

CP complements to D*

Jorge Hankamer (UC Santa Cruz) and Line Mikkelsen (UC Berkeley)

November 6, 2012

Abstract

Danish has two nominal constructions containing a CP complement, one with a preposition preceding the CP and one without, and an interesting interaction between the presence vs. absence of the preposition and definiteness marking. We argue that there are two different structures, and in particular that the prepositionless construction is a bivalent structure in which the CP is a complement of D. We extend this analysis to several bivalent structures in English, and finally suggest that English also has two structures for DPs containing CP complements.

1 Introduction

In this paper we investigate clausal complements inside Danish nominal phrases and their interaction with definiteness marking. The construction of interest involves an abstract head noun followed by a CP, as in the English example in (1):

- (1) the idea [_{CP}that ginger aids digestion]

We refer to this as a DP with a Clausal Complement, or a DCC for short. Grimshaw (1990:94–101) argues that despite appearances the CP is not a complement to N in (1), and we will argue that the same is true in Danish, though the empirical situation is both more complicated and more revealing.

The first complication is that there are two realizations of DCCs in Danish. What we call the Bare DCC in (2) looks just like the English construction above: N is followed directly by a CP. In the Prepositional DCC, a preposition intervenes between the N and the CP, as shown in (3).

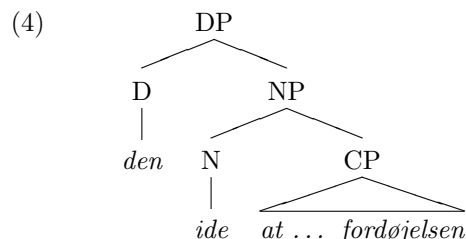
- (2) den ide at ingefær gavner fordøjelsen [D N CP] = Bare DCC
the idea that ginger aids digestion.DEF
the idea that ginger aids digestion
- (3) en ide **om** at ingefær gavner fordøjelsen [D N P CP] = Prepositional DCC
a ide about that ginger aids digestion.DEF
an idea that ginger aids digestion

*This paper began life as a presentation at the 2009 LSA meeting in San Francisco and we thank that audience and audiences at UC Santa Cruz and UC Berkeley for feedback. The link to English comparative constructions was first suggested to us by Judith Aissen and we gratefully acknowledge her role in moving us towards the present analysis.

A second complication is the interaction of the two kinds of DCC with Definiteness marking: the Bare DCC uses the prenominal article, whereas the Prepositional DCC uses the definite suffix.¹

While perhaps puzzling from an English perspective, the existence and behavior of the Prepositional DCC is in fact entirely expected from the point of view of Danish syntax, as we show in section 2.4. It is the Bare DCC in (2) that is the real challenge and the main objective of this paper is to develop an analysis of the Bare DCC that is compatible with the other aspects of Danish syntax and explains its characteristic properties. An important assumption that will guide our search for an appropriate analysis will be that if a phrase is selected for by a head, then that phrase is an argument of the head, i.e. a specifier or complement.

A traditional analysis of (2) is that the CP is a complement to N, as in (4).



This structure accounts for the independent realization of definiteness marking, if we assume, with Hankamer and Mikkelsen (2005), that definite D is realized as a suffix if and only if definite D is sister to a minimal, i.e. non-branching, NP. The NP sister of D in (4) is not minimal, but branches into N and CP. Hence the insertion context for the definite suffix is not met and the definite D is realized as a prenominal article, the elsewhere case. The major problem with the structure in (4) is that it suggests that bare CP complements should be possible with any D, since there is no structural dependency between D and CP, and that is not the case: only the definite article allows a bare CP complement (section 2).

We propose that the key to this puzzle is that in the Bare DCC CP is a complement to D. On the model of the VP-shell analysis of ditransitive verbs (Larson 1988, 1991), D raises to a higher functional head, which we call d:

¹We have found very little discussion of DCCs in the otherwise extensive literature on Scandinavian DP structure, though Hansen and Heltoft (2011:1509–1512) provide a brief description of the Danish constructions. Their characterization of the data is in accord with ours, with two exceptions. First, Hansen and Heltoft characterize the use of the prepositional DCC with the suffixed definite article as a strong tendency, where we consider it a grammatical requirement. Second, Hansen and Heltoft assume that some bare DCCs of the form in (2) involve the demonstrative determiner *den*, and not the definite article *den*, whereas we believe that *den* in the bare DCC is uniformly the definite article. We are not in a position to settle the matter empirically here, but our general approach is compatible with either outcome, since, under our analysis of the DCC, participation in the DCC is determined by selection on the part of individual determiners. Only determiners that select for a CP occur in the bare DCC. Our current position is that the definite article is alone in selecting for a CP, but should it turn out that the demonstrative determiner occurs in the DCC as well, our analysis could be modified to allow for that simply by changing the lexical specification of the demonstrative determiner.



This analysis allows definite D to subcategorize for CP, correctly restricting the Bare DCC to the definite article, and it prevents insertion of the definite suffix, since D^0 is not a sister to NP, and thereby accounts for the use of the prenominal article in (2). We further analyze NP as a specifier of D and derive the word order D NP CP by head raising of D to a higher functional head. We will thus be referring to this analysis as the head raising analysis of the Bare DCC.

In section 2, we describe the two constructions in more detail and provide an analysis of the Prepositional DCC, building directly on Hankamer and Mikkelsen (2005, 2008). Section 3 presents the head raising analysis of the Bare DCC and shows how it accounts for the properties of this construction. In section 4, we show that the head raising analysis can be successfully employed for a family of recalcitrant English constructions, including comparatives, *too*-constructions, *so*-constructions, and a few more. In section 5 we turn to English DCCs like (1) above and suggest that there are also two structures for these in English, though they are not as easily discerned as in Danish. Section 6 concludes the paper

2 DPs with Clausal Complements

As introduced above, Danish has two distinct DCC constructions.

- (6) den ide at ingefær gavner fordøjelsen [D N CP] = Bare DCC
 the idea that ginger aids digestion.DEF
 the idea that ginger aids digestion
- (7) en ide **om** at ingefær gavner fordøjelsen [D N P CP] = Prepositional DCC
 a ide about that ginger aids digestion.DEF
 an idea that ginger aids digestion

The two are not in free variation. The bare DCC is only possible with the definite article; indefinite, possessive, and demonstrative determiners require the prepositional DCC, as (8) shows.²

²Strings like those in (8) do occur, as shown in the grammatical examples below.

- i. Det var [DP hans ide] [CP at vi skulle putte ingefær i suppen].
 it was his idea that we should put ginger in soup.DEF
 It was his idea that we should put ginger in the soup.
- ii. Det er [DP en kendsgerning] [CP at ingefær gavner fordøjelsen].
 it is a fact that ginger aids digestion
 It is a fact that ginger aids digestion.

