CPs: Copies and Compositionality

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Finite clausal arguments differ from other arguments—and other CPs—in two fundamental ways: (a) they do not move leftward (Koster 1978, Alrenga 2005, Takahashi 2010, Moulton 2013) and (b) they may combine with nouns that do not accept arguments (Stowell 1981, Grimshaw 1990). I argue that finite clausal arguments are predicates of propositional content (type ⟨e,⟨s,t⟩⟩), following proposals in Kratzer 2006, Moulton 2009. They combine with nouns by Predicate Modification, explaining (b). In order to complement verbs, CPs trigger two type-driven leftward movements (CP-movement and remnant AspP-fronting). I argue that the resulting configuration prevents further leftward movement of clausal arguments, explaining (a). Also derived are the right-peripheral position of CPs relative to arguments and the verbal complex in Germanic, freezing effects in the VP, extraction from and binding into CPs, and the similarities and differences among CP argument extraposition, heavy NP shift, and relative clause extraposition. More broadly, the proposal demonstrates that copies can denote restricted variables, but need not be DPs (cf. Fox 2002, Takahashi 2010, Johnson 2012).

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1 *That*-Clauses versus CP Proforms

According to a standard picture, the distribution of arguments is determined by syntactic requirements (like case licensing) and semantic requirements (like selection). These two requirements often compete, forcing arguments to appear in positions in which they are not semantically selected. It is movement, particularly as it is understood by the copy theory (e.g., Chomsky 1995, Sauerland 1998, Fox 1999), that mediates these requirements. Copies are diagnosed by connectivity.

(1) a. Who impersonating him$_i$ should no one$_i$ see ~~who impersonating him$_i$~~?
b. *Who impersonating John$_i$ should he$_i$ not see ~~who impersonating John$_i$~~?

In addition to capturing connectivity effects, lowest copies fulfill the Projection Principle. In (1), for instance, the low copies saturate the internal argument of *see*.

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This standard picture, however, is designed for nominal arguments. How other categories fit—in particular, CPs—is currently unknown. In fact, it is not clear that many CPs even move. When finite CPs appear left-dislocated, they may only associate with gaps in positions where DPs are otherwise licensed. This is true of sentential subjects,[1] and it is equally true of topicalized CPs. This DP requirement is well-documented (Williams 1981, Grimshaw 1982, Postal 1986, Webelhuth 1992, Alrenga 2005).

(2) a. Most baseball fans believed/knew/expected that the Giants would win.
b. Most baseball fans believed/knew/expected that/it.
c. That the Giants would win, most baseball fans believed/knew/expected.

(3) 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. *That the results were fantastic, Albert boasted/commented/complained.

Movement-based frameworks offer two ways to address the DP requirement. One line is that a DP in the form of a null operator is recruited, and CPs are high, base-generated satellites (Koster 1978, Alrenga 2005). The other line is that CPs that move are in fact embedded in null DPs (Davies and Dubinsky 2010, Takahashi 2010). Both of these solutions have the following corollary. In order to capture the fact that CPs *must* rely on one of these DP strategies, the grammar must prevent CPs from themselves moving alone. And here's the interesting thing: there is no general ban on things of category CP moving. The CP proform *so* is such an item (Stowell 1987). Distribution tests confirm that *so* is a CP: it complements verbs like *seem*, which allow only CP arguments (4b). Crucially, *so* may be displaced (4c).[2]

(4) a. It seems so/that John left.
b. *That (it) seems./*It seems that.
c. So it seems.

As-parentheticals provide another case of CP-movement. Postal (1994:72) shows that the gaps in *as*-clauses can be complements to verbs like *boast* and *comment*. As (3) shows, these select CP but not DP complements.

(5) The results were fantastic, as Albert {boasted/commented/complained}.

Ross (1984) and Postal (1994) provide examples of island sensitivity, establishing a movement dependency here.[3]

With this larger class of CPs taken into account, we can see that there is no general ban on moving CPs—just a particular ban on moving *that*-clauses leftward. What, then, is the difference between *so*/*as* and *that*-clauses that determines their movement options? There is another difference that is revealing: *so* cannot complement nouns, but *that*-clauses can.

[1] Debate persists about whether CPs can be subjects (Koster 1978, Delahunty 1983, Davies and Dubinsky 2010). The issues in this article are orthogonal to this debate.

[2] In fact, as a reviewer points out, *so* has an operator-like status elsewhere (e.g., *so tall a man*).

[3] What moves in *as*-parentheticals may actually be a null operator (Stowell 1987, Potts 2002). Even so, it is a CP null operator.

(6) a. I believe/claim/am afraid so.
b. my belief/claim/fear that pigs fly
c. *my belief/claim/fear so

This is a very systematic pattern. No clause-taking nouns take *so* (Hallman 2006). Now, not all clause-taking verbs select *so*, either. Let me pause to address this issue. Recent literature claims there is a division among clause-taking verbs that is tracked by *so*. De Cuba and Ürögdi (2009) and Haegeman and Ürögdi (2010) suggest that *so* cannot combine with the class of verbs that select what they call ''referential CPs'' (7). Referential CP complements include factive complements (*know*, *regret*). But as Bhatt (2010:176–177, (4b), (5a)) notes, there are naturally occurring examples of *know* selecting *so* (8).

(7) John regretted that Bill had done it, and Mary regretted [it/*so] too.
(Kiparsky and Kiparsky 1970:166)

(8) a. I knew you would be angry enough about that, madam, or I should have told you before; and he knew so too . . .
(Radcliffe, Ann. 1794. *The Mysteries of Udolpho*. http://www.gutenberg.org/files/3268/3268-h/3268-h.htm)
b. Rooney knew he was special from a young age. And those who nurtured a talent that comes along rarely in any sport knew so, too.
(http://www.dailymail.co.uk/sport/article-389647/Walking-miracle.html)

Kastner (2013) has argued for the importance of Cattell's (1978) three classes of clause-taking predicates.

(9) a. Volunteered-stance: allege, assert, believe, deem, feel, say, tell, think
b. Response-stance: accept, admit, agree, confirm, deny
c. Nonstance: (be) aware, (be) certain, comment, convince, doubt, mention, notice, realize, recall, regret, remember, remind

Cattell's classes have been shown to be linguistically relevant for extraction (Szabolcsi 2006) and embedded root phenomena (Kastner 2013). However, the distribution of *so* and *that*-clauses does not correlate.[4] Response-stance and nonstance verbs (as well as factives) can take the trace left by *as*-extraction, which is a CP.

[4] Kastner (2013) argues that response-stance and nonstance verbs select DPs and that their apparent CP complements are headed by a null D. This line faces obstacles from those response-stance and nonstance verbs that do not select for overt DPs.

(i) a. I agree *(to/with) something. (American English)
b. I convinced/reminded him *(of) something.
(cf. I told him (*of) something)
c. I commented/remarked *(on) something.
(Cattell 1978:63–64)
d. I was aware/certain *(of) that.

See also Haegeman and Ürögdi 2010:136.

(10) a. The results were not fantastic . . . as Albert admitted/agreed/mentioned/realized/regretted/reminded me.
b. Fred is, as no one denies/doubts, a wonderful nurse.

And even some response-stance and nonstance verbs can select *so*, as the following naturally occurring examples with *admit* and *convince* demonstrate:

(11) a. She did pay the woman who cared for her daughter with drugs because that is what the woman asked for. She would not admit so to DYFS because she feared the consequences.
(Ryan, Edward S. 2000. Case studies of the psychological and forensic assessment of parental child abuse. *Journal of Instructional Psychology* 27:3)
b. Gebara further asserted that politically ''advanced'' priests and nuns favor decriminalization, but admit so only in ''very restricted circles.''
(Serbin, Ken. 1995. Simmering abortion debate goes public in Brazil. *Christian Century* 112(8):2666)
c. Each of the stories is about a ''real'' person; we are convinced so because their presence is faithfully recorded in photographs.
(Ramamurthy, Priti. 2004. Why buying a ''madras'' cotton shirt is a political act: A feminist commodity chain analysis. *Feminist Studies* 30:743)

There are interesting restrictions on which verbs appear with *so*, which deserve the attention of future work (see Sailor 2012). But those restrictions appear to be orthogonal to the questions of category and movement that I am investigating. Importantly, there is no such lexical variation when it comes to nouns. In the list of clause-embedding nouns in Higgins's (1973) appendix (list 3, pp. 347–348), I have found none that take *so*.

(12) *the/her {admission, announcement, answer, assertion, assumption, claim, comment, complaint, conclusion, expectation, guess, hope, indication, inference, judgment, knowledge, objection, prediction, presumption, pretence, promise, prophecy, proposal, reasoning, report, ruling, sense, speculation, statement, stipulation, supposition, suspicion, teaching, theory, thought, threat, understanding, worry} so

To recap, all clause-embedding verbs that can select *that*-clauses can take the CP traces of *as*-extraction, and many take *so*, but nouns cannot select *so*.[5] Neither these contrasts nor the movement contrasts between *so*/*as* and *that*-clauses can stem from a difference in category (all are CPs) or grammatical function (none need case). This second point is important: since Stowell 1981, the unique distribution of CPs has been tied to the fact that they do not participate in the case system (the Case Resistance Principle). But the Case Resistance Principle won't explain why *so* can't combine with nouns. And there's another surprising thing about CP-taking nouns

[5] Constraints on extraction prevent testing whether nouns combine with the traces of *as*.

that confirms that case and category are irrelevant: clause-taking nouns don't even allow PP arguments that substitute for propositional meanings.[6]

(13) a. He claimed that./*his claim of that
b. I believe the story./*the belief of the story
(Zucchi 1989:14, (28c))
c. *the idea of that
d. *the fact of that

The simple fact is that clause-taking nouns do not take propositional arguments, even when housed in case-assigning PPs. I will provide more robust evidence for this conclusion in section 2.2 with facts uncovered by Grimshaw (1990) showing that clause-taking predicates do not form complex event nominalizations that take internal arguments. This means that something more fundamental separates *that*-clauses from DPs, PPs, and even CP proforms. The more fundamental difference, I claim, lies in the way *that*-clauses *semantically* combine with predicates: CP proforms combine as arguments, while *that*-clauses do not; they merely modify an argument slot.

