are predicated illustrate their meanings.

(23) a. Fred's **assignment** of this task took place at noon. CEN
b. Fred's **assignment** was to fix the sink. NEN

(24) a. The Roman's **destruction** of the city took place early on in the war. CEN
b. The **destruction** was widespread. NEN

(25) a. **Examination** of students must occur at the end of semester. CEN
b. The **examination** was on the table. NEN

Now Grimshaw's important discovery was that CENs unlike NENs require their internal arguments (like their verbal counterparts). Grimsahw uncovered this generalizations by finding various ways to independently disambiguate the nominal.

One kind of disambiguating tool Grimshaw makes use of involves aktionsart modifiers. The first thing to know is that CENs, but not NENs, show the same aktionsart distinctions as their associated verb phrases (Vendler 1967, Dowty 1979). So *destroy/uction+NP* is telic (allowing *in*-phrases but not *for*-phrases). The reverse holds for *observe/ation*+NP.

(26) a. The Romans destroyed the city in three hours/*for three hours.
b. The doctor observed the patient for three hours/*in three hours.

(27) a. The total destruction of the city in two days/*for two days appalled everyone.
b. Only observation of the patient for several weeks/*in several weeks can determine the most likely [course of action].
(Grimshaw 1990:58(28b/29b))

But the internal argument must be present for the aktionsart modifier to be. Or, put another way, CENs must have their internal arguments saturated.

(28) a. *The total destruction in two days was widespread.
b. *Only observation for several weeks can determine the most likely [course of action].

According to this diagnostic, CP-taking predicates cannot form CENs. Grimshaw's minimal pair with DP- vs. CP-taking *observe/ation* illustrates the striking contrast.[10]

(29) DP-taking *observation*
  a. We observed the butler for several weeks.
  b. Observation of the butler for several weeks is needed.

(30) Clause-taking *observation*
  a. They observed [that the butler was likely the killer] for several weeks.
  b. *Their [observation [that the butler was likely the killer] for several weeks] was not supported by evidence.
  c. cf. Their observation that the butler was likely the killer was not supported by evidence.

The use of *observe* that takes a clause only has an non-event nominalization. This is an entirely systematic property of CP-taking predicates when nominalized (whether by zero-derivation as *claim/belief* or with various kinds of overt nominalizing morphology). The modifiers in (31) are to be interpreted high, modifying the event described by the embedding noun. The possible garden-path effect here has been countered by choosing embedded VPs that are incompatible with the modifier or simply placing the modifier before the CP.[11]

(31) a. I decided that he was a fraud **in 5 minutes**
  b. *My decision that he was a fraud **in 5 minutes**

[10]Grimshaw includes in her diagnostics for event nominals adjectival modification by *frequent* and *constant* of singular nouns (*the frequent expression of one's feelings* vs. **the frequent expression*). Grimshaw gives (i) as evidence that these adjective can't combine with CP-taking nouns. But Pesetsky and Torrego (2002) prsent (ii) and (iii), which shows that the presence of the CP is necessary to license the adjective, something we'd expect if those CPs were true arguments (Ogawa 2001).

(i) a. *Their frequent/constant announcement that they were the greatest eventually became tiresome.
  b. *His frequent/constant statement that he was about to resign was intended to mislead. (Grimshaw 1990: 75–76)

(ii) a. His frequent/constant claim that he was about to resign annoyed us.
  b. *His frequent/constant claim annoyed us. (Pesetsky and Torrego 2002)

(iii) a. The constant belief that someone is trying to poison you is a sure sign of insanity.
  b. *The constant belief is a sure sign of insanity. (Pesetsky and Torrego 2002)

It's not clear that we understand these adjectival modifiers to the same extent that we do aktionsart modifiers (cf. *the constant party next door*). It is for this reason we rely more heavily on the aktionsart diagnostic. Perhaps these adjectives diagnose *simplex* event nouns, a third category delineated by Grimshaw.

[11]You'll note that in the verbal cases, the aktionsart modifier can follow the CP. This will turn out to be predicted by the analysis. Above the CP, our analysis has a node that describes a property of event(ualities). The PPs can right-adjoin to this node and thereby follow the CP. It's as good a time as any to say that while some anti-symmetric ideas inspire this paper, the account does not require any ban on rightward movement and rightward adjunction. In fact, we could just as easily allow the CP to move right.

c. *My decision **in 5 minutes** that he was a fraud

(32) a. Blogs suggested that he fathered a child in 1992 **for years**
b. *The suggestion that he fathered a child in 1992 **for years**
c. *The suggestion **for years** that he fathered a child in 1992

(33) a. John proved that he was competent **in only a few minutes**
b. *John's proof that he was competent **in only a few minutes**
c. *John's proof **in only a few minutes** that he was competent

(34) a. I explained **in under an hour** that I was innocent.
b. *My explanation that I was innocent **in under an hour**.
c. *My explanation **in under an hour** that I was innocent.

(Incidentally, that *proof* is a NEN means that our analysis is immune to those criticisms levelled against Stowell's (1981) apposition analysis of CPs in NPs.[12]) Activity-denoting CP-taking predicates have to be handled with a little more care. The first thing to know is that with many such verbs we get a 'repeated events' interpretation when a *for*-phrase is added. So (35a) is true if there were several, repeated claiming events by John over a two year period. In principle, this interpretation should be available with the nominalization in (35b), but it is not. In fact, the form is unacceptable.

(35) a. John claimed **for two years** that the earth was flat.
b. *John's claim **for two years** that the earth was flat.

(36) a. Blogs suggested that he fathered a child in 1992 **for years**

[12]The nominalization of *prove* is often cited as a counter-example to the claim that CP complements of nouns are not arguments. Actually, *proof* is a "subject" nominal. It describes the thing that does the proving that can be identified with the noun *proof*, not the conclusion (ib).

(i) That John's coat is gone proves that he left.
a. $\neq$ The proof is that he left.
b. $\approx$ The proof is that John's coat is gone.

We've already seen good evidence that the CP does not combine with *proof* by saturation given that *proof* cannot form a CEN (see (33)). Why this predicate, when nominalized, makes its internal argument available to CP modification but nonetheless *describes* its external argument is simply a mystery that goes beyond our current knowledge of lexical and morpho-semantics. Likewise, the nominalization *demonstration* is thought to be a counter-example (Pesetsky and Torrego 2002). Note, too, that it is not a CEN (see (39)).

Another counter-example involves the noun *knowledge*, which Grimshaw (1990) claims does not allow the CP in post-copular position:

(ii) *The knowledge was that Dukakis was ahead. (Grimshaw 1990: 98(122a))

Some naturally occurring examples, however, suggest that *knowledge* is not a counter-example:

(iii) a. Our current knowledge is that light exhibits a dual nature or behavior.
b. My limited knowledge of returning missionaries was that they were basically hands off until they were "debriefed"; is this unusual?
c. My only knowledge of it was that there was an image of it on a punt coin at some stage. The first thing that struck me was how modern it was.

b. *The suggestion that he fathered a child in 1992 **for years**

This isn't just a property of these particular predicates. Nor is it some deep incompatibility between the meanings of these predicates and event nominalization. Some DP and CP-taking verbs (not all, of course, but some) can form event nominalizations with their DP objects (expressed in *of*-PPs)—even those DP arguments that bear the same relation to the verb that the CP appears to. But no CP is allowed.

(37) a. Lisa explained the problem in two minutes flat.
b. Lisa's explanation of the problem in two minutes flat (impressed me).
c. *Lisa's explanation that there was problem in two minutes flat (impressed me).

(38) a. John suggested that possibility for so many years.
b. John's suggestion of that possibility for so many years (got tiresome)
c. *John's suggestion that he father a child for so many years (got tiresome).

(39) a. John demonstrated that he was a skilled pianist *in just a few short minutes*.
b. *John's demonstration *in just a few short minutes* that he was a skilled pianist.
c. cf. John's demonstration of his skills in just a few short minutes.

Nominalizations that take CPs just cannot form complex eventuality nominals. The explanation turns out to be very straightforward given one hypothesis: like relative clauses and unlike arguments, CPs do not saturate. We'll see how this works and then offer corroborating evidence for it.

3.1 An explanation for the nominalization facts

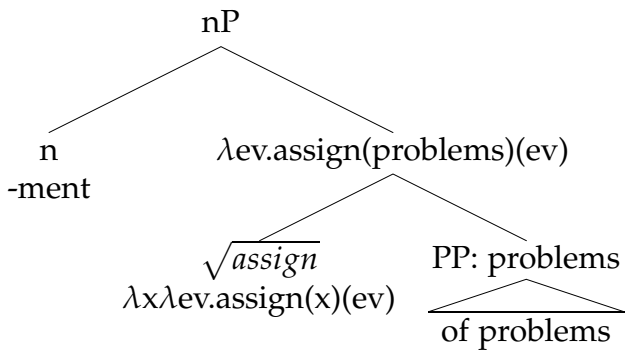
What we've learned from Grimshaw is that CENs must have their internal arguments saturated. CP-taking nouns can't be CENs and that, we contend, is because CPs can't saturate. The only option is to form a non-event nominal. Before turning to why CPs don't saturate, some basics about the formation and of event, and non-event, nominals.

As is standard, transitive (verb) roots have an internal argument and an event(uality) argument (in the sense of Bach (1986), so as to include states, described by verbs or adjectives, and events proper; I'll use *ev* as a variable for eventualities, with the understanding that this will include states too. Everything I say should extend to adjectival predicates).

(40) $\sqrt{assign} = \lambda x.\lambda ev.\text{assign(x)(ev)}$

The external argument is added by a separate head, v (Chomsky 1995, Kratzer 1996). A CEN is formed by saturating the internal argument, giving a predicate of events. (n is the nominalizing head, Marantz 2001.) The preposition *of* is semantically vacuous.

(41)



This nP denotes a set of events of assigning problems, and that is exactly what it seems to describe in (42). And we can imagine that a determiner, say *the*, may combine with properties of events just as it does with properties of individuals.

(42) a. Assignment of difficult problems should take place early in the semester.
b. The assignment of difficult problems should take place early in the semester.

CENs, then, are formed just like a verb phrase but with the help of nominal morphology can then combine with the determiner system.

Non-event nominals (NENs) take a different compositional path. Recall that many non-event nominalizations describe the thing that their parent predicate's internal argument does:

(43) a. He was assigned to fix the sink.
b. The assignment was to fix the sink.

(44) a. He explained that he was innocent.
b. His explanation was that he was innocent.

(45) a. They observed that it was falling apart.
b. Their observation is that it was falling apart.