But here the CP does not form a constituent with the preceding DP. Rather these are extraposition structures, just like their English counterparts, and do not involve DCCs. Consequently, the grammaticality of (i) and (ii) does not bear on our claim that Bare DCCs only allow the definite article.

- (8) en/hans/denne ide *(om) at ingefær gavner fordøjelsen
a/his/this idea about that ginger aids digestion.DEF

Moreover, a definite DCC can have a prepositional realization, but then definiteness must be realized as a suffix on N, as in (9), and not a prenominal article (10).³

- (9) ide-en om at ingefær gavner fordøjelsen
idea-DEF about that ginger aids digestion.DEF
the idea that ginger aids digestion
- (10) *den ide om at ingefær gavner fordøjelsen
DEF idea about that ginger aids digestion

Finally, suffixal definiteness is incompatible with a bare DCC:

- (11) *ide-en at ingefær gavner fordøjelsen
idea-DEF that ginger aids digestion.DEF

These facts can be summarized as follows: in general Danish DCCs require a preposition between N and CP, but just in case the DCC is headed by a prenominal definite article, a bare realization is possible and in fact required.

2.1 On the meaning and use of DCCs

In addition to the morphosyntactic differences established above, the definite versions of the two DCC constructions contrast in meaning and use. Like prototypical definite DPs, a definite Prepositional DCC presupposes the existence of a referent for the DP, as can be shown for (12).

- (12) De har overholdt [aftalen om at bibliotekerne skal finansieres via brugerbetaling].
they have kept agreement.DEF about that libraries.DEF shall finance.PASS via user.payment
They have kept the agreement that libraries must be financed by the users.

To evaluate the truth of (12) an agreement that library users pay to use the library must have been made. If (12) is negated, as in (13), this is still the case, showing that this is a presupposition, as opposed to an entailment. If no such agreement has been made, (12) and (13) cannot be assigned a truth value.

- (13) De har ikke overholdt aftalen om at bibliotekerne skal finansieres via brugerbetaling.
they have not kept agreement.DEF about that libraries.DEF shall finance.PASS via user.payment
They have not kept the agreement that libraries must be financed by the users.

In contrast a definite Bare DDC like (15) does not presuppose the existence of a referent; it asserts it.

- (14) De har lavet den aftale at bibliotekerne skal finansieres via brugerbetaling.
they have made DEF agreement that libraries.DEF shall finance.PASS via user.payment
They have made the agreement that libraries must be financed via user payment.

³(10) is grammatical if *den* is stressed, but then *den* is unambiguously a demonstrative D, not a definite article.

If there is no agreement about library user payment, (14) is false, not truth-valueless or uninterpretable. The negation of (14), given in (15), does not presuppose any such agreement either, in fact it denies it.

- (15) De har ikke lavet den aftale at bibliotekerne skal finansieres via brugerbetaling.
 they have not made DEF agreement that libraries.DEF shall finance.PASS via user.payment
They have not made the agreement that libraries must be financed via user payment.

This difference between Prepositional and Bare definite DCCs is reflected in their distribution. A search for Prepositional and Bare definite DCCs with the noun *aftale* ‘agreement’ in Korpus DK revealed the distribution in (16).⁴

- (16) Distribution of definite DCCs with the noun *aftale* in Korpus DK
- a. Prepositional definite DCC occurs as
 - i. object of predicates like *overholde* (keep), *være uenig i* (disagree with), *opsige* (cancel), *undertegne* (sign), *være med i* (be part of); and
 - ii. subject of predicates like *være kommet i stand* (be established), *holde* (last), *få tilslutning* (get support), *blive effectueret* (be implemented), *blive aflyst* (be cancelled), *blive betegnet som* (be characterized as), *være præget af* (be characterized by), *være uantagelig* (be unacceptable).
 - b. Bare definite DCC occurs as
 - i. object of predicates like *have* (have), *lave* (make), *få* (get, reach), *indgå* (enter into), *skilles med* (separate with), *give håndslag på* (shake hands on)
 - ii. only one attested subject use, with the verb *indgå* (be included in)

The predicates in (16ai) support a presuppositional semantics for the Prepositional DCC: one can only cancel, keep or disagree with an agreement if that agreement already exists. Similarly for the predicates in (16aii): only existing agreements can only be cancelled, supported or deemed unacceptable. In contrast, several of the predicates in (16bi) are at odds with a presuppositional semantics: one cannot make or reach an agreement that already exists. Similarly, if an agreement is confirmed by shaking hands, as is traditionally the case in Danish transactions, then the agreement does not exist prior to the handshake.

We propose that the meaning difference between Prepositional and Bare DCCs falls under Hawkins’ (1978: 130–149) distinction between anaphoric and referent-establishing definites, specifically that the Prepositional DCC is anaphoric whereas the Bare DCC is referent establishing.

Hawkins notes (p. 140) that certain definite nominal phrases containing CP complements can be referent-establishing, in the sense that no prior reference is required, though without the CP the nominal would be illicit without a prior reference being established: an example is *Bill is amazed by the fact that there is so much life on earth*. As shown for Danish above, anaphoric interpretation of a definite DCC is associated with standard DP syntax: D takes NP complement. Referent-establishing interpretation is associated with special DP syntax: D takes CP complement and NP specifier.

⁴Korpus DK is the main corpus of contemporary Danish. It contains 56 million words from a variety of genres and is publicly accessible at <http://ordnet.dk/korpusdk>.

2.2 Restrictions on N

The two DCCs also differ in which Ns they allow. In particular, the Bare DCC admit a larger set of Ns than the Prepositional structure. Both the Bare and Prepositional DCC allow the Ns in 1–24:

1.	aftale	‘agreement’	ambition	‘ambition’	anmodning	‘request’
2.	antagelse	‘assumption’	antydning	‘hint’	argument	‘argument’
3.	bekræftelse	‘confirmation’	bekymring	‘worry’	betingelse	‘condition’
4.	debat	‘debate’	diskussion	‘discussion’	drøm	‘dream’
5.	erklæring	‘declaration’	fantasi	‘fantasy’	forestilling	‘notion/idea’
6.	forhåbning	‘hope’	forklaring	‘explanation’	formål	‘purpose’
7.	formodning	‘supposition’	forsikring	‘assurance’	forslag	‘proposal’
8.	forudsigelse	‘prediction’	forventning	‘expectation’	frygt	‘fear’
9.	garanti	‘guarantee’	håb	‘hope’	henstilling	‘request’
10.	historie	‘story’	hypotese	‘hypothesis’	ide	‘idea’
11.	indrømmelse	‘confession’	indvending	‘objection’	initiativ	‘initiative’
12.	klage	‘complaint’	kompromis	‘compromise’	krav	‘demand’
13.	lov	‘law’	løfte	‘promise’	løgn	‘lie’
14.	lyst	‘desire’	mål	‘goal’	målsætning	‘objective’
15.	mareridt	‘nightmare’	mistanke	‘suspicion’	mulighed	‘possibility’
16.	opfattelse	‘perception’	opfordring	‘invitation’	overbevisning	‘conviction’
17.	påbud	‘order’	påmindelse	‘reminder’	påskud	‘pretext’
18.	påstand	‘claim’	plan	‘plan’	regel	‘rule’
19.	risiko	‘risk’	rygte	‘rumor’	spekulation	‘speculation’
20.	spørgsmål	‘question’	standpunkt(?)	‘position’	strategi	‘strategy’
21.	tanke	‘thought’	tese	‘hypothesis’	tilbud	‘offer’
22.	tilskyndelse	‘impulse’	tro	‘belief’	trussel	‘threat’
23.	undskyldning	‘excuse’	vink	‘hint’	vished	‘certainty’
24.	ønske	‘wish’				

The Bare DCC additionally allow the Ns in 25–35, which are not allowed in the Prepositional DCC.

25.	afvisning	‘rejection’	beføjelse	‘authority/right’	erstatning	‘compensation’
26.	evne	‘ability’	fejl	‘error’	fejltagelse	‘error’
27.	forbløffelse	‘amazement’	fordel	‘advantage’	forhold	‘condition’
28.	gåde	‘riddle’	genistreg	‘stroke of genius’	hobby	‘hobby’
29.	indsigt	‘insight’	indskydelse	‘impulse’	inspiration	‘inspiration’
30.	interesse	‘hobby’	kendsgerning	‘fact’	konsekvens	‘consequence’
31.	nederlag	‘defeat’	nødvendighed	‘necessity’	pris	‘cost’
32.	sag	‘case/fact’	sejr	‘victory’	sensation	‘sensation’
33.	skandale	‘scandal’	synspunkt	‘point of view’	triumf	‘triumph’
34.	ulempe	‘disadvantage’	ulykke	‘bad luck’	valgmulighed	‘option’
35.	virkning	‘effect’				

We are not in a position to offer a precise semantic characterization of these two groups of Ns, but the important point for the present purposes is that there is a difference in the range of Ns that

occur in the two DCC constructions, since we will propose radically different structures for these.

This concludes our examination of the two DCC constructions. Before we present our analysis of each of them, we need to lay out the basic facts about definiteness marking in Danish.

2.3 Danish definiteness markers

Danish has two ways of marking definiteness: a suffix on the head noun and a prenominal article. The two are in complementary distribution and both show gender (neuter vs. common) and number (singular vs. plural) distinctions. Here we use the singular common gender forms *-en* and *den* for illustration, but the pattern is the same with neuters and plurals.

First, unmodified DPs require the definite suffix:

- (17) film-en
film-DEF
the film

- (18) *den film
DEF film

In contrast, DPs with a prenominal adjective require the definite article:

- (19) *nye film-en
new film-DEF

- (20) den nye film
DEF new film
the new film

Postnominal PPs license the definite suffix (21), but occur with the definite article if the article is required by another element, such as a prenominal adjective (22).

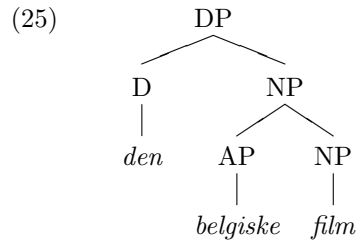
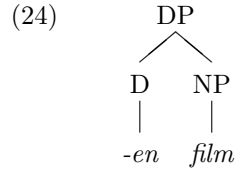
- (21) a. film-en fra Belgien
film-DEF from Belgium
b. *den film fra Belgien
DEF film from Belgium

- (22) a. *nye film-en fra Belgien
new film-DEF from Belgium
b. den nye film fra Belgien
the new film from Belgium

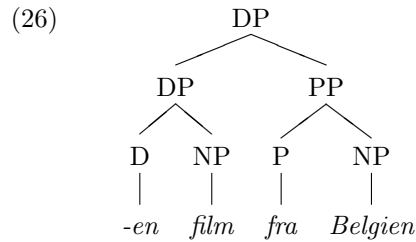
Hankamer and Mikkelsen (2005, 2008) analyse this pattern as in (23):

- (23) a. *-en* is found when D[DEF] is sister of a minimal NP (i.e. NP consisting solely of N)
b. *den* is found elsewhere

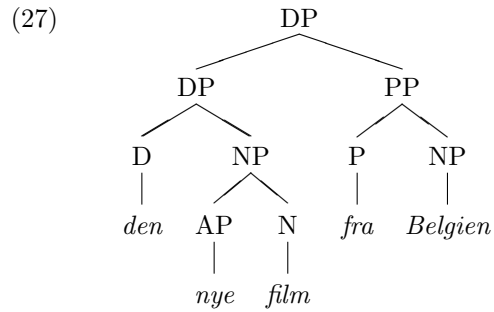
In unmodified DPs, D[DEF] is a sister to a minimal NP, so the definite suffix is used (24). In DPs with adjectival modification, the NP sister of D[DEF] is not minimal – it contains an AP – and thus the definite article is used (25).



As illustrated in (26), we assume that PPs adjoin to DP (Hankamer and Mikkelsen 2005:111-113, 118; 2008: 326-327, Julien 2005:67-69). This leaves NP as a minimal sister to D[DEF], resulting in D[DEF] being spelled out as the definite article in (21):



If an AP is added, as in (22) the NP is no longer minimal and the definite article must be used:



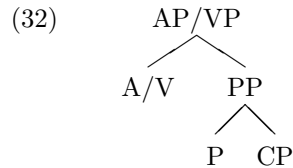
In the next section we extend this line of analysis to the prepositional DCC.

2.4 The structure of Prepositional DCCs

Whereas the complement of English prepositions is largely restricted to DPs, Danish prepositions may take either CP or DP complements. The examples below show this for the prepositions *af* (of), *med* (with), *på* (on) and *om* (about).