The idea that *that*-clauses are not normal arguments is not a new one (Stowell 1981). Recently, their likeness to relative clauses has often been exploited (Arsenijević 2009, Kayne 2009, Caponigro and Polinsky 2011). In this article, I propose a related but different idea: following proposals in Kratzer 2006 and Moulton 2009, 2013, I argue that *that*-clauses are predicates of propositional content. To support this, I show that *that*-clauses cannot merely denote propositions (type ⟨s,t⟩). Rather, *that*-clauses denote properties of individuals that carry propositional content (type ⟨e,st⟩). This is what nouns like *idea*, *rumor*, and *myth* denote. And that in turn explains why CPs may combine with non-argument-taking nouns (as in (6)): they combine by Predicate Modification with nominals of the same semantic type (Kratzer 2006). With this existence argument for a predicative analysis of *that*-clauses established, I then show that a similar treatment is needed for *that*-clauses in other syntactic contexts, in particular as complements of (derived) nominalizations. This in turn establishes that clause-taking predicates select for arguments of type *e* that denote things with propositional content (not propositions directly).

If *that*-clauses do not saturate, then we must ask how they serve as arguments of verbs, in many cases as obligatory internal arguments.

(14) John believed/explained/admitted/regretted *(that pigs fly).

That-clauses are paradoxical: they do not saturate nouns, but they do appear to saturate verbs. It is tempting to resolve this tension by giving *that*-clause complements of verbs a different semantics (and syntax) than *that*-clause complements of nouns. I will argue, however, that the syntax guides

[6] To the extent that speakers allow such PPs, they do not correspond to the propositional argument; rather, they correspond to what the myth/claim/idea is about.

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

See Moulton 2013 for the role of so-called *res* arguments (Kaplan 1968) in nouns. Tellingly, *about* can successfully replace *of* in these examples.

us toward a different conclusion—that movement resolves this tension. Finite clausal complements generally occur rightmost in the verb phrase. This fact can be best appreciated in Indo-European OV languages, like German (15), where CPs obligatorily extrapose, while DPs and PPs do not.

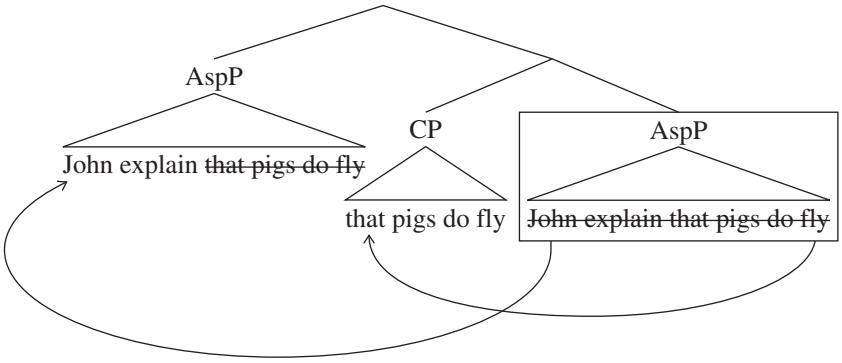
(15) a. Wir haben [$_{DP}$ Peters Behauptung dass er zu Hause gewesen sei] überprüft.
we have Peter's claim that he at home been was checked
'We checked Peter's claim that he was at home.'
(Büring and Hartmann 1995:188, (18b))

b. *. . . weil er [$_{CP}$ dass Schnaps gut schmeckt] gesagt hat
. . . because he that schnapps good tastes said has
' . . . because he said that schnapps tastes good.'
(Büring and Hartmann 1995:201, (49a))

c. . . . weil er gesagt hat [$_{CP}$ dass Schnaps gut schmeckt]
. . . because he said has that schnapps good tastes
' . . . because he said that schnapps tastes good.'
(Büring and Hartmann 1995:201, (49b))

I propose that the right-peripheral position of *that*/*dass*-clauses results from the type clash they create in object position. They must move to leave a copy that denotes the right type to saturate the clause-taking verb. But as I will show in detail, CP-movement alone will not resolve the type clash. And, correlatively, it turns out that the syntactic evidence suggests a yet more complex story for (15) is needed anyway—the right-peripheral position of *that*-clause complements cannot be merely the result of rightward extraposition. Various researchers, in particular Hinterhölzl (1999), have argued that CP positions result from two movements: *leftward* movement of the CP, followed by leftward remnant movement of the verb phrase. I will review evidence for this approach and I will add further evidence for English from freezing effects (Stowell 1981, Wexler and Culicover 1981). I will argue that the remnant that moves is the phrase projected by Aspect, AspP. The target syntax is (16) (overstriking indicates unpronounced copies).

(16)



This syntax is baroque, of course, but we will see that it fares better than conventional extraposition analyses (Stowell 1981, Büring and Hartmann 1997) and early antisymmetry analyses (Zwart

1993). But most relevantly, it offers a natural resolution to the type clash problem, once the resulting semantics of Aspect movement is invoked (Hacquard 2006, Kim 2007) in combination with CP-movement. The payoff is a uniform semantics for *that*-clauses—one that reconciles their syntactic structure (which includes remnant movement) and their semantic type (as predicates that do not saturate). Further, we get an answer to the question we began with: why do *that*-clauses not move while CP proforms do, and how is this connected to their (in)ability to saturate? The answer is that *that*-clauses *do* move, but only to one very specific place—one that allows them to compose semantically. I will show in section 4.2 that further movement is blocked, preventing *that*-clauses from topicalizing or moving to subject position (3). CP proforms, on the other hand, invoke none of this complexity. They semantically saturate and move like normal arguments. The contrasting behavior of *that*-clauses and CP proforms with respect to nominalization and movement is thereby connected.

The proposal makes a number of independent predictions that are borne out, including predictions about reconstruction effects, extraction possibilities, and properties that distinguish *that*-clause complements from other ''extraposed'' CPs (such as relatives) and heavy-shifted NPs. Each of these predictions favors the complex remnant analysis and its consequences for semantic interpretation.

First, however, I make the case for a predicative treatment of CPs.

2 The Semantic Type of *That*-Clauses

2.1 The Lesson from Content Nouns

We usually think that the clausal complements of verbs like *believe* and *mention* denote propositions. In one useful tradition, propositions are sets of possible worlds (type ⟨s,t⟩). And indeed the standard treatment of the propositional attitudes (Hintikka 1969) encourages translating CPs into propositions, so construed.

That view is too simple. I will argue that *that*-clauses must denote something *related* to propositions, but not propositions per se. Consider the following kinds of copular sentences, first broached by Higgins (1973):

(17) The idea/myth/story/rumor/fact is that Bob is a fraud.

As Potts (2002) points out, the predication here is *equative*: what the DP subjects denote, the CP denotes too. Now if the CP denotes a proposition, a set of possible worlds, then the DP subjects would have to denote propositions too. But literally equating ideas and stories with propositions cannot be correct.[7] Stories can be long and boring. But propositions can't be. Rumors can be mean; they can be spread by people. But you can't spread sets of possible worlds, nor can worlds be mean. Myths can be old and Greek; ideas can be new and exciting. None of these is something that a proposition can be. The CP in (17) does not denote a proposition.

[7] I thank Angelika Kratzer (pers. comm.) for teaching me this argument.

What *do* content nouns like *myth*, *story*, and *rumor* denote? They denote individuals, but of a special sort. They are individuals with propositional content, variables that I subscript as x_c (see Moltmann 2013 for related and detailed discussion of these issues). They are things that can be mean, old, long, and boring and yet still carry propositional content.

(18) $[\![\textit{idea}]\!] = \lambda x_c \lambda w.\text{idea}(x_c)(w)$

Given the identity expressed by (17), it follows that *that*-clauses must denote something similar. Kratzer (2006) suggests that *that*-clauses are predicates that spell out propositional content and that complementizers are the bridge from *things* with propositional content to propositions proper. The idea of projecting modal domains from individual ''anchors''—events, situations, and individuals—has its roots in Hacquard 2006. Kratzer (2006, 2012, 2013) and Hacquard (2006) argue for a ''content mode'' of projection, which requires anchors that have information content, like rumors, ideas, and even mental states.[8] The content mode of projection involves the function CONT, which takes such a contentful individual at an evaluation world and returns a set of possible worlds compatible with the information content of that individual (19a). Kratzer (2006) suggests that the complementizer C houses this function (19b): C takes a proposition p, a content argument x_c, and the usual world argument and identifies p as the propositional content of x_c.[9]

(19) a. $\text{CONT}(x_c)(w) = \{w' : w' \text{ is compatible with the intentional content determined by } x_c \text{ in } w\}$
(after Kratzer 2013:195, (25))

b. $[\![C]\!] = \lambda p \lambda x_c \lambda w\ [\text{CONT}(x_c)(w) = p]$
(after Kratzer 2006)

c. $[\![\text{that Bob is a fraud}]\!] = \lambda x_c \lambda w.\text{CONT}(x_c)(w) = \lambda w'.$ Bob is a fraud in w'

(19c) describes individuals whose content is that Bob is a fraud.[10] This approach gives the correct result for the copular case in (17), where the (type e) subject DP is predicated of the $\langle e,st\rangle$-type CP (taking *be* as vacuous).

(20) $[\![\textit{the idea is that Bob is a fraud}(w)]\!] =$
$\lambda w[\text{CONT}(\iota x_c \text{idea}(x_c)(w))(w) = \lambda w'.$ Bob is a fraud in $w']$
(Kratzer 2006:4, (11))

[8] Kratzer (2012) presents evidence that modals like German *sollen* call upon an *informational conversational background*, which invokes the propositional content of information sources like rumors and so on.

[9] The individual argument in factives corresponds to a fact, from which a proposition is projected. Giving a formal extension of the proposal to knowledge ascription would take us too far afield (see Kratzer 2002). The existence of constructions like *John regretted the fact that p* warrants the inclusion of factives in the story I am telling.

[10] The content *is* the associated proposition. This ensures that further propositions cannot be added since they would be identified. Outside of mathematical statements, for which a possible-worlds semantics has difficulty anyway, this correctly prevents ''stacking'' CP complements to nouns. A reviewer suggests that ''stacked'' CP complements may be acceptable: *John's report that it's raining that he couldn't go*. If so, this must involve asyndetic coordination of propositions below C. A reviewer also points out that a plural content noun can associate with distinct propositions: *the rumors that John is sleeping and that Mary is working*. Something similar happens with *pictures of John and Mary*, on the interpretation where no picture has both John and Mary in it. Whatever explains this will extend to CPs.

Now if *that*-clauses are predicates, this offers a natural extension to cases where the CP is a complement of a content noun as in (21). Both the CP and the content noun are type ⟨e,st⟩. They compose by Intensional Predicate Modification.

(21) ⟦*idea that Bob is a fraud*⟧ =
$\lambda x_c \lambda w$ [idea(x_c)(w) & [CONT(x_c)(w) = $\lambda w'$. Bob is a fraud in w']]

(21) denotes ideas whose content is that Bob is a fraud. This explains why *that*-clauses may combine with nouns like *idea*, which do not take any arguments, as shown in (13) (e.g., **the idea of that*).