While the range of things that NENs can describe is heterogeneous and unpredictable (see (23)– (25)), we do know that they don't describe an the eventuality described by their parent verb.[13] How do we know this? Because that eventuality argument is not available for modification, particularly by aktionsart modifiers. The reason for this is simple: in NENs the eventuality argument is existentially closed off (Salanova 2010), and this must be done so 'low' in the tree that the eventuality argument is not available to certain modifiers. I'll use ∃ in the object language to signal existential closure of the event argument.[14] In the simple case, this will give rise to the variety of NEN known

[13]They may even describe a 'simple' eventuality, in Grimshaw's terms, but not one that aktionsart modifiers can combine with.

[14]Leaving open how that is operationalized. You can think of ∃ as a functional head with the following denotation:

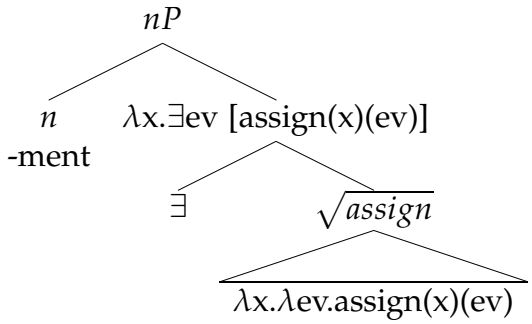
(i) $[\![\exists]\!] = \lambda P.\lambda x.\exists ev[P(x)(ev)]$

There are other ways to say this, and there are questions about how this head is distributed and constrained.

as an object nominal—those NENs that describe what their parent verb's object usually does. The NEN of *assignment* makes a good example:

(46) One of the assignments was to fix the sink.

(47)



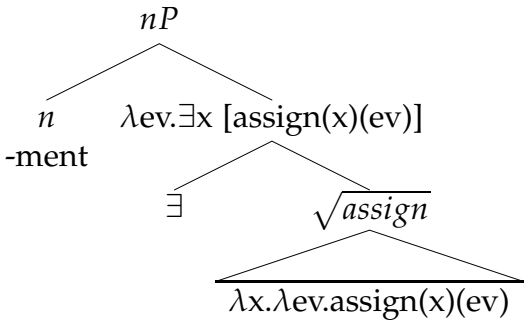
(47) captures just what the nominalization in (46) means: a set of things such that there was an event of assigning them.[15] We predict correctly that non-event nominals won't allow their internal argument to be saturated:

(48) *The assignment of the problem is on the table.

If the internal argument were saturated, you wouldn't derive the required NP meaning for *assignment*—you'd get a truth value, not a common noun phrase meaning.

What is not possible, given what we've learned from Grimshaw, is to somehow 'close-off' an internal argument, letting a nominalization denote an event but be happy to go without its internal argument.

(49) Not possible:



What rules this out is basically some suitably subtle version of the theta-criterion, relativized to functors with eventuality arguments: verbs, adjective phrases, and complex event nominals.[16]

[15]Not all NENs carry the entailment of the existence of an event in this way. The resolution to this problem is difficult and likely hinges on a better understanding word formation semantics. One resolution would be to somehow 'add' eventuality arguments (say via a light *v* that takes roots that describe 'things', making these all denominal verbs—not my preference). The other is to derive NENs from different roots than their associated verbs, but we'd have to give up certain popular ideas about word formation.

[16]Alternatively, we could think of the presence of ∃ as being determined by the nominalizing morphology—perhaps bundled with it. In that case, there would be selectional restrictions on what ∃ binds (so, events, not individuals). It's natural to think that just nominalizers like *-ment/ation/etc.* select

3.2 What CPs *do* do[17]

Now, when it comes to CPs, the hypothesis is that they do not saturate argument positions. (We'll soon see that they merely restrict argument roles.) Since they cannot saturate argument positions—and since event nominals can only be formed if their internal arguments are saturated—CPs will never be able to appear with event nominals, as observed.

There is, in fact, a very straightforward argument that CPs do not saturate nouns. CPs can appear with nouns that have no arguments to begin with! Nouns can, in general, take DP arguments as long as case is made available, with a preposition. This can be seen for de-verbal nouns in (50) and relational nouns in (51):

(50) a. John's repetition of his claim
b. the Romans' destruction of the city

(51) a. The niece of one of my friends (is nice).
b. The capital of Wisconsin (is a friendly place).

It is not possible, however, to replace the CP complements of some nouns with a DP—even with the help of a preposition. This is true for non-derived nouns, as in (52a).[18]

(52) a. *I don't believe { the idea, story, notion, theory, scoop, myth } of that.
b. I don't believe { the idea, story, notion, theory, scoop, myth } that Edna left.

And it is true of many derived nominals: the verbs in (53)–(55) take DP internal arguments but their object nominalizations cannot (Zucchi 1989).

(53) a. *John's belief of that idea.
b. John believed that idea.

(54) a. *John's claim of something.
b. John claimed something.

(55) a. *Her thought of that.
b. She thought that.

These are object (NEN) nominalizations, of course, and we've re already seen why these are not internal argument-takers. This then is an existence argument for CPs that don't to saturate nouns.

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for eventuality-denoting roots and their bundled ∃ could place restrictions on the variable they bind. In fact, this is precisely what's encoded in footnote 14. The relation to Heim-style existential closure and the range of Diesing-style effects may or may not be relevant.

[17]The following is based on Moulton 2009, 2013.

[18]To the extent that speakers allow such PPs to surface, the DPs inside them do not correspond to the propositional argument of the predicate but often to what the propositional content of the myth/story/idea is about:

(i) The myth/claim/story of that/his birth/that event is that it was a hoax.

See Moulton (2013) for the role of so-called *res* arguments in nouns.

The idea that CPs don't saturate the nouns they appear with goes back to at least Higgins (1972) and Stowell (1981). As noted, Higgins (1972) and Stowell (1981) were the first to record the intuition that CPs in post-copular position can sometimes even explicitly *identify* the content of the noun (see footnote 12 on the counter-examples). The copular relation here is specificational—or "equative" as Potts (2002) terms it—not predicational.

(56) a. The rumor that Edna was stealing (is false).
b. The rumor is that Edna was stealing.

(57) a. The fact that Edna was stealing (is apparent).
b. The fact is that Edna was stealing.

(58) a. The belief that Edna was stealing (is false).
b. The belief is that Edna was stealing.

(59) a. Andrea's guess that Bill was lying.
b. Andrea's guess was that Bill was lying.

(60) a. John's claim that he would go.
b. John's claim was that he would go.

(61) a. Paul's explanation that he was temporarily insane.
b. Paul's explanation was that he was temporarily insane.
(Stowell 1981: 199(154))

As Grimshaw (1990) shows, true arguments cannot be separated from their selecting nouns like this, across a copula. To make this point, Grimshaw contrasts genitives in two roles. In (62), the genitive is possessive (hence, in Grimshaw's system, a modifier). It can be post-copular.

(62) a. John's dog.
b. The dog is John's (Grimshaw 1990: 97(118a))

The genitive in (63), on the other hand, is an argument—this construction being a passive nominal. This genitive cannot occur in post-copular position.

(63) a. The building's construction.
b. *The construction was the building's. (Grimshaw 1990: 97(121b))

Arguments cannot appear in post-copular position. Since clausal complements of nouns *can* appear in post-copular position, they are not arguments.

So there are at least two instances in which we know independently that CPs do not saturate argument positions: when they appear with non-derived nouns and object nominalizations (NENs) and when they appear in an equative copular construction. This is the corroborating evidence that our solution to the absence of CENs with CPs is correct: CPs *never* saturate, and that's why the can't appear with CENs.

I know of at least two worked-out semantic proposals that capture the non-argument status of CPs that appear with nouns. Both Potts (2002) and Kratzer (2006) treat CPs,

when they combine with nouns, as restricting rather than saturating.[19] Here I follow Kratzer, and the development of her proposal in Moulton (2009) and Moulton (2013).

Non-derived nouns like *myth* and *story* denote individuals of a particular sort—those with associated propositional content. These kinds of individuals will be notated by x_p—a thing with propositional content.[20]

(64) $[\![\textit{story}]\!]^w = \lambda x_p[\text{story}_w(x_p)]$

A *that*-clause identifies the propositional content of such a content-bearing individual. First, we define a function that allows us to talk about the content of a particular rumor or belief as a set of possible worlds—worlds compatible with the content of the information-bearing individual.

(65) $\text{fcont}(x)(w) = \{ w' : w' \text{ is compatible with } x \text{ in } w \}$

The next step in Kratzer's proposal captures how the CP identifies the content of these nouns. Kratzer proposes that a functional head that embeds the clause does this. This head, C,[21] incorporates the function in (65). It takes a propositional argument (type $\langle s,t \rangle$), an individual argument (x_p) that is something that has propositional content, and the usual world of evaluation argument.

(66) $[\![C]\!] = \lambda p.\lambda x.\lambda w\ [\text{fcont}(x)(w) = p\ ]$ (*after* Kratzer 2006)

C says that the content of some individual is the proposition that C embeds. This accords with our intuitions that in (67)

(67) The rumor that Bob is a fraud

the content of the rumor is just the proposition that Bob is a fraud.[22]

(68) $[\![\text{that Bob is a fraud}]\!]^w =$
$\lambda x_p.\text{fcont}_w(x_p) = \lambda w'.$ Bob is a fraud in w'

The CP then combines with the content noun by predicate intersection.

(69) $[\![\textit{story that Bob is a fraud}]\!]^w =$
$\lambda x_p\ [\text{story}_w(x_p)\ \&\ \text{fcont}_w(x_p) = \lambda w'.$ Bob is a fraud in w']

[19]The difference is in whether the basic type of CPs is type *e* or $\langle e,t \rangle$. There are arguments on both sides (see Moulton 2009), but the evidence from the ban on CENs motivates the predicative denotation.

[20]There's been a recent move toward projecting (modal) alternatives from particulars, i.e. individuals, events, situations, information repositories (Hacquard 2006; Kratzer 2009).

[21]I'll remain agnostic as to whether C is the complementizer *that* or some other functional head.

[22]The content of the noun is identified, uniquely, with the proposition because otherwise we would expect recursive addition of propositions, giving rise to "stacked" CPs after content nouns (which is not possible, and hence why most people have considered them arguments). The present formulation requires that the content of noun *is* the associated proposition, which ensures that further adjoined propositions would be identified with all other adjoined propositions. Outside of mathematical statements, for which a possible worlds semantics has difficulty anyway, this correctly prevents "stacking" CP complements to nouns. That is, **the rumor that Bob is a fraud, that Bob has red hair* would identify the two CP propositions, which is impossible since they are not the same proposition.

An adequate paraphrase, one that capture the likeness to relative clauses, is the following:[23]

(70) The rumour that Bob is a fraud
≈ The rumour *whose content is* that Bob is a fraud

We can make the same move with nominalizations. Clause-taking verb roots select content arguments (Kratzer 2006):[24]

(71) a. He believed the story
b. I understood your idea.
c. I explained her claim.