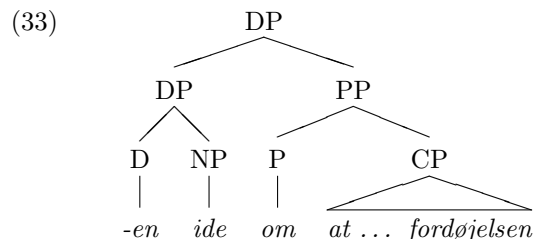
- (28) a. Alle er kede [PP **af** [CP at hun er blevet fyret]].
 everyone is sorry of that she is become fired
Everyone is sorry that she was fired.
- b. Alle er kede [PP **af** [DP den her situation]].
 everyone is sorry of this here situation
Everyone is sorry about this situation.
- (29) a. Vi regner [PP **med** [CP at de kommer i næste uge]].
 we count with that they come in next week
We expect that they are coming next week.
- b. Vi regner [PP **med** [DP mange flere deltagere i år]].
 we count with many more participants in year
We expect many more people next year.
- (30) a. Jeg tror [PP **på** [CP at mine sange opbygger modet i folk]].
 I believe on that my songs up-build courage-DEF in people
I believe that my songs build courage in people.
- b. Jeg tror [PP **på** [DP ham]].
 I believe on him
I believe in him./I believe him.
- (31) a. De er enige [PP **om** [CP at han skal flytte]].
 they are in.agreement about that he must move
They all agree that he needs to move.
- b. De er enige [PP **om** [DP finansieringen.]].
 they are in.agreement about financing.DEF
They agree on the financing.

The a.-examples above all involve the schmatic structure in (32), where the predicate (A or V) takes a PP complement, whose head in turn takes CP complement.



Putting this together with the assumption from the previous section that PPs adjoin to DP in nominal structures, we arrive at the structure in (33) for Prepositional DCCs.⁵

⁵Most nouns occur with the preposition *om* in the prepositional DCC, but a small set of nouns select for different prepositions, as in *risiko for at* ‘risk for that’, *tro på at* ‘belief in that’, *initiativ til at* ‘initiative to that’.



This structure places no special restrictions on D, which meshes with the observation that not just definite D, but also indefinite, possessive and demonstrative Ds are possible in the Prepositional DCC (see (8)). Furthermore, D is a sister to a minimal N, and thus realized as a suffix on N when definite.

This concludes our analysis of the Prepositional DCC and we turn now to the more mysterious Bare DCC.

3 The structure of the Bare DCC

An example of the Bare DCC construction is repeated in (34):

- (34)
- | | | | | | |
|------------|-------------|-------------|---------------|-------------|------------------|
| den | ide | at | ingefær | gavner | fordøjelsen |
| the | idea | that | ginger | aids | digestion.DEF |
| <i>the</i> | <i>idea</i> | <i>that</i> | <i>ginger</i> | <i>aids</i> | <i>digestion</i> |

In this construction there are three pieces (D, NP, and CP) and three things that need to be accounted for:

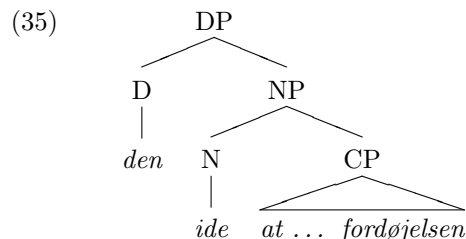
- a. the order is D NP CP
- b. definiteness is realized as an independent article, not as a suffix
- c. there is selection between D and CP and between D and NP⁶

In section 3.1 we consider some obvious candidate structures for (34) and show that they won't work; in particular they all have trouble accounting for the selection between D and CP. In section 3.2 we lay out the head raising analysis and in section 3.3, we show how this analysis accounts for the characteristic properties of the Bare DCC, including selection of CP by D and prenominal definiteness marking.

3.1 Some analyses that don't work

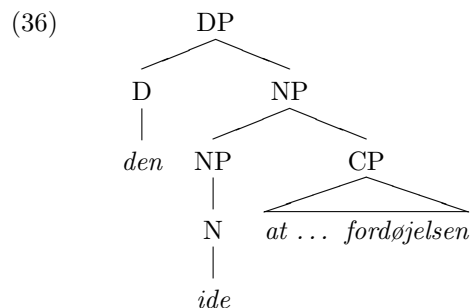
Perhaps the most obvious analysis to consider is one where the CP is a complement to N, as in (35).

⁶D selects NP, of course, in the straightforward old-fashioned sense that a head determines the possible categories of its arguments.



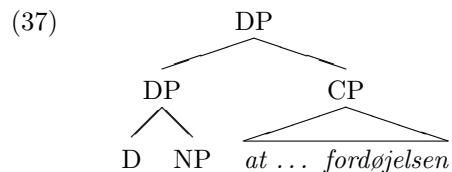
This will get the pieces in the right order (a), and will make the right predictions about definiteness marking (b), but would leave the selection of CP by D[DEF] (c) mysterious.⁷

For similar reasons, an analysis in which the CP is adjoined to NP can be rejected:



Again, while the order is derived straightforwardly, and the expected definiteness marking would be the prenominal article, as observed, again it would be mysterious that the D[DEF] selects the CP.

Obviously, any analysis that involves first combining D and NP to form a DP, which then combines (perhaps by apposition) with the CP, as in



will fail to get the definiteness marking right, in addition to leaving it mysterious how the D[DEF] can select CP.⁸

⁷The situation here is crucially different from that in the case of Ns selecting PP arguments, as in section 2.4. There the N, in conformance to Grimshaw's extended projection hypothesis, selects an argument that is adjoined within its extended projection. No intervening head interferes with this selection, because all the intervening heads are in the extended projection of N. In (35), D cannot select CP precisely because the intervening N selects CP. The selection by a functional head of its complement (in older terms, strict subcategorization, or l-selection) is locally constrained in a way that selection by a lexical head of its arguments (in older terms, s-selection) is not.

⁸Yet another approach would be to propose a ternary-branching structure, in which D takes an NP complement and a CP complement. This would get the word order (by stipulation or by a presumed heaviness-to-the-right preference). It would allow D to select both NP and CP. But it would not account for the nature of the definiteness marking.

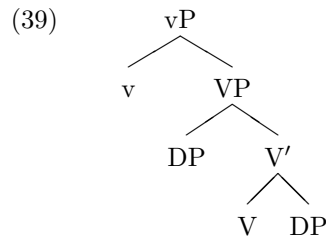
3.2 A head raising analysis

In the nearly workable analyses that we have rejected, the difficulty is the double selection: the D[DEF] clearly selects the CP, since no other D permits a CP; at the same time there is selection of the NP, since there are Ns which can occur in the Bare DCC construction but cannot occur in the Prepositional DCC (see section 2.2).⁹

Another place where such a problem appears is in the case of ditransitive verbs (Larson, 1988):

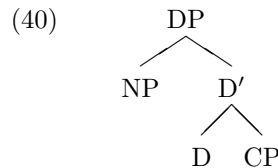
(38) I showed Harvey the photos.