The natural question, of course, is whether *that*-clauses elsewhere have the same type. I will show that they do, even when they complement verbs—a nontrivial consequence. To get there, I start with nominalizations. Just like content nouns such as *story* and *idea*, nominalizations derived from clause-taking verbs can be equated with *that*-clauses.

(22) His explanation/claim/belief/suspicion/remark was that Fred was a fraud.

These examples tell us quite a bit about the meaning of their underlying verbs. As with nonderived content nouns, we do not want to equate these nouns directly with propositions. Explanations can be long and boring; claims can be bold; remarks can be mean or stupid. Propositions—construed as sets of possible worlds—can be none of these. *Explanation*, *belief*, and so on must denote *things* with propositional content.

How do nominalizations of clause-taking verbs come to denote predicates of things with propositional content? As Grimshaw (1990) details, nominalizations describe a range of things: events (*the constant destruction*) or results (*the widespread destruction*). One variant of the result nominal is an ''object nominalization,'' where the nominalization describes the thing that the parent verb's object does. This is demonstrated by the equative relation in the (ii) examples in (23).

(23) a. i. I assigned Fred to fix the sink.
ii. Fred's assignment was to fix the sink.
b. i. Sue loved Edna.
ii. Sue's great love was Edna.
c. i. Bob offered just one candle.
ii. Bob's offering was just one candle.

Likewise, a large swath of clause-taking verbs (including factives and Cattell's (1978) stance verbs) form object nominalizations (Higgins 1973, Stowell 1981).[11]

[11] Nominalizations of verbs like *prove* are often cited as counterexamples (Safir 1985). *Proof* is a ''subject'' nominal. It describes the thing that does the proving. However, we will see evidence from Aktionsart diagnostics that *proof* is not an argument-taking noun, and therefore its CP complement is not an argument. Whether a CP can be postcopular depends on a variety of idiosyncratic characteristics of the noun.

(24) a. i. He admitted that he was stealing.
ii. His admission was that he was stealing.
b. i. I regret that I will be left out.
ii. My only regret is that I will be left out.
c. i. I believe that Edna was stealing.
ii. My belief is that Edna was stealing.
d. i. Andrea guessed that Bill was lying.
ii. Andrea's guess was that Bill was lying.
e. i. John claimed that he would go.
ii. John's claim was that he would go.
f. i. Paul explained that he was temporarily insane.
ii. Paul's explanation was that he was temporarily insane.
g. i. I know that they were hands off until they were ''debriefed'' . . .
ii. My limited knowledge of returning missionaries was that they were basically hands off until they were ''debriefed'' . . .
(http://exmormon.org/phorum/read.php?2,149729,149729,quote = 1)

Crucially, clause-taking verbs of various sorts select content nouns as objects.

(25) a. He believed the mean rumor.
b. I understood your silly idea.
c. Sue claimed something false.
d. I accepted/admitted/confirmed/mentioned his position/idea/claim.

And this is why when clause-taking verbs form object nominalizations, they refer to things that have propositional content. So while we typically think of these verbs as selecting propositions, the nominalization facts force a move to *things* with propositional content (see also Chierchia 1984). (Of course, this does not preclude the possibility that these verbs may also select for propositions. But the objects in (25) show that these verbs must at least select for individuals with propositional content. In the next sections, I will generalize.)

To make the proposal concrete, I assume that roots may have an internal argument and an event(uality) argument (type *l*), which includes states and events proper. The external argument is added by a separate head, v (Chomsky 1995, Kratzer 1996).[12]

(26) $[\![\sqrt{explain}]\!] = \lambda x_c \lambda e \lambda w.\text{explain}(x_c)(e)(w)\ \langle e\langle l,st\rangle\rangle$

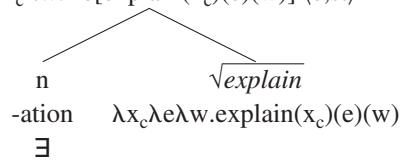
I associate nominalizing morphology *-ation/ment* with the categorizing head n (Marantz 2001). In object nominalizations, the eventuality argument is existentially closed off (Salanova 2010). We might associate this closure with the nominalizing morphology and give ∃ the denotation in (27). When the root in (26) is nominalized, it denotes things explained (28).

[12] On this proposal, attitude verbs are defined as in (i), where the attitude holder is recovered via the eventuality argument (Anand and Hacquard 2009). I will return to how this captures the semantics for a verbal attitude report with a CP complement in footnote 24.

(i) $[\![believe]\!] = \lambda x_c \lambda e \lambda w.\ \text{Dox}(\iota x[\text{Holder}(x)(e)(w)])(w) \subseteq \text{CONT}(x_c)(w)$
$\text{Dox}(\iota x[\text{Holder}(x)(e)(w)])(w) = \{w' : w' \text{ compatible with what x believes in w}\}$

(27) $[\![\exists]\!] = \lambda P \lambda x \lambda w.\exists e[P(x)(e)(w)]$

(28) nP: $\lambda x_c \lambda w.\exists e[explain(x_c)(e)(w)]$ ⟨e,st⟩



This derived nominalization can be equated with a CP just as nonderived nouns can (see (20)), deriving the sentences in (22).

The analysis naturally extends to the clausal complements of derived nouns.

(29) (I was taken aback by) his admission/belief/guess/explanation/knowledge/proposal/statement/hope/conviction that Sue was a fraud.

As with nonderived content nouns, Kratzer (2006) suggests that the CP combines with nominalizations by Predicate Modification. What is the evidence for this? This is a tougher case to make. These kinds of examples have been debated since Stowell (1981) claimed that such CPs are not arguments but phrases in apposition to the noun. Stowell's analysis has been countered by Safir (1985), Ogawa (2001), and Pesetsky and Torrego (2002). In the next section, I will show that the present analysis does make the right prediction, once diagnostics for argument-taking nouns are clarified.

2.2 Extension to Clausal Complements (of Nouns)

A nominalization can describe the eventuality that its counterpart verb does, in which case it takes arguments. These are *argument-structure nominals* (ASNs). Another kind of nominalization creates *non-argument-structure nominals* (NASNs), which describe a variety of things related to the verb. We have already encountered one type of NASN, the object nominal (e.g., *a belief*, *an assignment*). Grimshaw's (1990) discovery was that ASNs have more verbal characteristics than NASNs. One such characteristic is the ability to take Aktionsart modifiers. As (31) shows, nominalizations can exhibit the same Aktionsart distinctions as their associated verb phrases (Vendler 1967, Dowty 1979). Like *destroy*, *destruction* with a definite object is telic; *observe*/*observation* is only atelic. Crucially, as (32) shows, the Aktionsart modifier requires the internal argument.

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

(31) a. The total destruction of the city in two days/*for 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))

(32) a. *The total destruction in two days was widespread.
b. *Only observation for weeks can determine the best course of action.

According to this diagnostic, CP-taking predicates cannot form ASNs—even in the presence of a CP complement. The pairs in (33) and (34) illustrate the contrast. The nominalization with a

CP complement in (34b) cannot accept an Aktionsart modifier, unlike the nominalization with a DP complement in (33b).

(33) a. We observed the butler for several weeks.
b. Observation of the butler for several weeks is needed.

(34) 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.

The use of *observe* that takes a clause forms only an NASN. This is an entirely systematic property of CP-taking predicates when nominalized.

(35) a. I decided that he was a fraud *in 5 minutes*.
b. *my decision that he was a fraud *in 5 minutes*
c. *my decision *in 5 minutes* that he was a fraud

(36) 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

(37) 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

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

(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

According to Aktionsart diagnostics, then, clause-taking nouns do not form ASNs.

I should pause here to address another diagnostic for ASNs. Grimshaw claims that singular ASNs may be modified by *frequent* and *constant* (40). NASNs must be plural (41) to take these modifiers.

(40) The constant assignment of unsolvable problems is to be avoided. ASN

(41) a. Frequent/Constant assignments annoyed the students. NASN
b. *The constant assignment is to be avoided. NASN

Pesetsky and Torrego (2002) offer (42) as evidence that CP-taking nouns form ASNs: *claim* accepts *frequent*/*constant* and requires its CP complement.

(42) His frequent/constant claim *(that he was about to resign annoyed us).
(Pesetsky and Torrego 2002:531n22, (iia)/(iiia))

It turns out, though, that *frequent* and *constant* are just not good diagnostics for ASNs. In fact, Grimshaw herself notes the NASN in (43a) modified by *frequent*. Other examples are easy to find.

(43) a. Only frequent examination by the doctors kept John healthy. (Grimshaw 1990:178n1)
b. More frequent demonstration is required.
c. The constant construction next door will bother me.
d. Frequent change is necessary if you want to stay competitive.

We must recognize in (43) members of a third type of nominalization identified by Grimshaw: *simple event nominals* (SENs) (Borer 2003, Alexiadou 2009). SENs describe the same eventuality as their verbal counterparts,[13] but they do not take arguments (44).

(44) a. His demonstration was too long. SEN
b. The construction lasted for years. SEN
c. Change takes a long time. SEN

Correlatively, SENs do not accept Aktionsart modifiers.

(45) a. *Construction for/in five months lasted a long time. SEN
b. *Observation for several weeks is required. SEN
c. *Examination by the doctors for hours kept John healthy. SEN

SENs are a subtype of NASNs. Nonetheless, as (43) shows, SENs *can* be modified by *frequent* and *constant*.

What about Pesetsky and Torrego's (42)? If this really involves an SEN, why should the CP be obligatory? What makes SENs good with *frequent*/*constant* has to do with how available the context makes the internal argument. This is true, I think, for Grimshaw's (43a). And as long as there is a proposition in a preceding discourse, Pesetsky and Torrego's examples improve, even without a CP complement.

(46) A: The constant belief that someone is trying to poison you is a sure sign of insanity, don't you think?
B: Yes, that/such a constant belief is a sure sign of insanity.

(47) Don't forget that the liberals still claim that it was the fault of all the idiots that voted for him. That constant claim by the liberals still sticks in my mind. (http://www.freerepublic.com/focus/f-news/1627062/posts)

CP-taking nouns can form SENs, but like object nominalizations, SENs do not take arguments as verbs or ASNs do (see footnote 11 on *proof*).

To summarize, clause-taking nouns do not form ASNs. That means that their CP complements cannot be arguments. They must combine in some other way, and that is exactly what the predicative analysis of *that*-clauses predicts. The clause-taking root forms a (non-argument-taking) object nominalization (type ⟨e,st⟩, (28)) that combines with the CP by Predicate Modification just as nonderived nouns do (21). More evidence for this idea can be found elsewhere, including syntactic

[13] SENs should be distinguished from result nominals, which denote a resulting eventuality. For instance, the result interpretation of *construction* can refer to a mass of buildings, but the SEN in (43c) refers to events of constructing.