(72) $[\![\sqrt{explain}]\!]^w = \lambda x_p.\lambda ev$ [$explain_w(x_p)(ev)$]

(From hereon I won't show the world of evaluation parameter, although it's of course crucial.) Given the denotation for CPs (68), the compositional options, however, are restricted. A root like *explain* can form a NEN, in which case the eventuality argument is closed off. This returns a property of 'things explained' which the CP can then restrict.[25]

[23]Kayne (2009) and Arsenijevic (2009) actually postulate a gap corresponding to something like this meaning, a predicate of which they derive by relative operator movement. Caponigro and Polinsky (2011) offer morphological evidence for such a gap in complement declarative clauses (among others) in Adyghe. In the present account there is no such gap or relativization operation, but the net result is a predicative meaning.

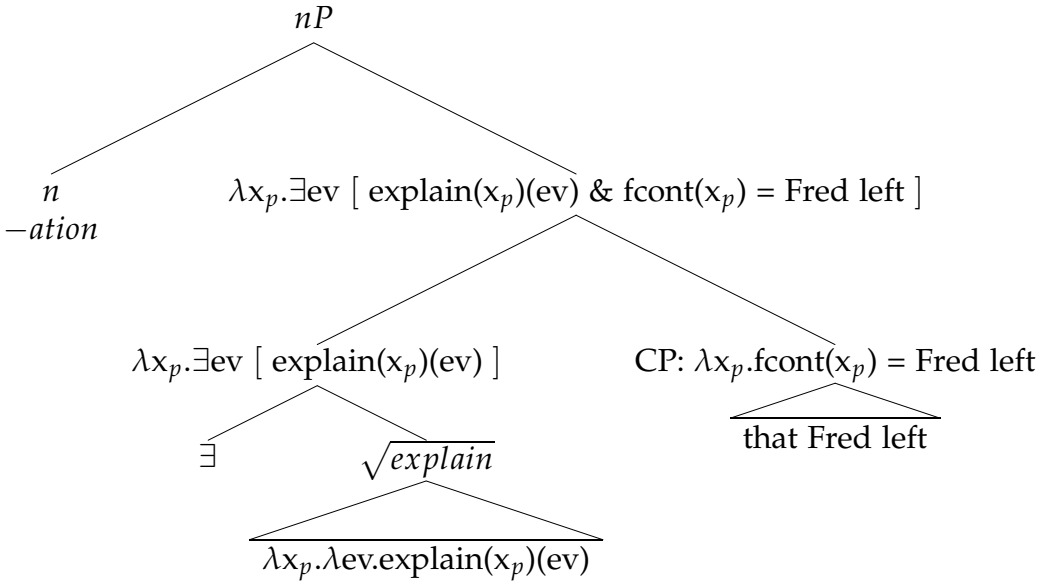
[24]Of course, we typically think of these verbs as selecting propositions, not *things* with propositional content. The difference between these is beyond the scope of this paper. Suppose a verb like *believe* has the following denotation:

(i) a. $[\![believe]\!]^w = \lambda x_p \lambda y_e$. Dox(x)(w) $\subseteq$ fcont(x_p)(w)
b. Dox(x)(w) = { w' : w' is compatible with what x believes in w }

Or, we could simply let CPs denote properties of propositions, keeping a more familiar semantics for attitude verbs, and this would still force them to combine via some other mechanism than saturation. One may also wish to consult Chierchia (1984)'s notion of a propositional correlate.

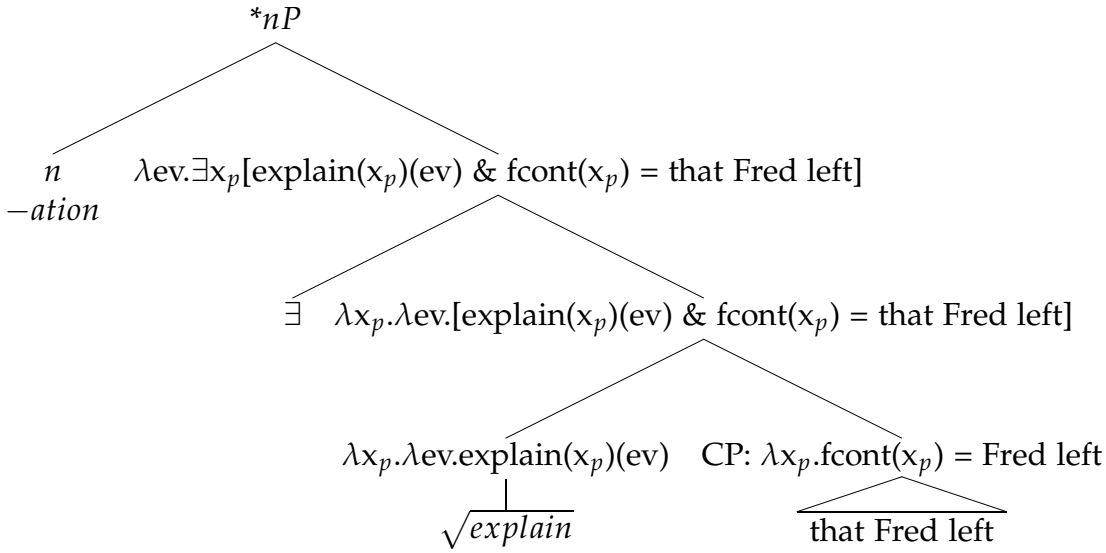
[25]See Moulton (2013) for evidence from binding and counter-cyclic adjunction that these CPs are indeed restrictors, not arguments.

(73) explanation that Fred left.



But *explain*+CP cannot form a CEN. Since the CP cannot saturate, we get an illegitimate output if we don't close off the eventuality argument. That is, if we restrict ourselves to a limited set of modes of composition (intensional functional application and predicate modification), the CP cannot combine with the root. The only legitimate outcome would have to allow the composition shown in (74). Now Chung and Ladusaw (2004) argue for just such a mode of composition, *restrict*, which allows predicates to combine like this and then undergo existential closure. But *restrict* can't be available here. If it were we'd expect complex event nominals that don't require internal arguments, contrary to fact.[26]

(74)



Derided as it is among those of us who've learned about lambdas, some version of the

[26]This is not to say *restrict* doesn't apply in certain cases, like property-type NPs, but as Chung and Ladusaw show this compositional mechanism is signalled by particular morphemes.

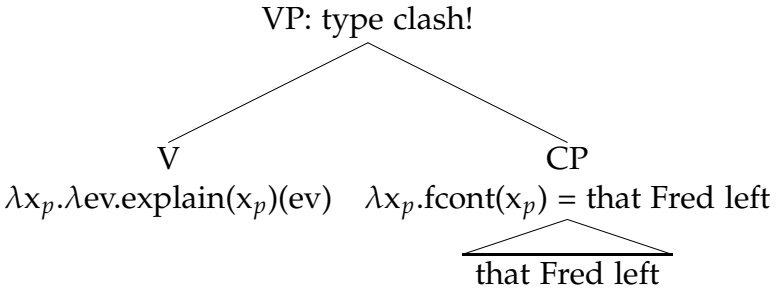
theta-criteria relativized to event-denoting phrases must be assumed.

This then is the solution to the absence of CENs that host CPs: because CENs *must* have their (non-event) arguments saturated, and CPs do not saturate, no CEN can be formed. CPs just can't saturate arguments, at least not if there is an eventuality argument hanging about. CPs can only combine with other properties of individuals, and this what forces NENs.

(75) CPs can only combine with one-place, non-verbal (i.e. non-eventuality denoting) predicates.

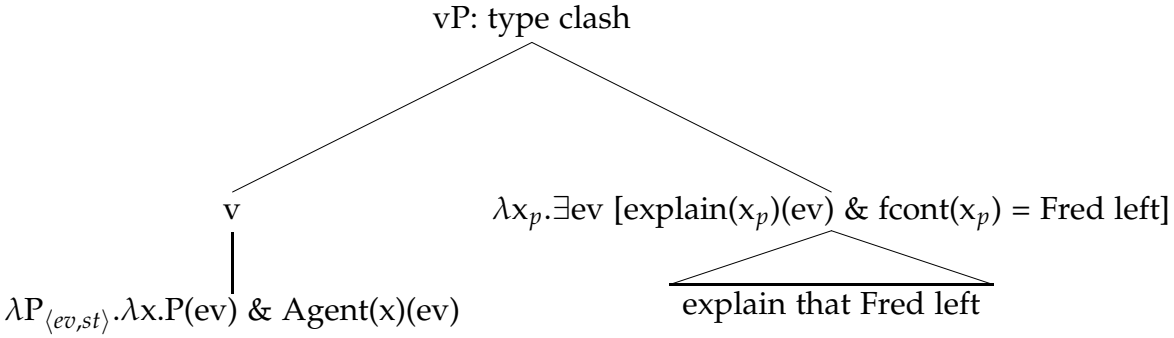
Here's what's important though: for this solution to have any bite, we must conclude that CPs *never* saturate. In particular, CPs must not be able to saturate a verb's argument position. The same type-clash arises here as with CENs:

(76)



The thing we know that CPs can do is combine with other properties of individuals by predicate intersection. This is why NENs combine with CPs: in that case ∃ closes off the eventuality argument and we have a property of individuals (73). Of course, this can't be what happens in the verbal domain: verb phrases describe eventualities. And for a VP to combine with further verbal functional projections that are present in the clause, the eventuality argument must be available. So, for instance, VPs may combine with v heads that introduce external arguments. But in order do so they must be properties of eventualities, given the meaning of v/voice (Kratzer 1996).[27]

(77)



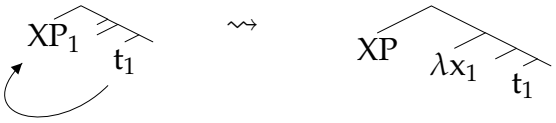
There is another way to manufacture the right semantic type for CPs to combine. It's movement. And not just movement of the CP (that's just Stowell's idea). We'll lift

[27]Kratzer postulates a mode of composition called event identification to keep the types low. I give v a higher type. This is to be consistent with my claim that we keep the modes of composition available restricted, a guiding idea in the story I told above.