Note that here too there is apparent double selection by a head (the ditransitive V) with both selected elements following the head, as if it had two complements. A commonly accepted solution is to posit a little v shell containing the VP structure, in which one of the DP arguments is a complement to V and the other a specifier:



The order V-DP-DP is then derived by an assumed Head-Raising of V to v.

Taking inspiration from this, and from later unpublished work by Larson (Larson, 1991), we suggest a parallel analysis for Bare DCCs, with an underlying structure in which D[DEF] takes a CP complement directly and an NP specifier:



In such a structure it is not at all mysterious why D[DEF] can select for a CP complement, and also have selection effects on its NP specifier. It is also not surprising that the selection differs in nature. The selection of the CP is strict subcategorization: all that matters is that there be a CP and that its C be of the appropriate type. The selection of the NP is semantic selection: only certain Ns work as heads of these NPs because there is a semantic constraint imposed upon the NP.

This structure is then assumed to be a complement to a functional head (call it d), to which D raises by Head Movement:¹⁰

⁹Of course it can't be the D alone that is selecting the N, but the combination of D and CP.

¹⁰Given the structure proposed, one might ask whether we can find arguments supporting the proposed c-command relations, like those in Barrs and Lasnik (1986), which support the V-shell structure. Unfortunately, we cannot at present. The Barss-Lasnik diagnostics all involved relations between DPs, and we don't have a similarly broad variety of diagnostics for relations between NPs.



3.3 How this accounts for everything

First, the order D NP CP is accounted for (a bit less straightforwardly than in the rejected analyses (CP complement of N, CP adjunct to NP)) by the raising of D to a higher head position, where it ends up to the left of its specifier as well as its complement.

The realization of D[DEF] as the prenominal article is predicted under this analysis because the D and N are never in direct construction with each other (D is never a sister of a minimal N).

Thirdly, the selection relations are accounted for. D[DEF] can select a CP complement (unlike any other D) and can also exert selection over its specifier, via head-specifier selection.

In connection with this last part, we also have an extra bit of support for the assumption that CP merges first, and then NP. The selection of CP is different from the selection of NP in two significant ways. The selection of CP by D[DEF] is an instance of strict subcategorization: of all Ds, only D[DEF] can select a bare CP in construction with it at all. The selection of the head NP is, on the other hand, not a property of the D[DEF] alone (any D can occur with all those Ns); it is the combination of D[DEF] + CP that sanctions the set of Ns that can appear in this construction (the Bare DCC), but not in the Prepositional DCC construction (see list in 25–35 in section 2.2). This situation is precisely a case of asymmetric predicate-argument structures Marantz (1984:27), where the selection of the specifier is a property not of the head alone, but of the head + complement combination.

Note that this gives us a principled account of the word order that the ternary-branching structure mentioned in footnote 8 lacks. These considerations in fact count as an argument against any analysis that involves combining D+NP first.

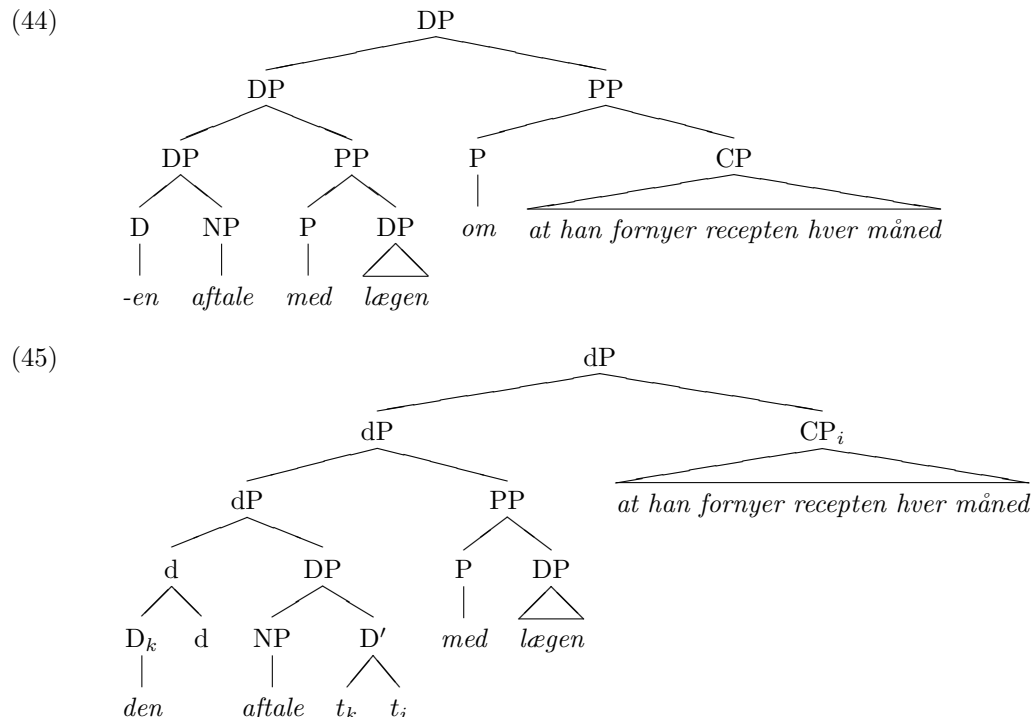
The underlying structure we propose for the Bare DCC is substantially different from the one we propose for Prepositional DCCs: instead of NP being a complement to D, NP is a specifier to D, and instead of the (P-encased) CP adjoining to DP, the CP is the complement of D. However, head-raising of D to above NP and the availability of rightward extraposition of CP to adjoin to DP minimize the surface effects of these underlying structural differences. For instance, if the DCC contains a (second) PP, that PP precedes the clausal complement in both structures:

- (42) aftal-en [med lægen] om at han fornyer recepten hver måned
 agreement-DEF with doctor.DEF about that he renews prescription.DEF each month
 ‘the agreement with the doctor that he refills the prescription each month’

- (43) den aftale [med lægen] at han fornyer recepten hver måned
 DEF agreement with doctor.DEF that he renews prescription.DEF each month
 ‘the agreement with the doctor that he refills the prescription each month’

This ordering reflects a general preference for CP dependents to follow PP dependents, in Danish and in many other languages. We don’t know the ultimate source of this preference, but the two

DCC structures we propose both allow for it, as long as we assume that CPs encased in a PP count as CPs with respect to this ordering principle. In (42) the observed order reflects order of adjunction: [PP P DP] adjoins before [PP P CP] as in (44). In (43) the PP-before-CP order comes about through extraposition of the CP complement of D across the PP, as in (45). (We assume that adjunction and extraposition both target the highest nominal projection, which is DP in (44) and dP in (45).