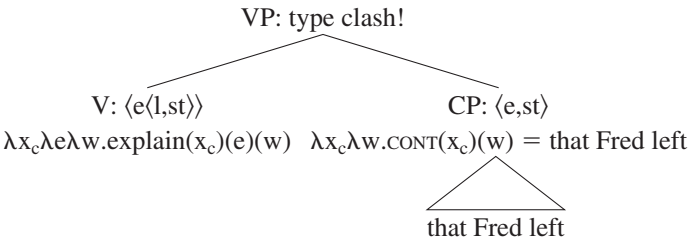
evidence from reconstruction effects in Moulton 2013, which shows that CP complements of nouns may bleed Condition C in the way that modifiers do (cf. Van Riemsdijk and Williams 1981, Freidin 1986).

CP proforms, on the other hand, do serve as arguments. That is why they cannot combine with non-argument-taking nouns/nominalizations. They saturate, which suggests that they are type *e* (individuals with propositional content). If they combine by Function Application with an NASN, this returns a proposition, not the semantic type of a common noun, and they are therefore ruled out.

(48) a. *the claim/belief/guess/explanation so
b. *$[\![[_{nP}$ explanation so$]]\!]$ = $\lambda w \exists e.\text{explanation}(so)(e)(w)$ $\langle s,t\rangle$

Nominalization has taught us something very important about *that*-clauses: they do not saturate, but CP proforms do. The explanation I have offered here gives *that*-clauses a predicative semantic type. This conclusion, of course, has implications for CP complements of verbs. If clause-taking verbs select for terms of type *e* (individuals with propositional content), and we limit ourselves to standard modes of composition, *that*-clauses will not combine with verbs, as (49) illustrates.[14]

(49)



At this point, one can imagine many possibilities. Maybe clause-taking verbs select propositions after all? That seems unlikely given the above evidence: the kinds of object nominalization formed by clause-taking verbs suggest that their internal arguments denote individuals with propositional content. Furthermore, the null hypothesis is that *that*-clauses have a uniform denotation across environments.[15] One temptation, of course, is to shift the denotation of *that*-clauses when

[14] Chung and Ladusaw (2004) argue for a mode of composition, Restrict, which combines these very types. Indeed, this was the route Kratzer (2006) initially took to compose V and her CPs. Here I take a different route—movement—which I believe is worth exploring for its syntactic predictions. Needless to say, Kratzer's (2006) conjecture about CPs should be kept distinct from the syntactic claims about it that I am making here.

[15] The distribution of null complementizers is often used to separate CP complements of V and A from CP complements of N (Stowell 1981, Pesetsky and Torrego 2002). But naturally occurring examples of CP complements of N with null Cs are plentiful.

(i) a. The fact there was no bus made it more acceptable.
(http://www.csnchicago.com/pages/hawktalk)
b. . . . in the belief he was buying a kilo of skunk cannabis
(http://www.bedfordshire.police.uk/ . . . /280610_luton_drug_deal.html)

Judgments are variable here, which contrasts sharply with the obligatory nature of *that* in sentential subjects (**(That) Sue left surprises me*). In distinguishing sentential subjects on the one hand from complements of N, V, and A on the other, the present proposal divides the phenomena in the right place.

they serve as verbal complements. Maybe a null determiner lowers a *that*-clause to type *e*. That's not the right solution, though, since it will neutralize the category difference between DP and CP complements. Basic facts about the distribution of *that*-clauses militate against treating them covertly as DPs (Emonds 1972).

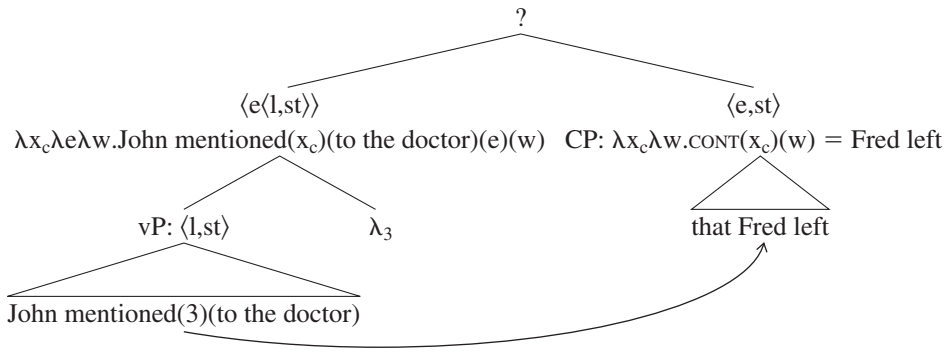
(50) a. *John complained/boasted/agreed/convinced me that.
b. John complained/boasted/agreed/convinced me that Fred left.

(51) a. Sue is aware (*of) that Fred left.
b. Sue is aware of that fact.

Another option would be to shift the verb, so it would take a property-type complement (see, e.g., Carlson 1977, Van Geenhoven 2000). But I know of no evidence for this. In fact, there is little semantic evidence on which to conclude what compositional mechanism is at work.

Here we must look toward the syntax. The grammar offers another way to resolve type mismatches: movement. And there is plenty of syntactic evidence that clausal complements do undergo a little movement. As noted in section 1, complement clauses (obligatorily) extrapose rightward, which in German (15) puts the CP on the right side of the verb. The order of complements in English also suggests that CPs move rightward (Stowell 1981). Perhaps this movement resolves the type clash? CP-extraposition could leave a trace (the index *3* in (52)) that denotes an individual with propositional content, type *e*, which saturates the verb.[16]

(52)



While this resolves the type clash in the complement position, it creates another one. In its landing site, the CP is sister to a node of the same type as the verb root, which created the type clash in the first place. So, movement of the *that*-clause will not alone resolve the type clash.

Over the last decade and a half, it has been argued that the syntactic derivations that position CP complements are more complex. Clausal complements indeed move, but leftward, followed by remnant movement of the verb phrase. In the next section, I will review the evidence for this syntax. Then we will see that such movements actually resolve the type clash too. The strength of the proposal lies in the way the syntax and the semantics corroborate each other.

[16] See Heim and Kratzer 1998 for this method of interpreting movement.

3 A Remnant Analysis of CP Complements

3.1 CP Distribution

The salient fact about CP arguments is that they appear in a position distinct from other complements. Stowell (1981) shows this for English by restricting attention to the order of complements in gerundives.[17] CP arguments, unlike DPs, must appear after other arguments (53) and verbal modifiers (54).

(53) 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))

(54) 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?

CPs must appear after extraposed relatives, too (55).

(55) a. Sally convinced [$_{\text{Rel}}$ a man who could fix the problem] of coming.
b. Sally convinced a man$_i$ of coming [$_{\text{Rel}}$ who could fix the problem]$_i$.
c. Sally convinced [$_{\text{Rel}}$ a man who could fix the problem] that he should come.
d. *Sally convinced a man$_i$ that he should come [$_{\text{Rel}}$ who could fix the problem]$_i$.

As mentioned, in OV languages the asymmetry between CP and other complements is even more striking (on Farsi, see Farudi 2007; for Hindi, see Subbarao 1984). As many have pointed out, however, rightward extraposition cannot be responsible for positioning clausal complements. Extraposition should render a phrase opaque to extraction, and yet clausal complements are transparent for extraction in English, and in German (56).

(56) (Ich weiß nicht) wen$_1$ er gesagt hat [$_{\text{CP}}$ dass Claudia t_1 geküsst hat].
I know not whom he said has that Claudia kissed has
'I don't know who he said that Claudia has kissed.'
(Müller 1998:145, (58a))

Under some circumstances, CPs can appear to the left of the verb, but here they are opaque for extraction (57).

(57) *(Ich weiß nicht) wen$_1$ er [$_{\text{CP}}$ dass Claudia t_1 geküsst hat] gesagt hat.
I know not whom he that Claudia kissed has said has
'I don't know who he said that Claudia has kissed.'
(Müller 1998:146, (58b))

Furthermore, Webelhuth (1992:107) reports that CPs in this sentence-internal position show the telltale signature of the DP requirement, meaning that what is moved is not a CP but a DP. Not

[17] For independent reasons, gerundives appear to block further rightward shift and so reveal a more faithful picture of the base order of complements (Stowell 1981).

only does the contrast between (57) and (56) cast doubt on extraposition, it highlights that the rightward position of CPs cannot be due to pressures against center-embedding alone.

Binding effects cast further doubt on rightward extraposition (Zwart 1993; cf. Büring and Hartmann 1997). Datives in the matrix clause c-command into CP complements, binding variables and creating Condition C violations.

(58) a. . . . weil der Direktor [jeder Putzfrau]$_i$ persönlich mitteilte [dass sie$_i$
. . . because the director each cleaning.lady personally told that she
entlassen sei].
fired was
‘. . . because the director told each cleaning lady$_i$ personally that she$_i$ was fired.’

b. * . . . weil der Direktor ihr$_i$ persönlich mitteilte [dass die Putzfrau$_i$
. . . because the director her personally told that the cleaning.lady
entlassen sei].
fired was
‘. . . because the director personally told her$_i$ that the cleaning lady$_i$ was fired.’
(Bayer 1995:56, (17a–b))

Zwart (1993) and others working in an antisymmetry framework (Kayne 1994) take the extraction and binding facts to support the Base Analysis, which strands the CP in complement position (assuming a VO base) and moves other arguments left of the verb. But the Base Analysis analysis cannot be quite right either. For one, CPs follow higher verbal heads, like auxiliaries.

(59) a. . . . weil er gesagt hat [$_{CP}$ dass Claudia Hans geküsst hat].
. . . because he said has that Claudia Hans kissed has
‘. . . because he said that Claudia kissed Hans.’

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

Hinterhölzl (1999) provides a strong empirical argument for an alternative derivation that involves leftward movement of the CP out of its selecting phrase, followed by remnant movement of that phrase (see also Koopman and Szabolcsi 2000:136–137, for Dutch). Hinterhölzl shows that this is the only way to accommodate the following pattern with CP complements of adjectives in German:

(60) a. . . . ohne [$_{AP}$ froh] zu sein, dass der Hans nicht kam.
. . . without happy to be that the Hans not came
‘. . . without being happy that Hans did not come.’