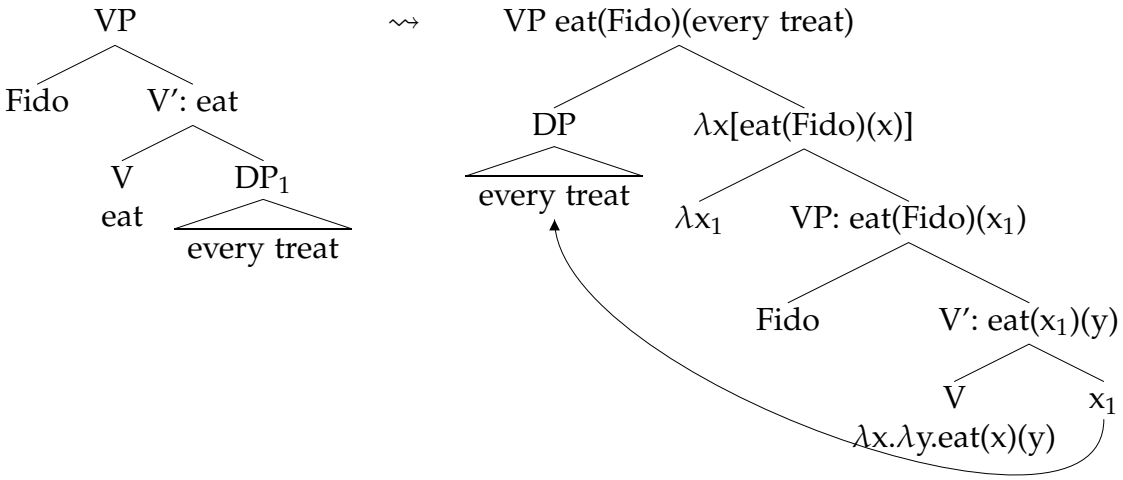
verbal material, too. The well-studied, standard effect that movement can have on semantic types will deliver a convergent derivation—one that is exactly consistent with the derivation defended in §2.1—remnant VP fronting.

4 Deriving CP positions

Movement can have semantic consequences. Putting aside complications that arise under the copy theory of movement (see §4.2), the co-indexed trace of a moved term can be interpreted as a bound variable (Heim and Kratzer 1998). In the semantic component, this variable is bound by a lambda-expression, itself generated as the immediate daughter to the projection that is sister of the moved term:

(78) 

The sister to the moved XP will be interpreted as a function taking as its first argument things of the same type as the trace t_1. Quantifier raising provides a familiar example. On the assumption that generalized quantifiers cannot compose in the object position of transitive verbs,[28] they must move to a position where they can be interpreted. Their traces saturate the object position and movement creates a lambda-abstract—a predicate. This is what QP can combine with.

(79) 

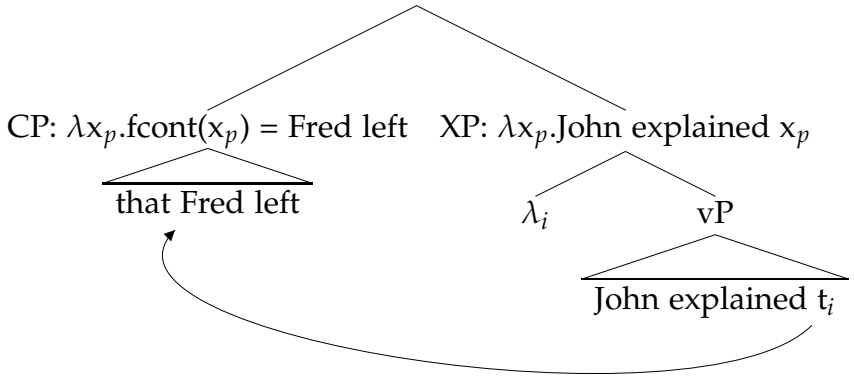
A phrase can leave a trace of a different semantic type, usually the lowest type compatible with the position.[29]

It would be surprising if movement that repairs type mismatches is not generally and freely available. It is not surprising, then, that CPs move leftward and leave a trace of the lowest type compatible with their context—type x_p. (§4.1 explains why this movement is overt, unlike QR.) A lambda-abstract is created just below the landing site:

[28]This is just a demonstration of type-fixing movement; on a view that severs the external argument (ahem), quantifiers in object position do not give rise to a type-clash.

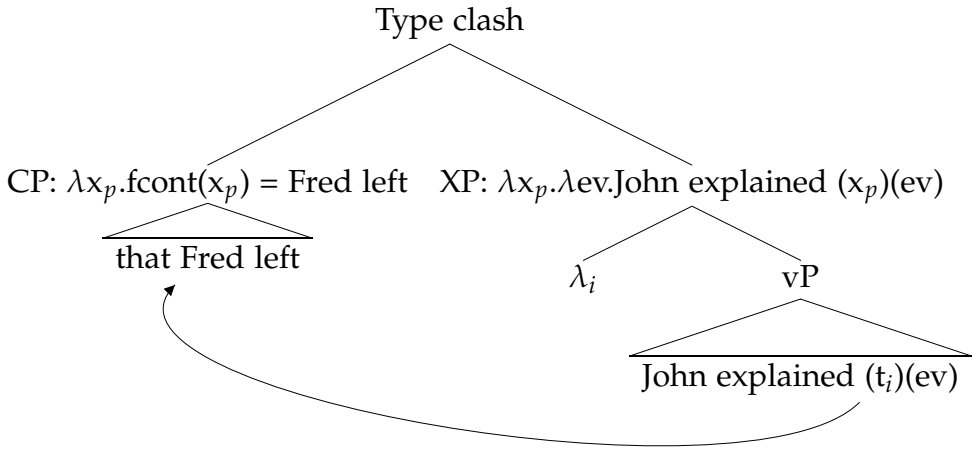
[29]The copy theory of movement requires, of course, some complication to this picture. See §4.2 on how this fits well with Fox (2002)'s trace conversion (see also Sauerland 1998).

(80)



The reader will note, however, that this movement alone does not repair a type mismatch. We've just derived the same type as the verb root.

(81)



(81) violates the principle we derived by examining nominalization, repeated from (75) above:

(82) CPs can only combine with one-place, non-verbal (i.e. non-eventuality denoting) predicates.

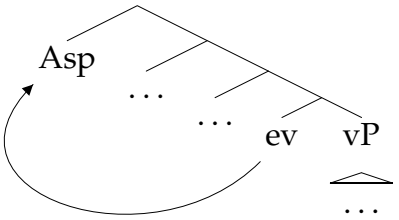
Further movement needs to happen to accommodate a CP.

In the verbal projection, the head that combines with verb phrases and "takes care" of the event argument is Viewpoint Aspect (Smith 1991). Viewpoint Aspect, or just Aspect, is a quantifier over events . It locates the (running time of an) event (ev) with respect to a reference time, t. Here are some standard denotations for aspectual heads of different values (Kratzer 1998).

(83) a. $[\![\text{ perfective }]\!] = \lambda P_{ev,t}.\lambda t.\exists ev[P(ev) \,\&\, \tau(ev) \subset t]$
b. $[\![\text{ imperfective }]\!] = \lambda P_{ev,t}.\lambda t.\exists ev[P(ev) \,\&\, \tau(ev) \supset t]$

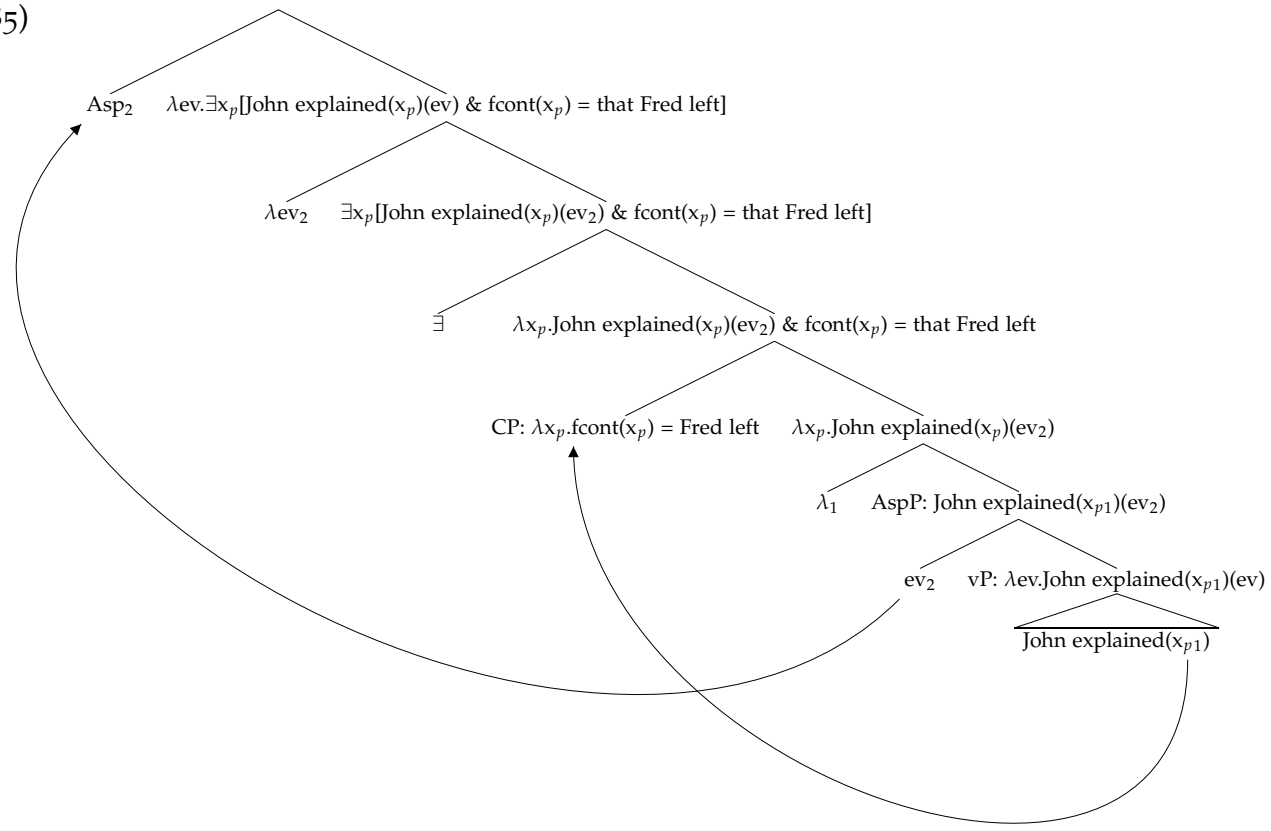
We expect that like other quantifiers, Aspect can move. And when it does so it will leave a trace that is of the type of an event (ev). (See Hacquard 2006 and relevant references for a related move with aspect, treated as an argument of the verb that QRs.)

(84)



The trace saturates the event argument. Combine this with CP movement, and abstract judiciously in the right places, and we get the one-place predicate we're looking for so that the CP has a spot to compose. We allow existential closure (to close off the content argument). Just below the landing site of Asp, due to the lambda-abstraction triggered by the latter's movement, we've got a property of events—a verbal meaning again. Whatever value of Asp has (83), it once again has a property of events to combine with.

(85)



4.1 Why all of AspP moves

You'll note that what has been derived is movement of an aspect head, not movement of a whole phrase that contains all of the verbal material. This was the result advertised in the picture in (5). And there's another pressing question: why are these movements, which serve to repair type clashes, overt? The most familiar case of type-repairing movement is QR, a classic example of covert movement.