Crucially, the definiteness marking is not affected by the presence of the second PP: the Bare DCC still receives prenominal definiteness marking and the Prepositional DCC suffixal definiteness marking. Under our analysis this is because the PP adjoins to DP and as such does not affect the configuration of D and NP, which is what determines definiteness marking. Thus in the Prepositional DCC, D is the sister of a minimal N, whether or not a second PP is adjoined to DP, and thus the condition for suffixal definiteness marking is met. In the Bare DCC, that condition is not met – D is a sister to CP – and adjunction of a PP to DP, of course, does not change this fact, and consequently the definite D is realized as a prenominal article, the elsewhere case.

The signature semantic difference between the two types of DCCs—Prepositional DCCs are anaphoric, Bare DCCs are referent establishing—is also unaffected by the addition of the PP. Thus (42) fits naturally in a sentential context like (46), where the DCC is a factive verb, whereas (43) is felicitous with a verb of creation, as in (47). (See section 2.2 for discussion of this semantic difference.)

- (46) Vi er glade for aftal-en med lægen om at han fornyer recepten hver
 we are glad for agreement-DEF with doctor.DEF about that he renews prescription.DEF each

måned.
month
'We are pleased with the agreement with the doctor that he refills the prescription each month.'

- (47) Vi lavede den aftale med lægen at han fornyer recepten hver måned.
we made DEF agreement with doctor.DEF that he renews prescription.DEF each month
'We made the agreement with the doctor that he refills the prescription each month.'

If the two DCCs are switched, as in (48) and (49) below, the resulting sentences are infelicitous:¹¹

- (48) #Vi er glade for den aftale med lægen at han fornyer recepten hver måned.
we are glad for DEF agreement with doctor.DEF that he renews prescription.DEF each month
- (49) #Vi lavede aftal-en med lægen om at han fornyer recepten hver måned.
we made agreement-DEF with doctor.DEF about that he renews prescription.DEF each month

The infelicity of (48) and (49) shows that the hypothesized link between syntax and semantics in the realm of DCCs is a stable one which persists in the context of additional DP material, such as a postnominal PP. We take this as evidence that an analysis where the difference between the two DCCs is built into their core underlying configuration, as we have proposed to do, is on the right track.

In general the addition of an attributive adjective to a definite DP triggers prenominal definiteness marking, since the AP adjoins to NP making it impossible for the definite D to be a sister to a minimal N as required for suffixal definiteness marking. We thus expect a shift to prenominal definiteness marking in the Prepositional DCC if an attributive adjective is included. This is correct as shown in (50), where the adjective *faste* 'regular' is added to the Prepositional DCC in (42). As (50a) shows, suffixal definiteness marking is now impossible; instead definiteness is marked by the prenominal article, as in (50b).

- (50) a. **faste* aftal-en med lægen om at han fornyer recepten hver måned
regular agreement-DEF with doctor.DEF about that he renews prescription each month
- b. den *faste* aftale med lægen om at han fornyer recepten hver måned
DEF regular agreement with doctor.DEF about that he renews prescription each
'the regular agreement that he renews the prescription'

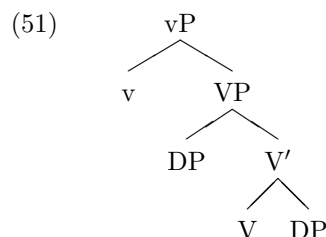
As expected, this effect on definiteness marking holds whether or not the PP *med lægen* 'with the doctor' is present and it does not affect the anaphoric semantics associated with the Prepositional DCC. This latter observation is important in that it demonstrates that it is not the choice of definiteness marking (suffixal vs. prenominal) that conditions anaphoric vs. reference-establishing interpretation. If it were, (50b) should be referent-establishing contrary to fact. Rather, the semantic difference is linked to the underlying configuration of NP and CP relative to the definite D. In some circumstances (e.g. if no attributive adjectives are present), that underlying difference results in different realizations of definiteness marking, but it need not, as (50b) shows.

¹¹(49) can be rescued by focus accent on the subject *vi* 'we'. Subject focus makes the maker of the agreement the new information in the sentence, allowing for an anaphoric reading of the Prepositional DCC: the agreement is part of the common ground, it's the identity of one of the parties of the agreement that is being established, not the existence of the agreement itself.

4 Other head-initial bivalent structures

The configuration that led us to the little *d* analysis, where a head appears to select two arguments both appearing to its right, is actually pretty common. In this section we will briefly discuss several other cases of head-initial structures in which the head interacts with two other elements in just the way D[DEF] does with NP and CP.¹²

Ditransitive verbs The first, of course, is the ditransitive verb construction V DP DP (*show Harvey the photos*). We have already noted that the vP-shell analysis of this construction was the inspiration for our dP-shell analysis of the Bare DCC.



The VP is complement of a higher functional head (little *v* in most current accounts); its two arguments are in specifier and complement positions to V, and the surface order is derived by head movement of V to *v*. Such an analysis is now widely accepted as an account of the ditransitive V construction.

Comparatives In the comparative construction (52, 53; see also 54, 55) the comparative clause is selected by the comparative morpheme (*more* in 52, 53), and therefore, as acknowledged, e.g. by Kennedy and Merchant (2000:102) the comparative clause should be an argument of *more*, as should the AP/NP/ADVP in the construction.

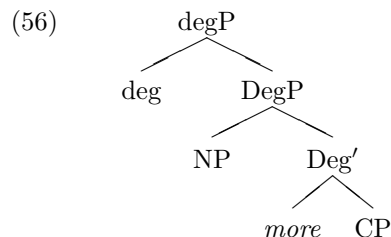
(52) The coat was *(more) expensive than I wanted it to be.

(53) {More/*The} cats than I could count were on the porch.

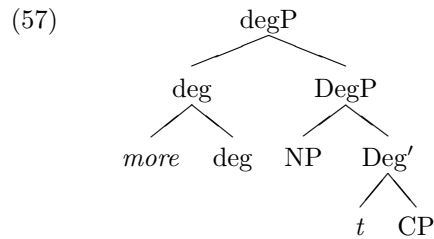
(54) The coat was less expensive than I wanted it to be.

(55) Sally is less afraid of goats than I am.