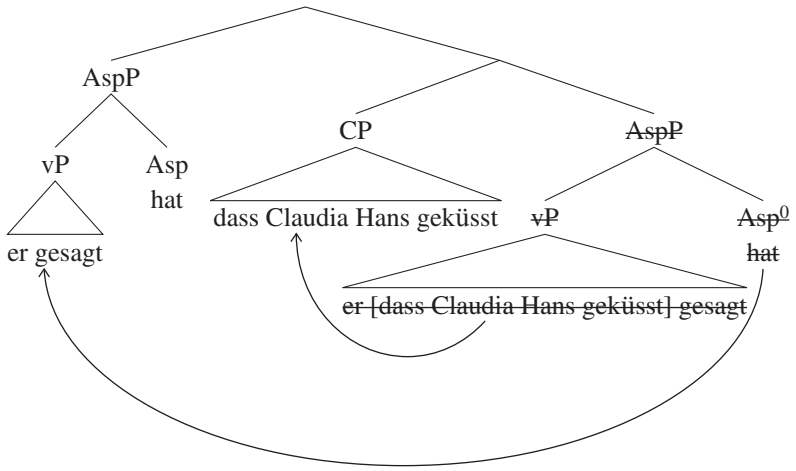
b. * . . . ohne [froh dass der Hans nicht kam] zu sein.
. . . without happy that the Hans not came to be
(Hinterhölzl 1999:101, (25))

c. [[$_{AP}$ froh t_{CP}] zu sein [$_{CP}$ dass der Hans nicht kam] [t_{AP}]]

Hinterhölzl first argues that the position of the adjective in (60a) is a result of AP-movement to the left of the infinitival marker *zu*. But the CP cannot front with the AP (60b). This is unexpected

on the Base Analysis. The only derivation that can produce (60a)—aside from a rule of rightward extraposition, which we saw was inadequate for other reasons—is a remnant analysis, as shown in (60c). The CP must be forced to evacuate the AP before the latter fronts. Hinterhölzl was assuming that *sein* 'be' selects the AP to its right, and the surface order is derived by AP-movement. We do not need to adopt antisymmetry assumptions like these to appreciate why remnant movement is needed. Assuming, as I will hereon, that the German VP is right-headed, (60a) must involve leftward movement of the CP out of the *sein*-phrase, followed by remnant movement of [t_{CP} froh zu sein]. Extending this to (59a), the remnant that moves leftward must be larger than the verb phrase. I identify it in (61) as Aspect Phrase (AspP).

(61)



Somewhat similar derivations for CP complements have been advocated in Kayne 2005. In the next section, I will add another piece of evidence from English to support this remnant movement.

3.2 Further Evidence for a Remnant Analysis of CP Position

CP complements, unlike other truly extraposed constituents, have an effect on the verb phrase that is unexpected if CP complements remained in situ or merely extraposed rightward: they prevent P-stranding from within the VP they move out of (62) (Stowell 1981, Wexler and Culicover 1981).[18] Heavy NP shift (HNPS) has the same effect (63).

(62) a. *Who did you say to that I would buy the guitar?
b. *Who will Andrew disclose to that he is married?
(Stowell 1981:208, (177))

[18] These examples were first cited as one kind of violation of the Clause Nonfinal Incomplete Constituent Constraint (Kuno 1973:381).

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

Compare with pied-piping (64a) and indirect objects (64b).

(64) a. To whom did you say that I would buy the guitar?
b. Whom did John tell that he would buy the guitar?

However, unlike *that*-clause complements and HNPS, CP-extraposition from NP—of either complements or relatives—does not produce the P-stranding effect (Drummond 2009).

(65) a. Who did you give the impression to [$_{CP}$ that you were happy]?
b. Who did you give the book to [$_{CP}$ that Mary wanted]?

All of this suggests that the kind of syntax that positions *that*-clauses must be similar to HNPS, not CP-extraposition from NP. So this is yet more evidence against the extraposition of CP complements. Moreover, the syntax for HNPS and CPs must be responsible for the P-stranding constraint. One account of HNPS that may offer a purchase on the P-stranding constraint is Den Dikken's (1995) remnant movement analysis, in which the heavy-shifted DP moves leftward, followed by remnant verb phrase movement.

(66) a. I gave to John all the books in the library.
b. [[$_{VP}$ gave t_{DP} to John] [[$_{DP}$ all the books in the library] t_{VP}]]

This is, of course, a derivation nearly identical to that proposed by Hinterhölzl (1999) for CPs. It seems reasonable, then, to think that VP/AspP-movement is responsible for the P-stranding constraint. While the true source of the P-stranding constraint deserves more space than I can afford it here, I want to sketch why remnant movement should be held responsible, and therefore why these data serve as further evidence for the remnant account for CPs. Relevant here is the fact that if the PP follows the shifted NP or *that*-clause, stranding is improved, especially if P is emphasized.

(67) a. ?Who did you say, after the speech, that I would buy the guitar TO ____?
b. *Who did you say to ____ , after the speech, that I would buy the guitar?

(68) a. Who should he not send at any point a book of poems TO ____?
b. *Who should he not send to ____ at any point a book of poems?

I take (67) and (68) as showing that P-stranding is possible if the PP itself ''extraposes'' (using that term just descriptively now). German confirms that extraposed PPs are indeed transparent for extraction (69a), as they are in situ (69b).

(69) a. Wo$_1$ hat keiner t_2 gerechnet [$_{PP}$ t_1 mit]$_2$?
what has no.one counted with
'What has no one taken into account?'
(Müller 1998:152, (70a))

b. Wo$_1$ meinst du [$_{CP}$ t$_1$ dass keiner [$_{PP}$ t$_1$ mit] gerechnet hat]?
what think you that no.one with counted has
'What do you think that no one has taken into account?'
(Müller 1998:152, (68b))

(The transparency of ''extraposed'' phrases will again be important when we turn to the transparency of CPs in section 5.) On the remnant account of HNPS and CPs, the VP/AspP moves leftward. Extraction is not possible from the remnant VP/AspP; but it is possible from the PP only if that PP first escapes the remnant.

(70) Who$_1$ did you [[$_{AspP}$ say t$_{PP}$ t$_{CP}$] [[$_{CP}$ that I would buy the guitar] [$_{PP}$ to t$_1$] [t$_{AspP}$]]]?

The surface effect is extraction from an extraposed PP, as in (67)–(68).[19]

How does this explain the P-stranding effect in (62)? The question is why a *wh*-DP cannot by itself first undergo HNPS out of AspP (before AspP fronts), stranding P and deriving (62a), as in (71).

(71) *Who$_1$ did you [[$_{AspP}$ say to t$_1$ t$_{CP}$] [[that I would buy the guitar] t$_1$ [t$_{AspP}$]]]?

Here the other, more famous P-stranding constraint connected with HNPS is relevant. HNPS cannot strand Ps (Larson 1988).

(72) *We talked to about Joan's problems all of her teachers.

The source of this famous restriction remains unknown (see Drummond, Hornstein, and Lasnik 2010 for recent discussion). For present purposes, it is enough to see that the P-stranding constraint in (62)/(63) can be reduced to the one in (72): both involve stranding P in a VP that undergoes further movement. Only the remnant analysis allows for this kind of unified account. When a *wh*-phrase undergoes HNPS but does not strand a P, it may continue to move leftward. This is exactly what we find with indirect objects, as in (64b).[20] We further predict that if the *wh*-word does not use HNPS to first escape the remnant VP, a P-stranding violation will not result. As a reviewer points out, (73) is an improvement over (62a).

(73) ?Who did you say to the brother of that you would buy the guitar?

Here the movement that lets the *wh*-word escape the remnant cannot be HNPS—it is embedded within the DP *the brother of*. So we do not expect the P-stranding constraint to apply here. In sum, not only does giving CPs and HNPS the same derivation make sense, the remnant derivation may help capture the P-stranding effects exhibited by both.

[19] The following derivation needs to be ruled out. If PP scrambles in front of CP, followed by subsequent remnant AspP-movement, then (62a–b) are incorrectly derived. I suspect this derivation is grammatical but processing (late closure) makes it difficult to parse the PP outside AspP.

[20] This derivation needs to be blocked in more familiar cases of VP-fronting in German, where *wh*-movement is not possible from scrambled VPs. The obvious difference is the type of VP-movement involved. See Müller 1996 on constraints of this nature.

P-stranding provides more evidence for likening HNPS and *that*-clauses. Like heavy-shifted DPs such as the one in (72), *that*-clauses in English can never be selected by prepositions.

(74) We insisted (*on) that John come.

Since *that*-clauses must undergo remnant-creating movement to be interpreted and this remnant-creating movement cannot strand Ps, P will never be able to select *that*-clauses.

Pseudogapping provides a further argument. HNPS is one of the operations that licenses pseudogapping (Jayaseelan 1990); see (75a). CPs can be the remnants in pseudogap constructions too ((75b) from Baltin 2003:225n6).

(75) a. Though John wouldn't suppress his anger, he would his fatigue.
b. Though John wouldn't complain that he's angry, he would that he's tired.

Complain does not select DPs (see section 1), so it must be short CP-movement that creates the elidable VP constituent deriving pseudogapping.

In summary, the syntactic evidence shows that when verbs take *that*-clause complements, both the CP and the remnant verbal material move leftward. And this analysis is preferable to the two plausible, but ultimately inadequate, alternatives for the placement of CP complements: Zwart's (1993) Base Analysis and a classical rightward extraposition analysis (Koster 1978, Stowell 1981, Büring and Hartmann 1995). Since we have a target syntax, we can now return to the semantic composition. I will show that the remnant analysis resolves the type clash identified in section 2.2 and ultimately leads to an explanation for the question we began with: why do *that*-clauses not move very far leftward?

4 How *That*-Clauses Fulfill the Projection Principle

4.1 Compositional Interpretation of Movement

When a phrase moves, it can leave an element of a different semantic type. For instance, the quantifier in (76a) can leave a trace that denotes a bound variable. This is handled in the copy theory (76b) by Trace Conversion (Fox 2002).

(76) a. Every square is not round.
b. ⟨every square⟩ is not ⟨every square⟩ round

Trace Conversion replaces the quantificational determiner of lower copies with a definite determiner, THE, and then inserts a variable indexed with the moved term by way of an identity predicate that intersects with the denotation of the restrictor NP. The result is a trace-converted phrase of type *e*.

(77) *Trace Conversion* (Fox 2002)
a. Determiner Replacement: $[_{QP}$ every square$]_1 \rightsquigarrow [_{QP}$ THE square$]_1$
b. Variable Insertion: $[_{QP}$ THE square$]_1 \rightsquigarrow [_{QP}$ THE [λx.x is a square & λy.y = 1]]

(78) a. Every square is not round.
b. ⟨every square⟩ is not ⟨every square⟩ round → Determiner Replacement
c. ⟨every square$_1$⟩ is not ⟨THE square⟩ round → Variable Insertion
d. ⟨every square$_1$⟩ is not ⟨THE x such that x is a square and x = 1⟩ round

Trace Conversion is designed for DPs. Now for those CPs that appear to leave DP category gaps (see section 1), a Trace Conversion approach may be appropriate (Takahashi 2010). But as the pseudogapping example (75b) shows, *that*-clauses must be able to move a little and leave CP gaps. Moreover, CP proforms move, as shown in (5), and they (or their associated CP null operators) do so in a way that is semantically interpreted to create an operator-variable chain (Potts 2002). So we must allow lower copies to denote variables without converting those lower copies to DPs. Category-Neutral Trace Conversion (CNTC) in (79), modeled in part after proposals in Sauerland 2004, keeps the semantics of Trace Conversion without the commitment to category. A process of Quantifier Removal applies (if there is a quantifier). The second step coordinates how the index and the restrictor combine.

