

Definiteness marking and the structure of Danish pseudopartitives*

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1 Introduction

Like several other Germanic languages, Danish has three partitive constructions:¹

i. Regular Partitive Construction:

- (1) a. en af turisterne
one of tourists-DEF
one of the tourists
b. en gruppe af turisterne
one group of tourists-DEF
one group of the tourists

ii. Direct Partitive Construction (DPC): [D N1 N2]

- (2) en gruppe turister
a group tourists
a group of tourists

iii. Indirect Partitive Construction (IPC): [D N1 P N2]

- (3) en gruppe af turister
a group of tourists
a group of tourists

The DPC and the IPC (= pseudopartitives) exhibit a strong surface similarity: both involve a D, an N1 that is a kind of measure noun, and an indefinite mass or plural N2. The only immediately obvious difference is

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¹The terms in i through iii come from van Riemsdijk (1998) and Vos (1999). We use the following glossing conventions: 1 = first person; CL = clitic; COM = common gender; DEF = definite; NEU = neuter gender; PL = plural; PRES = present; SG = singular.

the presence of a preposition in the IPC. There are, however, a number of less obvious differences between the two, which we shall examine in section 4.^{2,3}

The Danish pseudopartitive constructions exhibit an interesting interaction with definiteness marking: IPCs, but not DPCs, allow suffixal definiteness marking on N1 (Heltoft 1996:23, Kinn 2001:147).

- (4) **gruppen** af turister [IPC]
 group-DEF of tourists
the group of tourists
- (5) ***gruppen** turister [DPC]
 group-DEF tourists

We explore this interaction with three goals in mind: first, to provide a solution to the puzzle provided by the definiteness marking facts; second, to fill a descriptive gap in the literature on Germanic pseudopartitive constructions, which have been thoroughly studied in Swedish (Delsing 1993:185–224), Norwegian (Kinn 2001), English (Akmajian and Lehrer 1976, Selkirk 1977, Jackendoff 1977:119–126, Guéron 1979, Abney 1987:187–188, Corver 1998, Schwarzschild 2006, Grimshaw to appear), Dutch (van Riemsdijk 1998, Corver 1998, Vos 1999) and German (Löbel 1989, van Riemsdijk 1998, Vos 1999), but relatively little studied in Danish (though Daugaard (1994) provides a detailed corpus study); and third, to explore how the definiteness marking phenomena shed light on the structure of these partitive constructions, and also on larger theoretical issues such as the nature of extended projections.

There are several reasons why Danish is well placed to shed light on the structure of partitive constructions: English has only one pseudopartitive construction (the IPC) and only one way to mark definiteness; Dutch and German have both the DPC and the IPC, but only one way to mark definiteness; Danish, however, has both kinds of pseudopartitive construction and two ways of marking definiteness (prenominal article and post-nominal suffix), and definiteness marking behaves differently in the two pseudopartitive constructions. Earlier work (including Delsing 1993, Embick and Noyer 2001, Hankamer and Mikkelsen 2002, 2005, and Julien 2005) has established that definiteness marking is sensitive to structural relations between the definite D head and the N in its complement NP, so that definiteness marking provides a probe into the structure of the nominal projection. We exploit this below.

2 The puzzle

The puzzle hinted at in section 1 consists of three interrelated sets of facts. First is that the N1 of the IPC can bear the definite suffix (6), while the N1 of the DPC cannot (7):

- (6) **gruppen** af turister [IPC]
 group-DEF of tourists
the group of tourists
- (7) ***gruppen** turister [DPC]
 group-DEF tourists

If there is a prenominal adjective present, both the IPC and the DPC may have the definite article:

²We will have little to say about the Regular Partitive Construction, which seems to behave just like its English counterpart (Ladusaw 1982, Hoeksema 1996, de Hoop 1998). Our investigation focuses on the two pseudopartitive constructions DPC and IPC. The DPC is also called a juxtapositional pseudopartitive and the IPC a prepositional pseudopartitive. The term pseudopartitive is due to Selkirk (1977:302).

³Despite superficial similarities, the difference between the IPC and the DPC is fundamentally different from the one observed for English *2 liters of oil* vs. *90 degree oil* by Schwarzschild (2002, 2006), and has nothing to do with monotonicity.

(8) **den** store gruppe af turister [IPC]
 DEF large group of tourists
the large group of tourists

(9) **den** store gruppe turister [DPC]
 DEF large group tourists
the large group of tourists

This is as expected, since a prenominal adjective always blocks the suffixed form, cf. Delsing (1993:75), Embick and Noyer (2001:580–581), Hankamer and Mikkelsen (2002:139, 2005:87–88).

The second puzzling fact is that in the absence of modifiers neither the IPC nor the DPC can have the prenominal definite article:⁴

(10) ***den** gruppe af turister [IPC]
 DEF group of tourists

(11) ***den** gruppe turister [DPC]
 DEF group tourists

This is puzzling because all previous analyses (including Delsing 1993, Embick and Noyer 2001, Hankamer and Mikkelsen 2002, 2005) have in one way or another analyzed the distribution of the definiteness markers so that the prenominal article is an elsewhere case, arising whenever the definite suffix cannot be realized. Thus the ungrammaticality of (10) is expected given (6), but the ungrammaticality of (11) is a mystery given (7).