These requirements can be met if we assume that the Deg head *more*, like a ditransitive V, has its two arguments as specifier and complement in initial structure, as depicted in (56), and undergoes head raising to a higher head position (deg) as in (57):



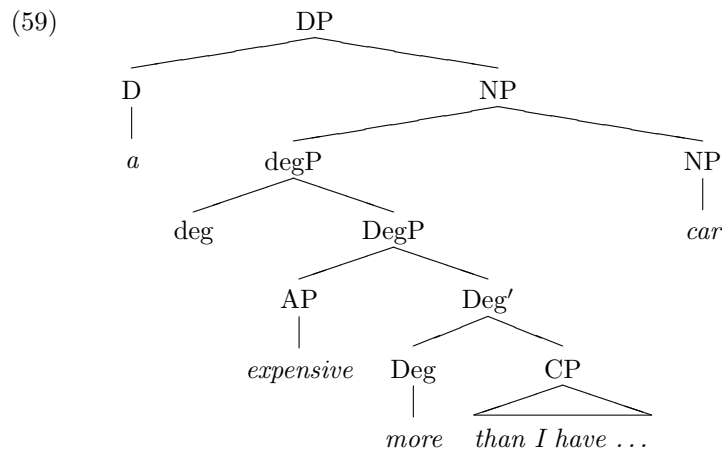
¹²Several of these cases are also given a similar treatment in Larson (1991).



Of course, the syntax of comparatives is enormously complex, and must involve other principles and operations to account for the order of elements in more complex examples such as (58):

(58) She has a more expensive car than I do.

which, according to our assumptions, would have an initial structure like:



with some interesting stuff hidden in the ..., and some obligatory extraposition of the CP, apparently to avoid being trapped inside a prenominal NP modifier. Our proposal is only intended to clarify the underlying relations between Deg and its arguments.¹³

As-comparatives The type of comparative construction exemplified in (60)–(61), like *more/less ... than ...* comparatives, is also bivalent:

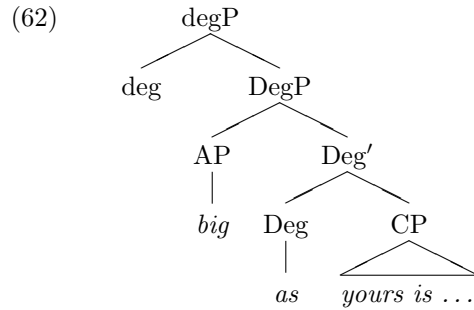
(60) My cat is (half) as big {as/*than/*that} yours is.

(61) My dog is as fond of tennis balls as yours is.

¹³Similar complexities arise in the other constructions considered in this section:

- i. as strong an argument as he could muster
- ii. too shitty a book to assign to a class
- iii. The man was so severely affected by hallucinations that we had to isolate him.

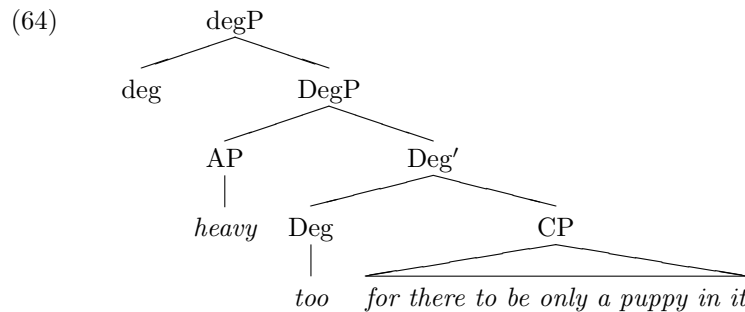
This leads to an analysis in which the first *as* is a Deg-like element, taking an AP specifier and a CP headed by *as* as a complement:



Too/enough Like the ordinary comparative construction, the too-Adj construction involves three elements, a functional head, a lexical head and its surrounding lexical phrase, and a CP, where the CP is licensed by the functional head, though they are superficially on opposite sides of the lexical head.

(63) **(too) heavy for there to be only a puppy in it.*

While the standard assumption these days is that the complement of *too* (a Deg) should be an AP, we propose instead (in essential agreement with Larson (1991, p.52)) that its complement is a CP, and the AP is a specifier:



The surface order is produced by head movement of Deg to the higher functional deg position. Note that, just as the proposed structure suggests, the A can have a complement of its own:

(65) Harvey's too full of shit for there to be any use talking to him.

(66) The man is too fond of his dog to even consider selling it.

The *enough* construction can be seen as the same structure, except that for some reason the Deg does not raise to the higher position:¹⁴

¹⁴Larson (1991) suggests that *enough* does raise in such constructions, and then an additional operation causes the Adjective to join it. Some support for this may come from the preferred order when A has a PP complement:

i. She is fond enough of chocolates that we better not leave her alone with a bag of them.

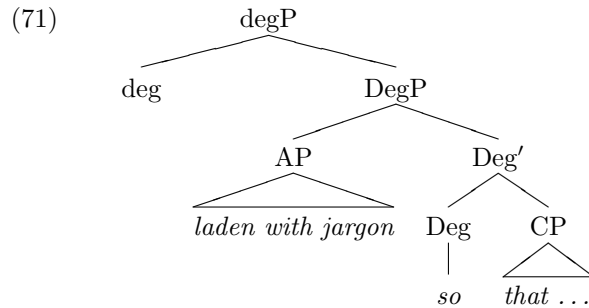
(The order *fond of chocolates enough* ... does not sound ungrammatical, but (i) is clearly preferred.)

- (67) That dog is mean enough that I wouldn't want to be left alone with him.
 (68) The rock is heavy enough to hold the lid on the can even on a windy day.

So ... that ... The Deg *so* takes an AP and a CP argument:¹⁵

- (69) His prose is *(so) laden with jargon that you can't understand it.
 (70) *(So) many people were talking that you couldn't hear a word at the lecture.

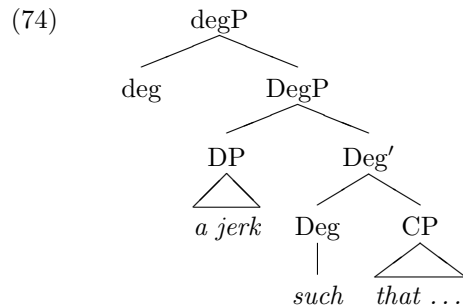
(70), of course, exhibits extraposition of the CP not only out of the DegP (as discussed in connection with (59) above), but also out of the subject DP all the way to the right. This, however, is just extraposition from DP. Before any extraposition, the structure we propose is (71):



such ... that ... Consider (72) and (73):

- (72) My cousin is *(such) a jerk that I want to be rid of him.
 (73) Such a clatter was heard on the rooftop that we sprang to the window to see what was the matter.