(79) *Category-Neutral Trace Conversion*
a. Quantifier Removal: $[_{DP}$ every square$]_3 \rightsquigarrow [_{DP}$ square$]_3$
b. Index Interpretation: $[_{DP}$ square$]_3 \rightsquigarrow [_{DP}$ 3: 3 is a square]

(80) $[\![[_{DP}$ 3: 3 is a square$]]\!]^g = g(3)$ iff $[\![\text{square}]\!](g(3)) = 1$; undefined otherwise

The output of Index Interpretation is shorthand for the semantics, which interprets the index as a restricted variable as in (80) under an assignment function *g*. The net result is almost identical to the result of standard Trace Conversion, but it does not carry commitments to syntactic category.[21]

The application of CNTC to *that*-clauses is straightforward (81), as is the resulting semantics (82).

(81) *Category-Neutral Trace Conversion applied to CPs*
a. Quantifier Removal: (N/A)
b. Index Interpretation: [that Bob is a fraud]$_3 \rightsquigarrow$ [3: 3 is that Bob is a fraud]

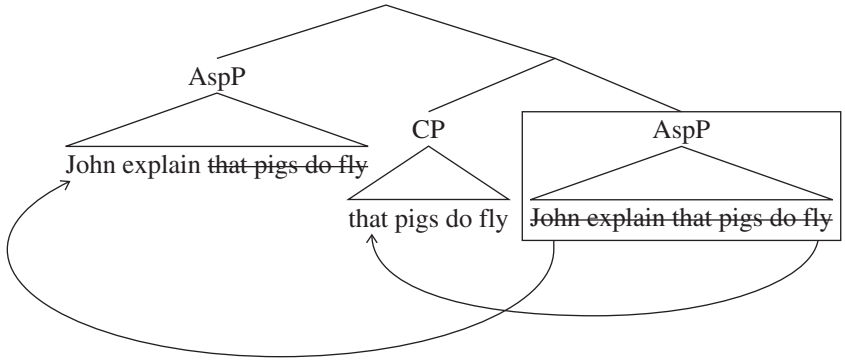
(82) $[\![[_{CP}$ 3: 3 is that Bob is a fraud$]]\!]^g = g(3)$ iff $[\![\text{that Bob is a fraud}]\!](g(3)) = 1$; undefined otherwise
$[\![\text{that Bob is a fraud}]\!](g(3))(w) = 1$ iff $[\text{CONT}(g(3))(w) = \lambda w'.\text{Bob is a fraud in } w']$

This means that when a CP moves leftward, its lower copy denotes in type *e* and saturates the verb (I return in section 4.2 to why the type-repairing movement is overt). This constitutes the first component of the proposal.

Recall though that this movement is not enough to resolve a type clash (see (52)). But we learned that the syntax is more complex anyway. AspP moves, too, as illustrated in (83).

[21] The fact that Trace Conversion only applies to DPs is sometimes cited as a virtue; it ensures that VP-fronting, for instance, is ''semantically vacuous'' (Huang 1993). However, if a lower VP copy undergoes CNTC, it will denote a restricted event variable. This will not let it compose with higher functional heads, which require properties of events (or times), not individual events.

(83)



To interpret this tree, we must ask what the semantic pieces are. The head of AspP is the verbal functional head Viewpoint Aspect (Smith 1991), which is a quantifier over events. It locates the running time of an event with respect to a reference time *t* (Klein 1994). Here are some standard denotations for aspectual heads of different values (Kratzer 1998):[22]

(84) a. $[\![\text{perfect}]\!] = \lambda P_{\langle l,st\rangle}\lambda t\lambda w.\exists e[P(e)(w) \,\&\, \tau(e) < t]$ $\langle\langle l,st\rangle,\langle i,st\rangle\rangle$
b. $[\![\text{perfective}]\!] = \lambda P_{\langle l,st\rangle}\lambda t\lambda w.\exists e[P(e)(w) \,\&\, \tau(e) \subseteq t]$ $\langle\langle l,st\rangle,\langle i,st\rangle\rangle$
c. $[\![\text{imperfective}]\!] = \lambda P_{\langle l,st\rangle}\lambda t\lambda w.\exists e[P(e)(w) \,\&\, \tau(e) \supseteq t]$ $\langle\langle l,st\rangle,\langle i,st\rangle\rangle$

Since Aspect is a kind of quantifier, we should look to the behavior of other overtly moved quantifiers. Take *wh*-movement. A *wh*-word pied-pipes its complement, but the semantics interprets the various pieces in different copies. This familiar profile of *wh*-movement, schematized in (85b–c), accounts for the bound variable interpretation in (85a).

(85) a. Which book about him_i should nobody_i read?
b. $[_{DP}$ which book about $\text{him}_i]$ should nobody_i read ~~$[_{DP}$ which book$]$~~ PF
c. $[_{DP}$ which$]$ λ_1 should nobody_i read $[_{DP}$ 1 book about $\text{him}_i]$ LF

The quantificational *wh*-word is interpreted in the high copy, while its NP restrictor/complement is interpreted in the low copy (Chomsky 1995). That is, pied-piped constituents are interpreted as though they never moved (von Stechow 1996). Aspect movement has a similar profile. The vP is pied-piped with the Aspect head, but it is interpreted low. The Aspect head is interpreted high, binding a variable in the lower copy.

(86) a. $[_{AspP}$ Asp^0 VP$]$ . . . ~~$[_{AspP}$ Asp^0 VP$]$~~ PF
b. $[_{AspP}$ $Asp^0]$ λ_{2_l} . . . $[_{AspP}$ 2_l VP$]$ LF

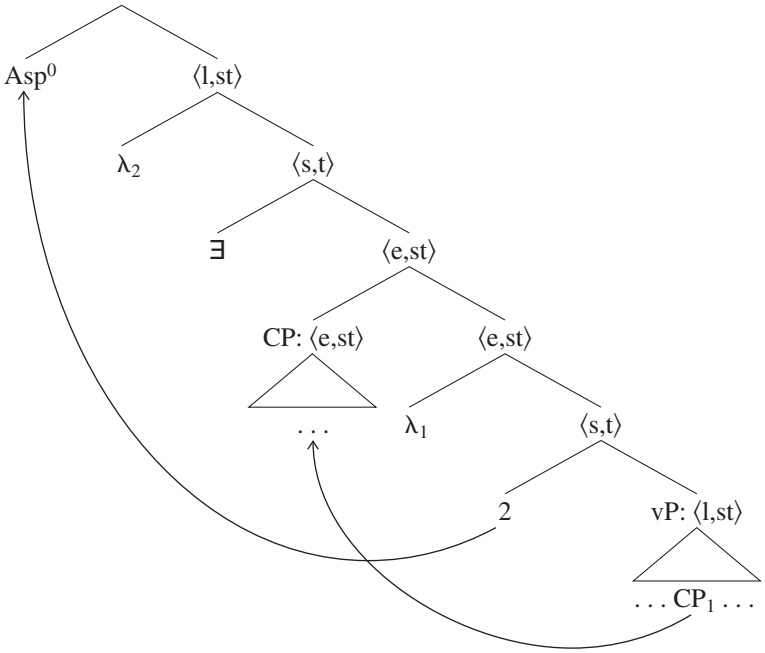
Consider, now, how such a structure is interpreted. Like a quantifier, Asp^0 leaves a low-type variable, which in its case denotes an event. This bound event variable can saturate the event argument slot of the vP, which returns a node of type $\langle s,t\rangle$. This is not an innovation: Hacquard

[22] I must leave to future research the exact morphological spell-out of Asp. I do not wish to suggest that the denotation for perfect in (84a) corresponds one to one with auxiliary *haben* 'have' in German, for instance.

(2006) and Kim (2007) argue for Aspect movement for independent reasons.[23] Now, we have seen that the syntax moves the *that*-clause to the position between the launching and landing sites of AspP. Here it triggers Predicate Abstraction. Given that the event argument is saturated, this Predicate Abstraction will give the CP a sister of type ⟨e,st⟩—a node with which it can combine by Predicate Modification as in (88). I assume Existential Closure (EC) is available at the edge of verbal phrases (Diesing 1992) to close off the content argument x_c. I will implement EC as ∃, defined in (87).

(87) $[\![\exists]\!] = \lambda P_{\langle e,st\rangle}\lambda w.\exists x[P(x)(w)]$

(88)

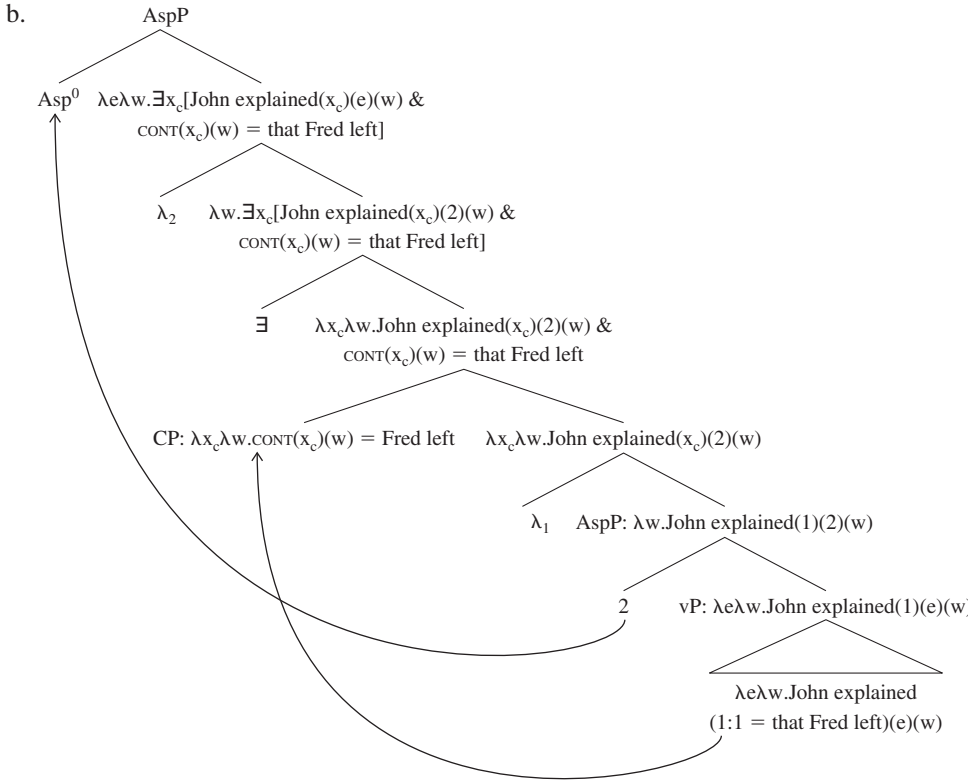


A full composition is given in (89b) (I omit the restriction of the lower CP copy for brevity in higher nodes).