Both these concerns—the overtness and the phrasal nature of the movement—are allayed by recognizing a more recent view about movement that repairs types.[30] Fox and Nissenbaum (1999) argue for 'overt QR'. That is, QR can be interleaved with overt operations, such as merge. Fox and Nissenbaum's primary evidence is Williams's generalization. Williams's generalization is that when an adjunct is extraposed from some DP (the "source DP"), the scope of that DP is (at least) as high as the attachment site of the adjunct (Fox 2002: 71(19)). Williams's generalization is illustrated in the following contrast. In (86a), the indefinite can scope above the *before*-clause—reporting that there is a book that you and I read. Another interpretation allows that you and I read different books, in which case the ellipsis site contains a distinct existential quantifier over books than its antecedent. In (86b)—where the relative is extraposed past the *before*-clause—the low interpretation is unavailable.

(86) a. I read a book that John had recommended before you did. *a* >/< *before*
b. I read a book before you did that John had recommended. *a* >/*< *before*

On the Fox-Nissenbaum analysis, this connection is captured by letting the relative counter-cyclically merge (Lebeaux 1988) to a silent, higher copy of the the source DP. And this silent higher copy is the result of QR in the overt syntax. This is why the locus of the relative reveals the QR'd position of the quantifier.

(87) a. 'Overt' QR of source DP
I [read a book before you did] [a book]

b. Late-merger of relative
I [read ~~a book~~ before you did] [a book [that John had recommended]]

On this view, then, what makes QR covert is just a PF instruction to pronounce the lower copy (Bobaljik 2002). The relative can be merged to the higher copy and be pronounced there. There is good reason, then, to think that movement to repair type clashes can occur in the overt syntax. English has the following language-specific spell out rules, with AspP and CP included now:

(88) Spell out rules (English)
a. QR chain: PF spell out the lower copy
b. *wh*-chains: PF spell out higher copy

[30] Technically, we should make a distinction between movement for type-repair (short QR) and movement for scope shifting. Fox and Nissenbaum only make the case for overtness from scope shifting QR. I've extended it to type-repairing QR.

c. AspP chains: PF spell out higher copy
d. CP chains: PF spell out higher copy

If Asp movement is like other overt movements, such as *wh*-movement, we except it to move not just the relevant head—the *wh*-word or the Asp head—but the whole phrase.[31]

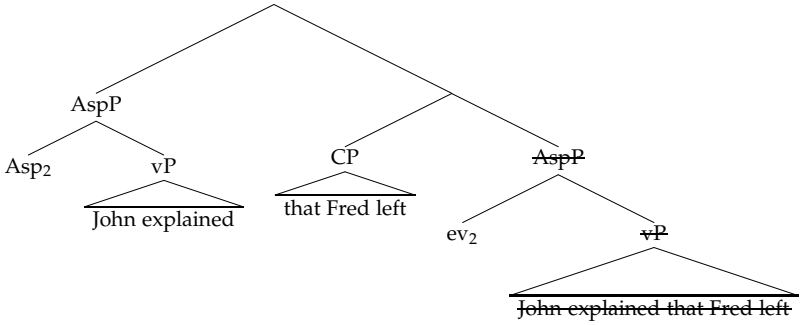
(89) illustrates the familiar spell-out for *wh*-movement under the copy theory of movement (Chomsky 1995). The entire *wh*-phrase is spelled-out high, while the just the *wh*-operator is interpreted there, binding a variable that combines with the NP restrictor in a lower position. (See below on the semantic interpretation of copies.)

(89) Which book did John read which book — syntax
a. $[_{DP}$ Which book] did John read ~~$[_{DP}$ which book]~~ — PF
b. $[_{DP}$ Which$_x$] did John read $[_{DP}$ x book] — LF

AspP movement, being overt, has a similar profile. The whole of AspP fronts—the entirety of higher copy is pronounced. The denotation of Asp (see above) is interpreted in the higher copy. The lower, silent copy consists of a bound variable (here an event variable) and the vP meaning (a property of events). The event variable saturates the event argument of the vP.

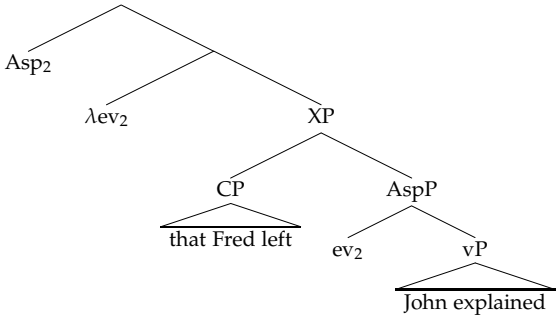
(90) $[_{AspP}$ Asp VP] ... $[_{AspP}$ Asp VP] — syntax
a. $[_{AspP}$ Asp VP] ... ~~$[_{AspP}$ Asp VP]~~ — PF
b. $[_{AspP}$ Asp$_{ev}$] ... $[_{AspP}$ ev VP] — LF

(91) What PF interprets



[31] Another reason to expect that the movement is phrasal is that head movement generally doesn't have the semantic consequences we expect it to if it left a low type trace. That is, modal auxiliaries don't show the expected range of scope ambiguities if head movement had these semantic effects (von Fintel and Heim 2002). However, there have been recent claims that head movement *can* leave such traces (Lechner 2006; Homer 2009; Szabolcsi 2011).

(92) What LF interprets



So to summarize: movement that repairs type clashes indeed does occur in the overt syntax. What copy is pronounced is governed by language specific spell-out rules. Higher CPs are pronounced. Higher Asp heads are pronounced. Moreover, overt movement of this latter kind pied-pipes the complement—so the whole of AspP fronts, and the whole of that higher copy is spelled-out.

4.2 A note on interpreting copies

Now that copy theory has been invoked, the mechanisms of interpreting movement must be revisited. Something must allow the lower copy (of CP and Asp) to be interpreted as low types. This was taken as part of the rule that interprets traces (see e.g. Heim and Kratzer 1998). On the copy theory, something like Fox (2002)'s trace conversion is necessary (see also Sauerland 1998). Trace Conversion takes a copy and (i) rewrites it as a definite description and (ii) inserts a predicate that contains a variable which functions as our trace did (it is bound by the higher, co-indexed lambda).

(93) Trace Conversion
   a. Determiner Replacement
      $[_{QP}$ every treat $]_1 \rightsquigarrow [_{QP}$ the treat $]_1$
   b. Variable Insertion
      $[_{QP}$ the treat $]_1 \rightsquigarrow [_{QP}$ the [x is a treat & λy. y = 1]]

We're going to have to assume that CP movement leaves a copy that can be interpreted in a similar way. The trouble is that there is no determiner to replace. Takahashi (2010) gets some mileage from this very property of copy theory: he derives why left-ward moved CPs can only move from positions that DPs may occupy. In that system, CPs leave definite descriptions, and so he concludes DPs, when they move.

There's good reason to think that this can't be the way to interpret CP copies. There are instances of CP gaps. The clausal proform *so* is one such item, appearing with verbs like *seem* which don't select DPs (Stowell 1987).

(94) a. It seems so.
   b. *That seems.
   c. So it seems.

In addition, *as*-parentheticals have gaps with CP, and not DP, distribution. Postal (1994, 72) shows that *as*-clause extraction is grammatical with verbs like *boast* and *comment*. These verbs do not allow DP objects but rather CP complements.

(95) a. Albert {boasted/commented/complained} that the results were fantastic.
b. *Albert {boasted/commented/complained} that/it/a belief that the results were fantastic.
c. The results were fantastic, as Albert {boasted/commented/complained}.

That there is a true movement dependency here is illustrated by island sensitivity (Postal 1994):

(96) a. *The results were fantastic, as Albert read the claim that Mary boasted.
b. *The results were fantastic, as Albert said whether Mary had boasted.
c. The results were fantastic, as Albert said that Mary had boasted.

Now, what moves in *as*-parentheticals and *so*-proform constructions like (94) may be those very terms or a null operator (Stowell 1987). Either way, something of category CP moves, and Takahashi's trace conversion story (which constrains CPs to leave only DP-type traces) won't work: the gaps here can't be DP positions. And interpreting just the lower copy (e.g. Sauerland and Elbourne 2002) won't get the operator-variable relation needed.

Trace conversion, then, must be re-configured to be a type shifting operation that is "category neutral" as far as the syntax goes. Category Neutral Trace Conversion (CNTC) will apply to lower copies:

(97) Category Neutral Trace Conversion
a. Type shift
$[_{CP_a}\ \alpha\ ]_1 \rightsquigarrow [_{CP_b}\ \cap[_{CP_a}\ \alpha\ ]_1\ ]$
b. Variable Insertion
$[_{CP_b}\ \cap[_{CP_a}\ \alpha\ ]_1\ ] \rightsquigarrow [_{CP_b}\ \cap[_{CP_a}\ \alpha\ \&\ \lambda y.\ y = 1\ ]]$

$\cap$ is Chierchia (1984)'s nominalization operator, nom, which shifts predicates of type $\langle e,t\rangle$ into type *e*. (Potts 2002 makes a related move, but ties the type shift to syntactic category.) The semantics we give to the type-shifter is something like Link (1983)'s maximality operator: it returns an object of type *e*, namely the maximal (sum) individual (or event, see below) that satisfies the predicate denoted by α.