In this construction, the element *such* appears to be a kind of degree word that takes an indefinite DP and a that-CP as arguments. We might propose a structure something like (74):



¹⁵The *so ... that ...* construction is actually a member of a wider class of such constructions, all of which raise the same dependency issues:

- i. The interior was *(sufficiently) damaged that it would have to be completely redone.
- ii. The students were *(well enough) prepared that I didn't have to summarize the article.

Though we privately suspect that it is more complex than this, and that the DegP is really inside the DP, somehow modifying the NP *jerk*. In any case the bivalent nature of the *such . . . that* . . .-construction points to an analysis involving a deg-shell.

In this section we have examined a number of bivalent constructions in English, noting in each case that if we hold to the assumption that we started with, namely that selection is an indication of argument structure, we are led to an analysis involving a Larsonian-like functional shell. The similarity among all these constructions, that a superficially initial head seems to select two phrases which follow it, is the characteristic that they share with the Danish Bare DCC construction. We thus suggest that the solution to one is the solution to all.¹⁶

5 English DCCs

We have argued that the facts of Definiteness marking interaction with the presence vs. absence of P in Danish DCCs lead to an analysis positing two very different structures for anaphoric and referent-establishing DCCs. We have suggested that the d-shell structure we propose for referent-establishing DCCs is of a kind with structures needed for several different constructions in English. A natural question to ask at this point is whether, since the two DCC constructions in Danish have clear semantic differences, might not similar constructions in English show such differences as well, and might not the English DCCs have two different structures?

Of course, since the two overt symptoms of the different syntactic structures in Danish (Definite marking and the presence of P before CP) are absent in English, the evidence in English is going to be more subtle. We believe, however, that there are some indications of a duality of structure, and we present them here as an indication of possible directions for future research.

The examples in (75) below show that English has both referent-establishing and anaphoric DCCs (Hawkins, 1978). The a.-example involves a referent-establishing DCC, whereas the b.-example involves an anaphoric DCC.

- (75) a. We made the pledge that we would refrain from doing syntax.
 b. We broke the pledge that we would refrain from doing syntax.

The two differ in whether possessors are allowed:

- (76) We {denied/*made} Harvey's claim that his pig could fly.

whether they can be indefinite:

- (77) a. We resented the/*an allegation that the game was fixed.
 b. We made the/an allegation that the game was fixed.

and whether they can be plural:

- (78) We resented/*made the allegations that they were cheating.

There are furthermore some interesting (and we believe previously unnoticed) differences in extraposability:

¹⁶Someone braver than us might consider trying to extend this line of analysis to the notorious *hard nuts* construction (Berman 1974, Fleisher 2008, O'Flynn 2008): *That's going to be a tough nut to crack*.

- (79) a. The claim was made that pigs can fly.
 b. *Harvey's claim was denied that pigs can fly.

Interestingly, the anaphoric DCC can be paraphrased with a non-restrictive relative clause:

- (80) We denied Harvey's claim that pigs can fly.
 (81) We denied Harvey's claim, which was that pigs can fly.

The referent-establishing DCC cannot:

- (82) We made the claim that pigs can fly.
 (83) *We made the claim, which was that pigs can fly.

We do not propose to explore the structure of English DCCs in detail here, but simply point out that there are some indications of syntactic differences that are worthy of exploration.

6 Conclusion

The initial puzzle (the interaction between DCC construction (Bare vs. Prepositional) and definiteness marking) is solved. The Prepositional DCC receives suffixal definiteness marking because PPs attach high in Danish DPs, leaving N as a minimal sister of D. In Bare DCCs, N is not a sister of D, resulting in prenominal definiteness marking.

The proposed structures are consistent with earlier work on Scandinavian DPs showing that that PPs are never complement to N or D, but always adjoined to DP (Hankamer and Mikkelsen 2002, 2005, Julien 2005). The present paper thus adds to the growing body of evidence that PPs are always peripheral in the DP (Adger, 2012).

Taken together, the proposed structures account for all the puzzles and allow us to keep a strikingly simple characterization of definiteness marking.

We have identified a family of head-initial bivalent constructions which the head raising of Bare DCCs analysis extends naturally to, solving a long-standing set of puzzles about the selection properties of these constructions. In this brief study we looked only at English, but we are confident that similar structures are widespread crosslinguistically. Because definiteness shines a light on the structure of the Danish DCC, the DCC provides a clue about the structure of all these head-initial bivalent structures.

Turning again to English, we have uncovered some evidence that English has referent-establishing and anaphoric DCCs, that there are syntactic differences between them, and that Extraposition evidence suggests that they might differ in essentially the same way as the corresponding constructions in Danish.

Given its fruitfulness, we hope to have done a service by putting this understudied construction on the map. An investigation of similar phenomena in the other Scandinavian languages might shed further light on its properties.

References

- Adger, D. (2012). A syntax of substance. Monograph to be published by MIT Press.
- Barrs, A. and H. Lasnik (1986). A note on anaphora and double objects. *Linguistic Inquiry* 17, 347–354.
- Berman, A. (1974). *Adjectives and Adjective Complement Constructions in English*. Ph. D. thesis, Harvard University, Cambridge, MA.
- Fleisher, N. (2008). *Adjectives and infinitives in composition*. Ph. D. thesis, University of California, Berkeley.
- Grimshaw, J. (1990). *Argument Structure*. Cambridge, MA: MIT Press.
- Hankamer, J. and L. Mikkelsen (2002). A morphological analysis of definite nouns in Danish. *Journal of Germanic Linguistics* 14(2), 137–175.
- Hankamer, J. and L. Mikkelsen (2005). When movement must be blocked: A reply to Embick and Noyer. *Linguistic Inquiry* 36(1), 85–125.
- Hankamer, J. and L. Mikkelsen (2008). Definiteness marking and the structure of Danish pseudopartitives. *Journal of Linguistics* 44(2), 317–346.
- Hansen, E. and L. Heltoft (2011). *Grammatik over det Danske Sprog*, Volume III. Syddansk Universitetsforlag.
- Hawkins, J. A. (1978). *Definiteness and Indefiniteness: A Study in Reference and Grammaticality Prediction*. London: Croom Helm.
- Julien, M. (2005). *Nominal Phrases from a Scandinavian Perspective*. Amsterdam: John Benjamins.
- Larson, R. K. (1988). On the double object construction. *Linguistic Inquiry* 19(3), 335–391.
- Larson, R. K. (1991). The projection of DP and DegP. Unpublished manuscript, Stony Brook University.
- Marantz, A. (1984). *On the Nature of Grammatical Relations*. MIT Press.
- O’Flynn, K. (2008). Tough nuts to crack. Ms. Department of Linguistics, UCSC.