[23] There have been similar claims about the semantic effects of head movement (Lechner 2006, Szabolcsi 2010). Von Stechow (2002), following Heim (2001), argues that attitude verbs are verbal quantifiers.

(89) a. John explained that Fred left.

b.



To recap, through two applications of movement (along with the attendant effects of CNTC and predicate abstraction), there is a node that denotes just the thing *that*-clauses can combine with. Essentially, we have created a noun meaning (a property) out of the verb phrase by ''temporarily'' saturating the vP's event argument. Copy theory allows one *that*-clause to simultaneously compose in two different ways: one copy saturates the verb, as is required by the Projection Principle, and the other copy modifies a node of the same type, as is required by the basic type of *that*-clauses.[24] The type clash is resolved, and in a way that is reflected in the overt syntax. Indeed, the fact that the movements resolve the type clash provides a motivation for the remnant movement proposed by Hinterhölzl (1999). Like work that uses complex movements to derive word orders (Kayne

[24] The semantics of an attitude ascription remains standard (Hintikka 1969).

(i) John believes that Fred left. (evaluated at w_0)
  a. $\exists e \exists x_c$[Holder(John)(e)(w_0) & believes(x_c)(e)(w_0) & CONT(x_c)(w_0) = Fred left]
  b. Dox(ιx[Holder(x)(e)(w_0)])(w_0) ⊆ CONT(x_c)(w_0)
    ∴ Dox(John)(w_0) ⊆ {w′: Fred left in w′}

1994), Hinterhölzl's remnant account invokes movements whose motivation might be held suspect. The present remnant analysis, however, motivates the movements: they are type-driven.

I will next demonstrate how the account explains the apparent immobility of *that*-clause arguments, in comparison to other arguments including CP proforms.

4.2 Why That-*Clauses Move No Further*

Recall that we began with a puzzle about the difference between *that*-clauses and CP proforms. The paradigm is repeated here:

(90) a. my belief/claim/fear that pigs fly
b. *my belief/claim/fear so

(91) a. *That the results were fantastic, Albert boasted/commented/complained.
b. So it seems.

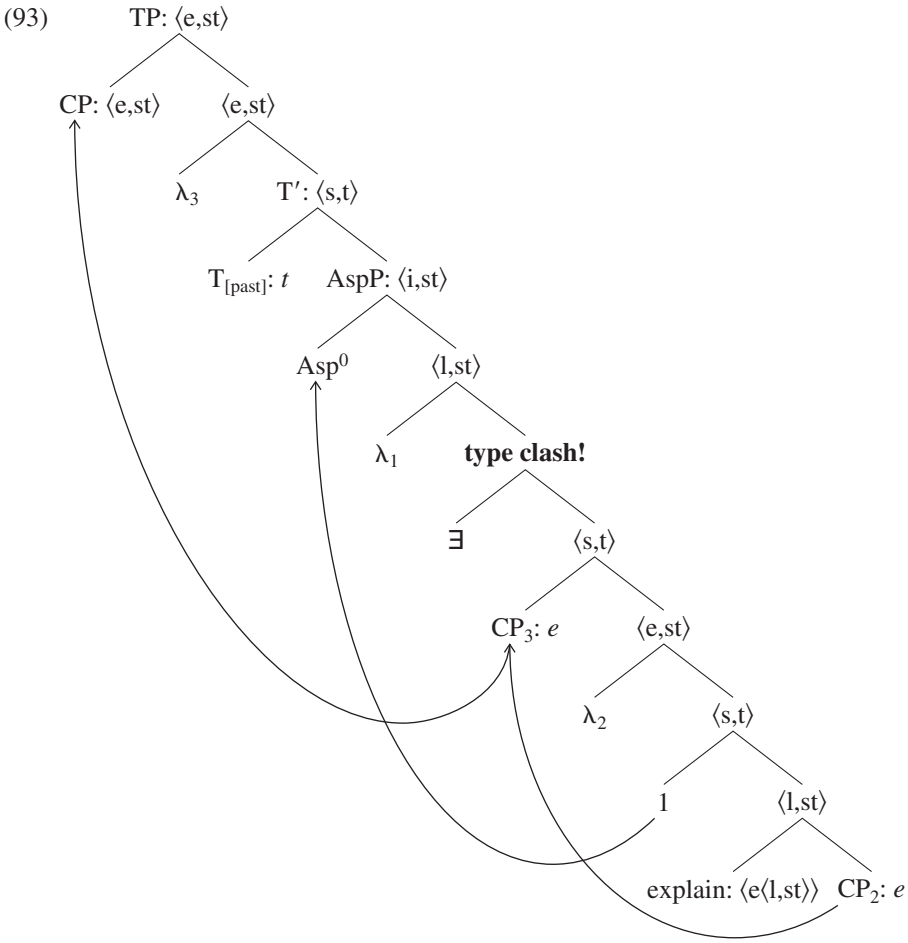
The contrast in (90) has been explained by (a) the fact that clause-taking nouns only form NASNs and (b) the proposal that CP proforms saturate, while *that*-clauses modify, which allows the latter but not the former to combine with NASNs. Now I want to show how the movement contrast in (91) follows from the same basic difference, coupled with the derivation proposed in (89). One ingredient is the well-documented fact that EC (shown as ∃ in (89)) sits at the edge of the verb phrase (Diesing 1992). This explains why the *that*-clause moves only as low as it does; if it moved further, and did not fall under EC, the composition would fail.[25]

Further movement is ruled out, too. Take the derivation in (93), where the *that*-clause moves further to, say, Spec,TP. CNTC will convert the intermediate copy to type *e*. But this creates a type clash, because it gives ∃ (whose denotation I repeat in (92)) a sister of the wrong type.

(92) $[\![\exists]\!] = \lambda P_{\langle e,st\rangle}\, \lambda w.\exists x[P(x)(w)]$

[25] A reviewer asks why ∃ is not available lower, that is, just above V. It may well be, but that will not resolve anything here. Asp^0 must be merged and moved to derive something of type ⟨e,st⟩ for the CP to modify. This will force the CP higher than the Merge position of Asp^0.

(93)



There is one other derivation to consider, in which the CP undergoes semantically vacuous movement from this intermediate position. Semantically vacuous movement (sometimes described as movement that undergoes *total* or *radical reconstruction*) would allow the CP to move to subject or topic position, but be interpreted just below EC. (The dotted arrow indicates semantically vacuous movement.)

(94) [CP . . . ∃ [$CP_{\langle e,st\rangle}$ . . . CP_e]]

This derivation composes semantically, so what rules it out? This is a question that all accounts of CPs that I am aware of must face. To rule out semantically vacuous CP movement, Takahashi (2010) suggests the following general principle of economy: semantically vacuous movement is blocked for a phrase if that phrase can also undergo semantically nonvacuous movement. However,

it is hard to reconcile Takahashi's idea with the fact that DPs can undergo both semantically vacuous and semantically nonvacuous movement (think scope ambiguities with A-moved quantified DPs).

The present proposal, however, offers a natural way to approach the issue. It does so by appealing to the likeness between *that*-clauses and bare nominals (BNs). In semantic type, our *that*-clauses most resemble certain weak indefinites (see, e.g., Van Geenhoven and McNally 2005 on property-type indefinites). BNs often resist movement outside of EC. For instance, BNs in Italian can receive an existential interpretation in object position, but not subject position (95).[26] Singular BNs in Catalan are possible as objects of certain verbs (96a), but they cannot be moved to subject position (96b).

(95) a. Ho preso acqua dalla sorgente.
I.have taken water from.the spring
'I took water from the spring.'
b. *Acqua viene giù dalle colline.
water comes down from.the hills
(Longobardi 1994:616, (14))

(96) a. M'acabo de comprar cotxe.
REFL.finish.1 of buy car
'I just bought myself a car.'
b. *Pis ha estat comprat.
apartment has been bought
(Espinal and McNally 2011:101, (26a), (29a))

If these BNs get their existential interpretation by being interpreted below ∃, then they must be prevented from undergoing semantically vacuous movement outside of ∃.[27] The crosslinguistic tendency for weak indefinites and BNs to stay low is one that Diesing's (1992) Mapping Hypothesis exploited—for instance, for scrambling of indefinites in Dutch and German. Of course, as we now know, a strong version of Diesing's program cannot be sustained: some weak indefinites do scramble (see, e.g., Dayal 2004), and not all of Diesing's other evidence has held up. But there is nonetheless good evidence that semantically vacuous movement, just like QR (Quantifier Raising), may be the more marked option. Invoking Szabolcsi's (1997:111) motto that many languages

[26] Focused (ia) and clitic left-dislocated (ib) BNs are possible.

(i) a. POLLO io voglio, non pesce.
CHICKEN I want not fish
'Chicken I want, not fish.'
b. Studenti, ne ho molti.
students of.them I.have many
'I've got many students.'
(Chierchia 1998:384, (73a–b))

I return below to the relevance of the clitic left-dislocated examples for CPs.

[27] One popular explanation for restrictions of this sort (Longobardi 1994 et seq.) is that BNs are headed by null determiners that must be governed, hence not licensed in subject position. Espinal and McNally (2011) argue that this will not cover the Catalan cases: if there were a null D heading these complements, such BNs would be expected to appear freely as verbal complements, but this is not the case.

wear ''their LF on their sleeves,'' Bobaljik and Wurmbrand (2012) have argued for a universal but violable constraint that requires a correspondence between scope and word order. This idea has been expressed in various ways, including Bobaljik's (2002) Minimize (LF:PF) Mismatch, Diesing's (1997) Scope Principle, and Bobaljik and Wurmbrand's (2012) Scope Transparency (ScoT). Bobaljik and Wurmbrand (2012) argue, in fact, that a language may vary from construction to construction in whether ScoT can be violated in service of other constraints. From this perspective, in the absence of mitigating factors the behavior of CPs is expected: they are interpreted where they are pronounced. In fact, we have seen corroborating evidence for this: the type-repairing movements that CPs undergo are overt (as is AspP-movement). Again, this fits the general and expected picture from the crosslinguistic perspective, which favors overt movement to resolve type clashes and prevents semantically vacuous movement.