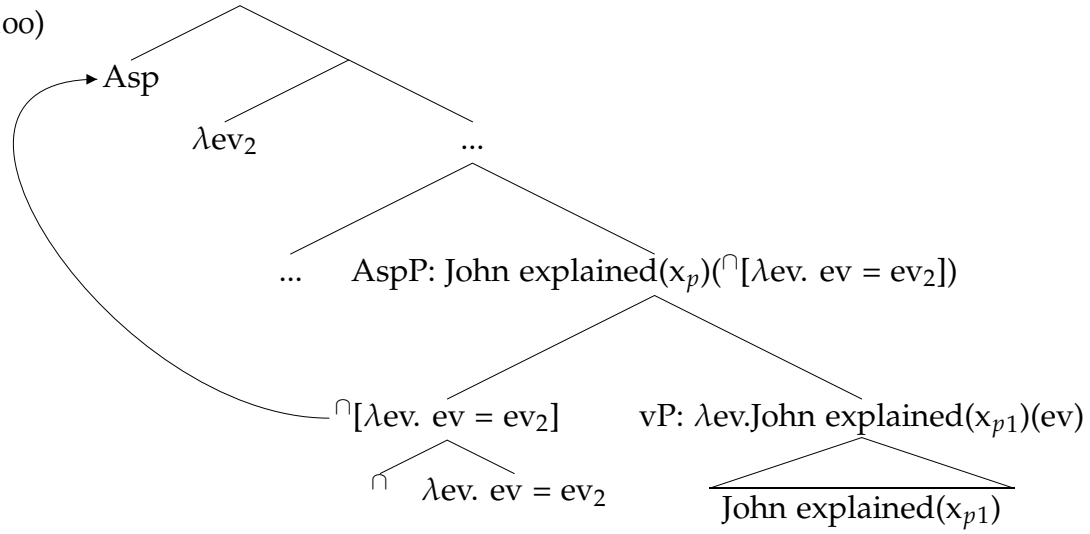
(98) a. If $\alpha \in D_{\langle\tau,t\rangle}$, then $\cap(\alpha) = \sigma(\alpha)$
b. $\cap(\alpha) \in D_\tau$
c. D_τ includes events, individuals, individuals with content

(99) If $[\![\alpha]\!] = \lambda x.P(x)$, then $[\![\sigma(\alpha)]\!]$ = the maximal x.P(x)

As far as we can tell, this is no more ad hoc than Fox's trace conversion operation. But it doesn't carry the same commitments to syntactic category.[32]

In the case of AspP movement, things are somewhat more straightforward, but there's nonetheless a twist. The lower copy copy of the vP portion can be interpreted as usual, as a property of events. The lower copy of the aspect head needs to be interpreted as an event, type *ev*. If the type shifter $\cap$ applies to the complement of Asp^0, vP, and we simply don't interpret an aspect material in the lower copy, the resulting material denotes in type *ev*.[33] Instead, suppose the system allows CNTC to apply just to the copy of Asp^0 (not AspP), returning something of type *ev*, which can then serve as the event argument of the vP. In this respect, AspP movement differs from *wh*-movement, where $\cap$ applies to the restrictor NP. (This is simply a reflex of the fact that the trace of Asp^0 is an argument of the restrictor, whereas the lower copy of a *wh*-word (or a quantifier for that matter) is interpreted as a determiner.)

(100)



(The tree above doesn't show what's going on with the CP or its lower copy.) Clearly, there's much to be learned about the semantic interpretation of the copy theory (see Johnson 2006 for a critical reworking of the pieces involved in interpreting lower copies). But the story here is sound on either copy theory or trace theory. And we've discovered some new desiderata concerning the syntactic categories trace conversion produces. We also predict there will be copies of the CP in a low position: this will satisfy those who worry about binding and Condition C effects with clausal complements (but see Appendix A).

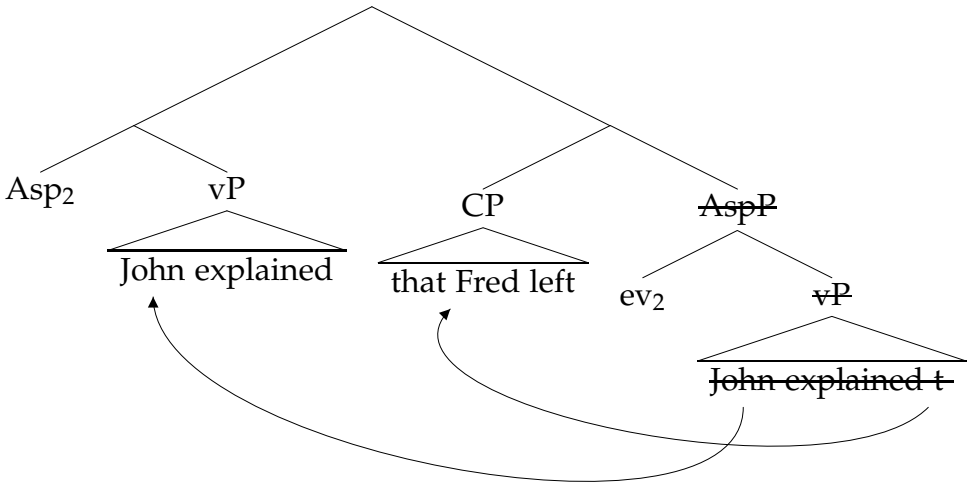
[32]This won't capture one supposed benefit often attributed to trace conversion: that predicate types show only total reconstruction effects (Huang 1993; Barss 1986; Sauerland and Elbourne 2002). I suspect that shifting the copies of, say, VP fronting this way (to individual events) will just cause a type-clash when those converted VP copies combine with higher functional heads, like aspect or tense, which require properties of events not an event. And so total reconstruction is then forced. See below for more about events and trace conversion.

[33]This option would probably work too.

5 The Results

Leaving for now the compositional details, the final *syntactic* analysis looks like this:

(101) The final Syntactic Analysis



It can be immediately appreciated that whatever material is in the Aspect phrase will precede the CP: this includes the verb, arguments (as repeated in (102)) and modifiers of the verb, and (depending on the theory) relatives extraposed from DP arguments of the verb.

(102) DP V CP / *CP DP V

a. . . . weil ich dem Hans sagte, [$_{CP}$ daß Uli krank ist].
. . . because I the Hans said that Uli sick is
'. . . because I told Hans that Uli is sick'

b. *. . . weil ich dem Hans [$_{CP}$ daß Uli krank ist] sagte.

But how much material is in AspP? I've identified Asp as viewpoint aspect. The mapping between the overt morphology and these meanings remains very much a matter of current investigation (see e.g. Kratzer 1998, and recent work by, e.g. Bjorkman 2011), so too whether viewpoint aspect includes values we call *perfect*, and forms such as *have* in English and *haben* in German.

The mechanics we've postulated, however, somewhat underdetermine the surface position of the CP—and this, we think, is a good result. This is because CP positions happen to be variable to some degree. This can best be appreciated in German. CP arguments may appear after the verbal complex—which includes the selecting verb, modal verbs, auxiliaries and a certain range of infinitival-selecting predicates. The CP cannot appear *within* the verbal complex though.

(103) a. . . .weil er gesagt hat [$_{CP}$ daß Schnaps gut scmeckt]
. . .because he said has that schnapps good tastes
'. . .Because he said that schnapps tastes good.'

b. *. . .weil er gesagt [$_{CP}$ daß Schnaps gut scmeckt] hat
(Büring and Hartmann 1997: 72(31))

(104) a. . . .weil er behaupten können wollte daß er Hemingway geschlagen
. . .because he claim be-able want that he Hemingway beaten
hat.
has.
. . .because he wanted to be able to claim that he has beaten Hemingway.'
b. . . .weil er *[$_{CP}$. . .] behaupten *[$_{CP}$. . .] können *[$_{CP}$. . .] wollte.
(Büring and Hartmann 1997: 74(35))

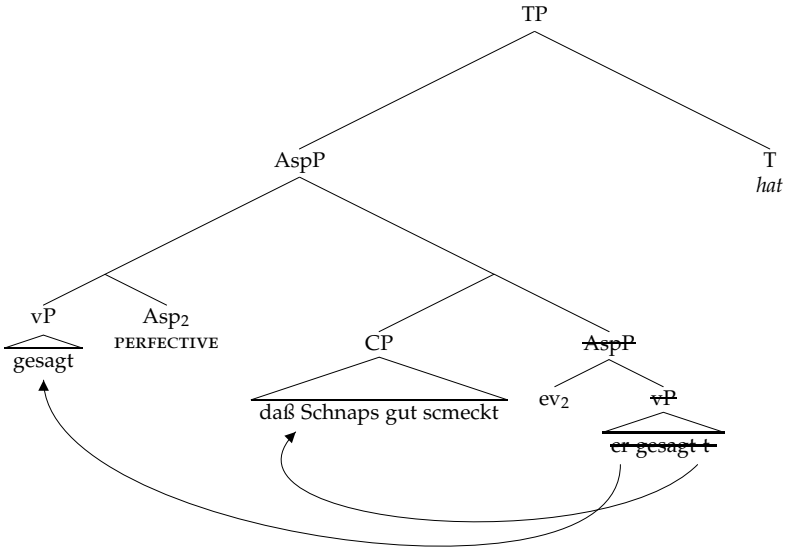
There's good reason, however, to believe that restrictions against the CP appearing within the verbal complex is due to morpho-phonological pressures on the formation of the verbal complex itself, not any inherent prohibition in the syntax (or semantics) against the CP surfacing here. We can see this when the VP undergoes fronting:

(105) [$_{VP}$ gesagt daß Schnaps gut schmekt] hat er.
said that schnapps tastes good has he.
'Say that schnapps tastes good, he has.'
(Büring and Hartmann 1997: 72(31d))

Here we agree with Büring and Hartmann (1997) that this indicates that CPs needn't in principle move higher than auxiliaries and modals. They can move to the edge of what we've identified as viewpoint Aspect phrase (the morphological realization of which is spelled out perhaps on the verb). This parse only surfaces, however, when the pressures of the selecting verb and auxiliaries forming a complex are lifted which are lifted with AspP fronting.

We envision a hybrid solution to ruling out (103b) and (104b): the semantic composition forces the CP to move to a position higher than (viewpoint) Aspect. Assuming the German verbal complex is head-final (putting aside re-orderings within the verbal complex), then this would put the CP between the verb and higher auxiliaries (which I put in T). This is simply ill-formed for morphological (or prosodic) reasons: the verbal complex must not be interrupted (Truckenbrodt 1995; Riemsdijk 1998; Wurmbrand and Bobaljik 2005)

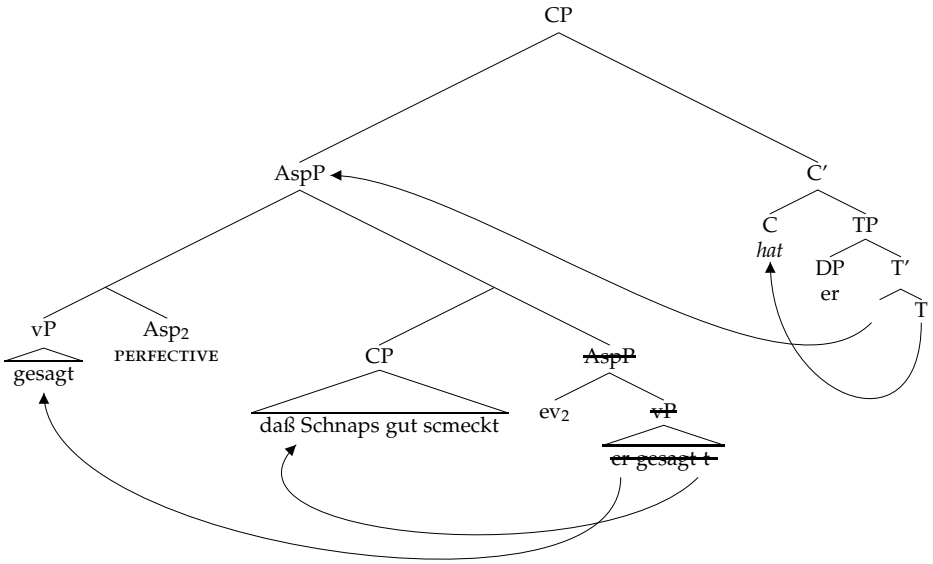
(106) Verbal cluster interrupted



(106) violates the conditions that require the verb, Asp and the auxiliary to form a cluster if they are not separated by movement to C for verb second.