CPs differ in this respect from English DPs, which can undergo semantically vacuous movement and QR. The proposal, which likens CPs to weakly quantified arguments, nudges us closer to an explanation. It also reframes the question. From Bobaljik and Wurmbrand's perspective, we would ask what construction-/category-specific factors can and cannot override ScoT. In fact, the burden of the explanation may be in understanding why DPs in English can undergo QR and move semantically vacuously, not why other categories like CPs can't.

Returning to CP proforms, they saturate in complement position. They are not trapped below EC; they are type *e* and in this respect move like a DP. (As a reviewer points out, more needs to be said about *so*, given its propensity to move like an operator in other contexts.) Sentential subjects and topics must rely on a DP strategy to move. Following Koster (1978), Alrenga (2005) recruits a null DP operator and base-generates the CP high (antireconstruction evidence for this analysis can be found in Moulton 2013). To deliver a proposition, a sentence-level ∃ is required.

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

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

Berman (1996) contends that sentential subjects and topics are clitic left-dislocated. If that's true, then evidence for this high existential quantification may come from existentially interpreted bare nominals that may undergo clitic left-dislocation in Italian; see footnote 26.

Here, then, is an analysis of *that*-clauses that reconciles their paradoxical behavior: they can combine with nouns that do not take arguments at all, but they can saturate verbs that do require their internal arguments. Instead of positing an ambiguity for *that*-clauses, I have shown how movement reconciles this behavior. At the same time, the analysis correctly rules out movement of bare *that*-clauses beyond AspP. The next section details a number of other benefits of the analysis.

5 Further Benefits

5.1 Extraction from CP

As discussed in section 3, facts about extraction and binding have often been used to argue against an extraposition analysis of CP complements. As shown by (58), CP complements are low for

the purposes of Condition C and variable binding. The present analysis accounts for these facts because it ensures that the CP merges in complement position. This is required so that the CP can move and leave a copy that saturates. This copy is subject to the binding principles.[28]

Extraction is possible from clausal complements, as shown in (56), which also precludes a rightward extraposition analysis. I likened the movement of *that*-clauses to HNPS. However, HNPS is opaque for extraction (Wexler and Culicover 1981).

(98) a. Who did you tell John that you had met ____?
b. ?*What did you give to John a book about ____?
(Lasnik and Saito 1992:103, (145))

So does the present analysis predict that clausal complements are likewise opaque, contrary to fact? No, because not all moved phrases are opaque to extraction. We have already seen that extraposed PPs are transparent for extraction ((67), (69a)). Abels (2008) argues that movement from moved constituents is constrained according to a hierarchy of the types of movement involved: for example, *wh*-movement cannot proceed from certain Ā-moved constituents, but it can from A-moved constituents (see also Müller 1996). This predicts that (the leftward DP-movement involved in) HNPS is Ā-movement while *that*-clause movement is A-movement. This prediction is confirmed by considerations of locality. HNPS can proceed from finite embedded clauses, indicative of Ā-movement.[29]

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

CP-extraposition is, however, famously clause-bound (Baltin 1978).

(100) a. *John was believed to be certain by everybody that the Mets would lose.
b. John was believed by everybody to be certain that the Mets would lose.

The clause-boundedness of *that*-clauses follows on the present account since movement beyond EC is ruled out. Nonetheless, as an A-moved term, the CP is transparent for *wh*-extraction.

5.2 The Position of That-*Clauses*

It should be made clear that factors other than compositionality can play a role in positioning CPs. The present proposal positions finite complements after AspP. This is not quite far enough to the right to capture all the attested surface positions of *dass*-clauses in German, for instance.

[28] Extraposed CP relatives bleed Condition C (Culicover and Rochemont 1990). One popular way of bleeding Condition C is countercyclic adjunction (Lebeaux 1991, Fox 2002). This cannot be invoked for *that*-clause complements because there is neither a determiner nor an NP to which the *that*-clause can late merge.

[29] These examples demonstrate another fact in support of HNPS being Ā-movement: parasitic gaps. But see Postal 1994.

They follow not just aspectual auxiliaries, but also modals (101) and infinitive-selecting matrix verbs (102). CPs cannot appear *within* the verbal complex formed by these elements.

(101) a. . . . weil er behaupten muss [$_{CP}$ dass er Hemingway geschlagen hat].
. . . because he claim must that he Hemingway beaten has
‘. . . because he must claim that he has beaten Hemingway.’
b. . . . weil er *[$_{CP}$ . . .] behaupten *[$_{CP}$ . . .] muss.

(102) a. . . . weil er behaupten können wollte [$_{CP}$ dass er Hemingway geschlagen hat].
. . . because he claim be.able want that he Hemingway beaten 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))

At first, this would appear to pose a problem for the proposal. However, there is good reason to think that restrictions against the CP appearing within the verbal complex are due to independent constraints on the formation of the verbal complex itself. We can see this because the CP does not have to move above modals when other factors relieve it from interrupting the verbal cluster. This happens, for instance, when a constituent containing AspP and the CP undergo topicalization (Büring and Hartmann 1997).

(103) [Sagen dass Schnaps gut schmeckt] muss er nicht.
say that schnapps tastes good must he not
‘Say that schnapps tastes good, he must not.’

This indicates that CPs need not in principle move higher than aspect (Büring and Hartmann 1997). A ‘‘hybrid’’ solution is required to rule out (101b) and (102b): successful semantic composition forces the CP to occupy a position just following Asp. If the contents of T do not undergo verb-second (or a larger phrase does not move the CP away, as in (103)), leaving the CP within the verbal cluster renders the cluster ill-formed. According to some research, the verbal cluster forms a morphological or prosodic unit, one that cannot be interrupted by a phonological phrase like a CP (Truckenbrodt 1995, Van Riemsdijk 1998, Wurmbrand and Bobaljik 2005; but cf. Koopman and Szabolcsi 2000 for a syntactic view). I suggest that a PF rule positions the CPs to the right of the verbal complex (Truckenbrodt 1995, Wurmbrand and Bobaljik 2005). I must stress that PF movement is not alone sufficient to account for the position of CPs in German. (Otherwise, nothing would explain why the CP does not stay to the left of the verb to avoid interrupting the verb cluster.) The first step—the semantically motivated movement I have argued for—squeezes *that*-clauses between Asp and other elements in the verbal complex, which may trigger further movement.

Turning to the positions that CPs take more generally, the prediction is this: CPs that *do* saturate predicates should not trigger this complex series of movements. In this respect, those German infinitives with ‘‘nominal’’ distribution (preverbal, restructuring infinitives) are predicted to be true arguments. In more uniformly head-final languages, such as Japanese and Korean,

complement CPs occupy preverbal position. Why don't they trigger the kinds of movements Indo-European CPs do? First, many of the CPs that appear preverbally in OV languages like Korean and Japanese are nominal (Hiraiwa 2010), and so their DP distribution is unexceptional. More interesting are those preverbal CPs that do not have nominal characteristics, such as Korean CPs headed by the complementizer *ko* (104a). The present account entails that this (nonnominal) clause can occupy a typical preverbal complement position precisely because it is a saturating CP. This makes the prediction that unlike familiar Indo-European CPs, *ko*-clauses will not be able to combine with non-argument-taking nouns. This prediction is borne out: *ko*-clauses cannot combine with content nouns (104b).

(104) a. Mina-ka [Swuna-ka ku mwuncey-lul phwul-ess-ta]-**ko**
Mina-NOM Swuna-NOM that problem-ACC solve-PAST-DECL-C
cwucangha-yess-ta.
claim-PAST-DECL
'Mina claimed that Swuna solved the problem.'

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

Ko-clauses are in-situ saturators. Relatedly, English exceptional case-marking (ECM) complements appear to be in-situ saturating clausal arguments, too. This is confirmed by their inability, in which they contrast with *that*-clauses, to combine with NASNs (Kayne 1984).

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

Korean *ko*-clauses, although finite, are like ECM complements in being transparent for A-movement, as exhibited by the following raising-to-object construction:

(106) John-un Mary-lul mitep-ta-**ko** sangkakha-n-ta.
John-NOM Mary-ACC reliable-DECL-C think-PRES-DECL
'John thinks Mary to be reliable.'
(Hong and Lasnik 2010:281, (40))

I speculate that what regulates raising is the semantic status of the complement clause: raising is possible from CPs that saturate in situ. This just happens to correlate with tense in most Indo-European languages. This offers a fresh perspective on raising-to-object/ECM, one that is dependent neither on case nor on tense.

6 Conclusion

This article has offered a general theory of CPs and their distribution. It did so by giving a principled explanation for the contrasts between *that*-clauses and CP proforms. Those contrasts made it clear that the ability of *that*-clauses to combine with nouns (unlike CP proforms) must

be connected to their inability to move (again, unlike CP proforms). The analysis made that connection. Treating *that*-clauses as type ⟨e,st⟩ lets them combine with non-argument-taking nouns. In the verbal domain, however, this triggers an (independently motivated) syntax-semantics that prevents bare *that*-clauses from moving very far.[30]

CPs have taught us something about movement and the copies it produces. Lower copies may manufacture individuals from predicates. Moreover, this characterization of copies does not rely on determiners to perform this type shift, as do the proposals in Fox 2002, Takahashi 2010, and Johnson 2012. This is exactly what CPs tell us: lower copies denote restricted variables, even if they are not DPs.

Finally, it is worth remembering what Emonds (1972) taught with his arguments against Rosenbaum's (1967) NP-over-S analysis of argument clauses: sentential arguments distribute differently from nouns. This lesson sometimes gets lost when ideas about DP-CP parallelism are suggested (see also Bruening 2009). The roles of D and C are quite different: C, unlike D, does not ''turn'' something into an argument. In fact, the complementizer proposed here frustrates the predicate-argument relation, triggering movements that give Indo-European finite CPs their typical peripheral distribution. Why would a language exhibit such a complicating imperfection? Perhaps it is vestigial, a remnant of older Indo-European syntax when argument clauses were adjoined (Kiparsky 1995). It seems that *that*-clauses have retained, at least in semantic type, their nonargument status, but now movement resolves the composition problem, rather than the older strategy in which the CP is base-adjoined high and a correlative proform occupies the argument position (a strategy still available).[31] This contrasts with other language families in which finite argument clauses are either nominalized or introduced by grammaticalized verbs of saying (Bayer 1999). It is not surprising where the crosslinguistic variation resides: what one language does with the morphosyntax, another does with movement.

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[30] Question complements remain to be elucidated from this perspective, but there are obvious connections between the present account and indirect dependency approaches to *wh*-scope marking (Dayal 1996).

[31] Binding-theoretic diagnostics (58) supply the crucial data for a low source for the CP in the synchronic grammar. We might be uneasy about how much rides on Condition C, given the results about variable binding into CPs in Moulton 2013.

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