Two other derivations can rescue (106). AspP can front, deriving what we know as VP-fronting (107).

(107)



The other derivation moves CP higher, past Aux. There are at least two ways this may happen. We can imagine a rightward PF movement account: where the extraposition of CP merely serves to get it out of the way of verb cluster formation (Truckenbrodt 1995; Wurmbrand and Bobaljik 2005). (It would be wrong, of course, to think that such movement is *alone* sufficient to get CPs to the right of the verb. Which is to say, appealing to a PF movement here is consonant with the overall analysis.) A semantic alternative is given in Appendix C.

5.1 Only rightward movement

While CPs must move, we predict that AspP will always land higher. Therefore CPs will never *appear* to move leftward. This is borne out, and it can be best appreciated in languages like Farsi and Hindi.

(108) Farsi

a. man mi-dunest-am [$_{CP}$ ke giti khub-e]
I dur-knew-1sg that Giti good-be.3sg
'I knew that Giti is good'

b. *[$_{CP}$ ke Giti khub-e] man mi-dunest-am
that Giti good-be.3sg I dur-knew-1sg
'That Giti is good I knew'
(Farudi 2007: 39(89))

(109) Hindi

a. yah mahatvpūrn hai [$_{CP}$ ki vinod hār gayā]
it significant is that Vinod lost
'It is significant that Vinod lost'

b. *[$_{CP}$ ki vinod hār gayā] mahatvpūrn hai
that Vinod lost significant is
'That Vinod lost is significant'
(Subbarao 1984: 103(9a,9c))

When CPs appear to move to the left in English and German, they are really DPs: fronted CPs can only have DP type gaps (Williams 1981; Grimshaw 1982; Postal 1986).

(110) a. It seems that John left.
b. *That seems.
c. *That John left seems.

(111) a. Most baseball fans hoped/felt/wished that the Giants would win the World Series.
b. *Most baseball fans hoped/felt/wished that.
c. *That the Giants would win the World Series was hoped/felt/wished (by most baseball fans).

Similar facts hold in German. The reflexive predicate *freue mich* takes CPs (112a) not DPs (112b), and likewise does not allow those CPs to move leftward (112c):

(112) a. Ich freue mich [daß Hans krank ist]
I am-happy REFL that Hans sick is
'I am happy that Hans is sick'

b. *Ich freue mich [das]
I am-happy RELF that.
'I am happy about that.'

c. *[daß Hans krank ist] freue ich mich e
That Hans sick is am-happy I RELF
(Webelhuth 1992: 104(118))

A verb like *glauben* 'believe' does select DPs, and so lets CPs front:

(113) a. Er glaubt das nicht.
He believes that not.
'He doesn't believe that'
b. [daß sie kommt], glaubt er nicht e.
That she comes, believes he not.
(Webelhuth 1992: 104(120))

These aren't CPs that are moving, then. (See Koster 1978; Alrenga 2005; Davies and Dubinsky 2010; Takahashi 2010; Moulton 2013 for how these should be derived.)

5.2 CP positions vs. HNPS

The analysis likened the extraposition of argument CPs to HNPS, following Stowell (1981). The primary reason was to capture the freezing effects (P-stranding) in the VP, which we attributed to movement of a verb(al) phrase. But there are a number of differences between HNPS and CP (argument) extraposition that call for explanation. It turns out that the semantic combinatorics invoked here explain them.

One big difference between HNPS and CP extraposition is that the latter is obligatory but not the former. This is immediately captured by the fact that CPs must give rise to the syntax advocated here merely to compose (and we also saw why the movements that give rise to this syntax must be overt). HNPS isn't a type-driven movement, and so it is optional, modulo weight considerations.

5.2.1 Right roof constraint

HNPS and CP argument extraposition differ in locality, too. HNPS can proceed from finite embedded clauses. This is shown by Nissenbaum (2000):

(114) a. I claimed that I liked ___, in order to get you to rent, that movie with Fred Astaire and Audrey Hepburn.
b. #I liked ___ in order to get you to rent, that movie with Fred Astaire and Audrey Hepburn.
(Nissenbaum 2000: 89(3a,b))

The oddness of (114b) shows that the adjunct purpose clause must modify the matrix clause (114a). Since the HNPS'd item follows the adjunct, and is extracted from the embedded clause, HNPS must not be finite clause bound.

CP extraposition is, however, famously finite clause bound. This is true of CP relatives, and of CP arguments, our present focus.

(115) a. *I claimed that I was aware ____, in order to look cool, that red pants were in.
b. I claimed that I was aware that red pants were in, in order to look cool.
c. #I was aware, in order to look cool, that red pants were in.

The adjunct modifies the matrix clause in (115a) (as shown by the oddness of (115c)). A CP cannot shift outside of its finite clause.

We've attributed the position CPs take to a type-repairing movement. QR is likewise a type repairing operation that is (finite) clause bound.

(116) #A different person thought that Mary was sitting in every seat.
a > every/*every > a

One popular idea about the clause-boundedness of QR is related to economy considerations: only QR as far as needed to resolve a type mismatch or to generate a distinct semantic interpretation (Fox 2000; Cecchetto 2004). For CPs, the first viable interpretation site is above the Asp, provided Asp moves. Movement out of a higher AspP is simply uneconomical, and presumably not what type-fixing operations allow.

The relative porousness of infinitival complements allows both QR and CP extraposition of clausal arguments (see example (104a) above).

6 Conclusion: It takes a noun to embed a clause

Looking at complementation strategies cross-linguistically one finds a recurring pattern: complement clauses like to be noun-y. Complement clauses are often nominalized, for instance, in Korean (117).

(117) Mary-nun [John-i kil-ul kenne-ss] **-um** **-ul** al-ass-ta.
Mary-TOP John-NOM street-ACC cross-PAST NMLZR -ACC know-PAST-DECL
'Mary learned that John had crossed the street.'

(118) Mary-nun [John-i sihem-ey hapkyekha] **-ki** **-lul** pala-n-ta.
Mary-TOP John-NOM exam-in pass NMLZR -ACC hope-PRES-DECL
'Mary hopes that John will pass the exam.'
(Horie 2000: 16(11))

Another strategy found in Korean uses a semantically 'light' noun *kes*, 'thing'

(119) Mary-nun [John-i sihem-ey hapkyekha-n] **-kes** **-ul** al-ass-ta.
Mary-TOP John-NOM exam-in pass-ADN:PAST NMLZR -ACC know-PAST-DECL
'Mary learned that John passed the exam.'

(120) Mary-nun [John-i sihem-ey hapkyekha-l] **-kes** **-ul** pala-n-ta.
Mary-TOP John-NOM exam-in pass-ADN:FUT NMLZR -ACC hope-PRES-DECL
'Mary hopes that John will pass the exam.'
(Horie 2000: 16(11))

It looks, then, like it often takes nominalization to embed clauses. Light nouns like *kes* commonly perform this function. In Mohawk, Baker (1996) shows, it can be seen quite clearly that it takes a noun to embed a clause. A noun-taking verb such as *-nuhwe'* 'like' can take a clausal complement (and shift to meaning something like 'agree') with the addition of an incorporated noun *-rihw*.

(121) a. Sak rake **-nuhwe'** -s
Sak MsS/1sO **-like** -HAB
'Sak likes me.'
b. Sak ro- **-rihw** -a **-nuhwé'** -u a-ha-'sere-ht-óhare-'
Sak MsO **-matter** -∅ **-like** -STAT OPT-MsS-car-NOM-wash-PUNC
'Sak has agreed to wash the car'
(Baker 1996: 462(23))

-rihw is a "very general word referring to a kind of proposition" (Baker 1996) meaning *'matter', 'affair', 'fact', 'news'*. Baker lists a number of predicates that take clauses by incorporating this noun.

(122) Building CP-taking verbs using nouns in Mohawk

CP-taking verb	Literal gloss	Free gloss
rihw-a-nuhwe'	matter-like	'to agree to S'
rihw-a-tshuri	matter-find	'to find out that S'
rihw-a-yuta's	matter-acquire	'to decided to S'
rihw-isak	matter-seek	'to investigate S'
rihw-a-ruk	???	'to hear that S'

Baker speculates that the incorporation of a noun (sometimes covert) is a part of a general recipe for embedding finite clauses in the language.

Notice that this general word referring to a proposition *-rihw* is really just an all-purpose content noun; the things we notated x_p, which CPs are predicates of. Mohawk is confirmation that CP make use of such nouns to get themselves embedded.

A very similar strategy is found in Adyghe (Caponigro and Polinsky 2011). Here, though, the argument CP itself looks exactly like a relative clause. (123) shows how a relative clause is formed:

(123) a. č'ale-m šʷanə-m xate-r
boy-ERG hoe-OBL orchard-ABS
∅-∅-r-jə-pč'e-š'tə
3SG.ABS-3SG.OBL-APPL-3SG.ERG-weed-FUT boy-ABS
'The boy will be weeding the orchard with a hoe.'
b. xate-r šʷanə-m ∅-∅-rə-zə-pč'e-š'te
orchard-ABS hoe-OBL 3SG.ABS-3SG.OBL-APPL-REL.ERG-weed-FUT
č'ale-r
boy-ABS
'the boy who will be weeding the orchard.'
(Caponigro and Polinsky 2011: 84(35–36))

In (124a), the complement clause bears the same relativizing morphology (underlined). Note that the verb can appear to select for the CP directly, as in (124a). Alternatively, a content noun can appear—a word glossed a s*news* (124b).

(124) a. čale-r qə-z̲ə̲-re-k$_w$ež'ə-š'tə-r ə-g$_w$ərə?$_w$eʁ
boy-ABS INV-REL.OBL-APPL-return-FUT-ABS 3SG.ERG-understood.
'She understood that the boy arrived.'

b. [[čale-r qə-z̲ə̲-re-k$_w$ež'ə-š'tə] **qeba-r**]]
boy-ABS INV-REL.OBL-APPL-return-FUT **news-ABS**
ə-g$_w$ərə?$_w$eʁ
3SG.ERG-understood.
'She understood the news that the boy arrived.'
(Caponigro and Polinsky 2011: 106(108–109))

Caponigro and Polinsky (2011) conclude that the verb selects a content noun in (124a), too. It's just that the language allows that noun to be silent.

The Indo-Eurpean languages we've been looking at don't seem to follow this pattern. Although the very first work on clausal complementation (Rosenbaum 1967) proposed that clausal complements we NPs,

(125) NP
|
S

Emonds (1976)[1970] taught us that this wasn't correct, and we since learned about the category CP (Bresnan 1972). But now we can see UG in the complementation strategies of both German-type languages and Mohawk and Korean-type languages. It always takes a noun to embed a clause. Some languages have the morphological means to turn CPs into NPs. This doesn't seem possible in most cases in Indo-European.[34] Instead, movement furnishes from the verb phrase a noun for the CP to combine with.

It's not surprising where we find the locus of variation: what one language does with morphology, another does with movement.

7 The Appendices

7.1 Appendix A: Binding and Reconstruction

Condition C is a not a reliable diagnostic for the position of certain CPs. Haider (1995) shows that pronouns that do not c-command CP complements can nonetheless give rise to disjoint reference effects (126a)–(126c), even if the CP is extraposed (126d).

(126) a. *Seine$_i$ Aussage lautet, daß Max$_i$ zu Hause gewesen sei.
his deposition states, that Max to home been was.
'His deposition states that Max has been home.

[34]Save for those languages that allow determiners to select CPs: Farsi, Spanish, Greek. Questions arise whether there is a null noun in these case (Farudi 2007).

b. *Seine$_i$ fixe Idee ist, daß Max$_i$ ein Vampir ist.
his obsessive idea it, that Max a vampire is
'His obsessive idea is that Max is a vampire.'
c. *Wir haben [seine$_i$ Aussage, daß Max$_i$ zu Hause gewesen sei], überprüft.
We have his deposition that Max to home been was checked.
'We have checked his deposition that Max has been home.'
d. *Wir haben [seine$_i$ Aussage] überprüft, daß Max$_i$ zu Hause gewesen sei]
(Haider 1995: 257(28a,b)–(29a,b))

Furthermore, the disjoint reference effects in complement CPs contrast with the more well-behaved ones in relative CPs (Haider 1995). As expected from c-command, the referring expression in the extraposed relative in (127) doesn't give rise to a disjoint reference effect, but the one in the complement CP does. And given the order, it's hard to imagine that the relative CP is not c-commanded by the possessor but the argument CP is.

(127) seine$_i$ Forderung, die Max$_i$ per Fax gestellt hat, daß Max$_i$ freies Geleit
his demand that Max by Fax made has that Max safe conduct
erhalte.
gets
'His demand that Max made by fax that Max get safe conduct...'
(Haider 1995: 257(30))

One suspicion, of course, is that there is a semantic reason for the disjoint reference effects (see, for instance, Kuno (2004), among others). The contrast between relatives and complements relates to the fact that the complements typically report a proposition from the perspective of the subject (or possessor of the selecting noun). Turning to English, we can manipulate, of course, whether the possessor is the perspectival center (or the 'author', to borrow a term used in work on indexical shift). There is way to understand (128) so that Max is not the author of the deposition, but perhaps recorded it from Mary.

(128) Max took depositions from several people, to prove that he was innocent.
a. We checked his$_i$ deposition from Mary that Max$_i$ was at home all night.
b. His$_i$ deposition from Mary indicated that Max$_i$ was at home all night.
c. The deposition he$_i$ got from Mary indicated that Max$_i$ was at home all night.

However, when Max is the one making the deposition, a disjoint reference effect is apparent:

(129) Max gave his deposition to the police.
a. *We checked his$_i$ deposition that Max$_i$ was at home all night.
b. *His$_i$ deposition indicated that Max$_i$ was at home all night.
c. *The deposition he$_i$ gave indicated that Max$_i$ was at home all night.

Now, to complicate matters, we should point out that disjoint reference effects appear to be lifted when the CP is fronted—and here we can't attribute it to a distinction in the perspectival centre or authorship of the embedded claim, since these remain constant between the post-verbal and fronted case:

(130) a. daß sie Max_i nett findet, hat sie ihm_i nicht gesagt.
that she Max nice considers, has she him not said.
'That she considers Max nice, she has not told him.
b. *Sie hat ihm_i nicht gesagt, daß sie Max_i nett findet.
(Haider 1995: 257(30))

We could conclude that it is linear order that rescues the disjoint reference effect here. So there is some complex interaction between linear order and the use of referring expressions in clauses that report propositional content from author's or addressee's perspectives.

Alternatively, we may follow Koster (1978); Moulton (2013) and others and base generate the CPs in (130) high, thus bleeding Condition C. The reason CP argument 'extraposition' doesn't bleed Condition C (unlike, say, A-movements of the familiar sort) is that it must leave a copy. In fact, once again, comparison to QR is apt. QR can't bleed Condition C either (see e.g. Fox (1999). Even if the universal in (131) takes wide scope over the subject, it still introduces a disjoint reference effect.[35]

(131) A different woman reported him_i to every cop that $\text{John}_{j/i}$ was afraid she would.

We might conclude then that the lower copies of CPs must be present. In fact, this is just what we expect: we can't pull a late-merger story (Fox 2002; Takahashi and Hulsey 2009) for our CPs because there is nothing besides the CP moving to late merge it to. It's in virtue of movement of the (whole) CP that allows it to successfully compose. That means there's a lower copy, and that gives rise to disjoint reference effects.

7.2 Appendix B: Extraction

One of the arguments made for an *in situ* analysis of clausal complements in OV languages (Zwart 1993) cam from extraction. Since extraction is possible from finite clauses, we

(132) a. (Ich weiss nicht) wen_1 er gesagt hat [$_{CP}$ daß Claudia t_1 geküst
I know not whom he said has that Claudia Peter
hat]
kissed has
'I don't know who he said that Claudia has kissed'
b. Who did John tell the woman yesterday who he

[35]ACD alleviates this, for reasons celebrated in (Fox 2000) and others:

(i) A different woman reported him_i to every cop that $\text{John}_{j/*i}$ was afraid of.

Müller (1998) reports that some speakers of German allow 'heavy' NPs to shift rightward past the verbal complex.

(133) ?daß keiner je t_2 gelesen hat [*NP* Bücher über dieses Thema die der
that no-one ever read has books about this theme that ART
Fritz verfasst hat]$_2$
Fritz written has
(Müller 1998: 176(72))

To the extent that such HNPS is acceptable, Müller reports, extraction from it "does not noticeably decrease acceptability" (Müller 1998: 176).[36]

(134) ?[*PP* über dieses Thema]$_1$ daß keiner je t_2 gelesen hat [*NP* Bücher t_1 die
about this theme that no-one ever read has books that
der Fritz verfasst hat]$_2$
ART Fritz written has
(Müller 1998: 176(74))

English, apparently, works differently. Extraction is blocked from HNPS (Wexler and Culicover 1981):

(135) ?*What did you give to John a book about ___?
(Lasnik and Saito 1992: 103)

This would be more detrimental if we had completely idenitfied English HNPS and CP complements. But we didn't: they both share a derivation where a remnant verb phrase (or AspP) moves leftward (as diagnosed by the P-stranding constraint). We've already seen differences in the (semantic) motivations for these movements. All we must admit is that moved phrases don't necessarily constitute CED domains (Huang 1982). And that's just an empirical fact (Müller 1998).

8 Appendix C: all auxiliaries move overtly like quantifiers

We can extend the syntax-semantics proposed here to higher verbal heads so that they move past CP, just as Asp^0 can. Suppose, for instance, that the perfect auxiliary *haben* has the following denotation (the variable *i* is for times; recall that the output of AspP is a property of times):

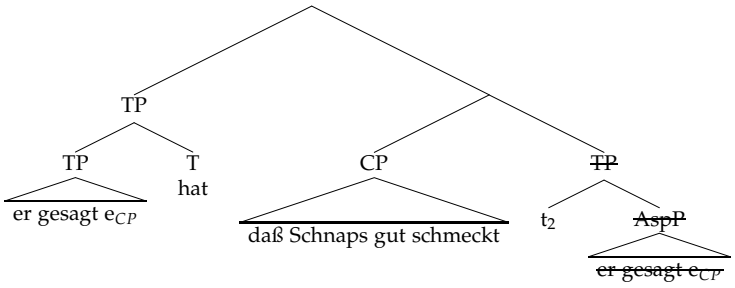
(136) $[\![\textit{perfect}]\!] = \lambda P_{i,t}.\lambda t_i.\exists t'[t' \leq t \ \& \ P(t')]$

If *perfect haben* moves leftward (whether it is tensed or not) we get LFs similar to those found with Asp fronting, but instead of an event variable saturating the vP, a time variable is left by TP fronting. With CP fronting, this will give rise to a one-place, non-verbal predicate for the CP to combine with:

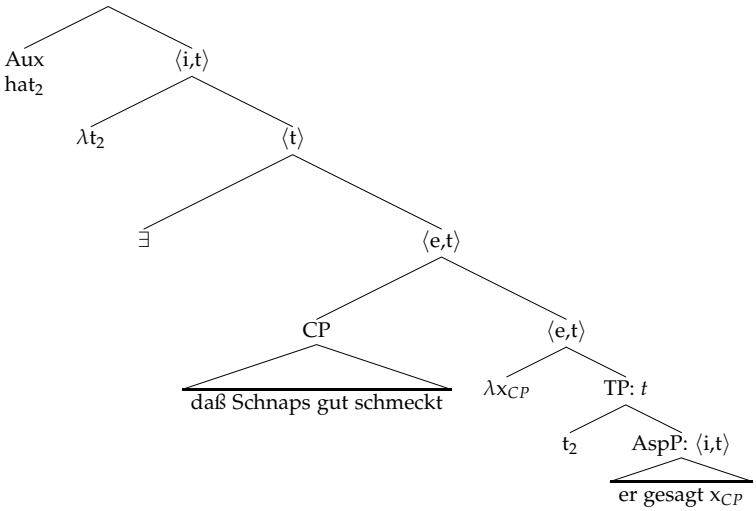
[36] Müller points out that HNPS'd DPs are better if definite. But extraction is not possible from definites, as usual. So some of the degradation may follow from the indefinite.

(137) ...weil er gesagt hat [daß Schnaps gut schmeckt]

(138) The PF



(139) The LF



When the CP follows a verb cluster topped by modal, it means the modal has moved leftward (pied-piping all phrases it dominates, save for the CP).

(140) a. ...weil er behaupten können wollte daß er Hemingway geschlagen
...because he claim be-able want that he Hemingway beaten
hat.
has.
...because he wanted to be able to claim that he has beaten Hemingway.'

Modals, being quantifiers over possible worlds, would likewise move, leaving a world-type trace that saturates TP "temporarily". It is, of course, an active research question whether modals undergo such semantic movement or not. If so, the account can be extended in this way. If not, it is perfectly reasonable to assume that a PF movement ensures the CPs, when they are forced to move for type reasons, don't end up disrupting the verbal complex (Wurmbrand and Bobaljik 2005).

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