The third part of the puzzle is that prenominal definiteness marking is allowed in both IPCs and DPCs in the presence of a restrictive relative clause:

(12) **den** gruppe af turister som netop ankom [IPC]
 DEF group of tourists that just arrived
the group of tourists that just arrived

(13) **den** gruppe turister som netop ankom [DPC]
 DEF group tourists that just arrived
the group of tourists that just arrived

The first part of the puzzle ((6) vs. (7)) is the main puzzle and we propose a solution to it in section 5, after reviewing a range of relevant properties of the two pseudopartitive constructions in section 4. The solution to the third part of the puzzle (why both constructions can occur with a prenominal definiteness marker in the context of a restrictive relative clause) turns out to follow directly from our earlier proposals about the structure of restrictive relative clauses in Danish (Hankamer and Mikkelsen 2005). We present that solution, together with other consequences of our analysis in section 6. There we also examine one remaining part of the puzzle, namely the ungrammaticality of (11), and suggest that it requires a semantic solution. In section 7, we conclude with a brief summary of our analysis, and some pointers toward future research.

⁴(10) and (11) are both grammatical if *den* is stressed, but then it is unambiguously the demonstrative D, not the definite article.

3 Background

3.1 Definiteness marking in Danish

We adopt the analysis of definiteness marking developed in Hankamer and Mikkelsen (2002, 2005), according to which the definite suffix is found when the definite D is in direct construction with (i.e., sister to) N; the pronominal article is found elsewhere:

- | | |
|---|---|
| <p>(14) a. gruppen
group-DEF
<i>the group</i></p> <p>b. *den gruppe
DEF group</p> | <p>c.</p> <pre> DP / \ D[def] N/P </pre> |
| <p>(15) a. *store gruppen
big group-DEF</p> <p>b. den store gruppe
DEF large group
<i>the large group</i></p> | <p>c.</p> <pre> DP / \ D[def] NP / \ AP N/P </pre> |
| <p>(16) a. forfatteren [til bogen]
author-DEF to book-DEF
<i>the author of the book</i></p> <p>b. grisen [med blå pletter]
pig-DEF with blue spots
<i>the pig with blue spots</i></p> | |
| <p>(17) den forfatter [som vandt prisen i fjor]
DEF author who won prize-DEF in last-year
<i>the author who won the prize last year</i></p> | |

When there are no modifiers, the definite D is in direct construction with N, as in (14).⁵ The definite suffix is licensed, and the pronominal definite article is prohibited. When there is a pronominal adjective, as in (15), the definite D is not in direct construction with N (the NP sister of D is not minimal), and the definite suffix is not licensed. Only the pronominal article is possible. In the case of postnominal PP complements and modifiers, as in (16), we assume, following Hankamer and Mikkelsen (2005:111–113, 118), that such postnominal PPs are always adjoined at some level higher than NP, and consequently the D and N are in direct construction, licensing the postnominal definite suffix. As for restrictive relative clauses, as in (17), we assume that they are derived by a DP raising analysis which insures that the D and N are not in direct construction, thus permitting the pronominal article (Hankamer and Mikkelsen 2005:113–116). We return to the analysis of relative clauses in section 6.2.

⁵In (14c), and throughout, we use N/P to indicate an NP that is simultaneously minimal and maximal in the sense of Bare Phrase Structure (Chomsky 1994). In (14), the NP is minimal because it contains only the lexical item *gruppe* and it is maximal, because it has no unchecked selectional features. Building on the Alternative Distributed Morphology analysis developed in Hankamer and Mikkelsen (2005), we propose that the latter property is what allows *gruppe* to serve as a complement to D and that the former property is what allows it to bear the definite suffix.

3.2 The semantic range of pseudopartitives

As noted in the introduction, pseudopartitives are not unique in involving two nominals. Regular partitives may do so as well, as shown in (18).

(18) et antal af boligerne [Regular Partitive Construction]
 a number of homes-DEF
a number of the homes

(19) a. et antal boliger [DPC]
 a number homes
a number of homes

b. et antal af boliger [IPC]
 a number of homes
a number of homes

However, there is an intuitive meaning difference between regular partitives and pseudopartitives: whereas regular partitives refer to a subpart of a whole or a subset of a previously established set (some specific set of homes in (18)), IPCs and DPCs refer to a portion of some substance, collection, or kind (homes in (19)). In a pseudopartitive, N1 establishes the unit of measurement and N2 signifies the type of substance or entity that is being measured (Löbel 1989:155, Koptjevskaja-Tamm 2001:526–527, Schwarzschild 2006:81). This characterization provides a natural understanding of why the substance noun is definite in regular partitives (*boligerne*), but indefinite in pseudopartitives (*boliger*).

Most studies of pseudopartitives further subcategorize these according to the kind of N1 involved. Koptjevskaja-Tamm (2001:530), for instance, distinguishes seven kinds of pseudopartitives based on semantic properties of N1 (see also the classifications in Delsing 1993:203–211, Daugaard 1994:54, van Riemsdijk 1998:13, and Kinn 2001:86–101).⁶ This subcategorization is relevant for capturing two facts about Danish pseudopartitives: whereas DPC is possible with N1s from all seven semantic categories, the IPC is possible only with a subset of N1 categories. Furthermore, which preposition is used in the IPC (*af* ‘of’ or *med* ‘with’) correlates with N1 categories (see Daugaard (1994:49–50), Koptjevskaja-Tamm (2001:550), and especially Kinn (2001:151–179) for relevant discussion). Despite this variation between the seven categories as to whether the N1 also occurs in IPCs and if so which preposition is used, all seven categories exhibit a systematic behavior with respect to definiteness marking. No DCPs allow a definite suffix on N1, and all IPCs do:

(20) a. *D N1-DEF N2 (for all N1s)
 b. D N1-DEF *af/med* N2 (for all N1s allowed in the IPC)

Thus the semantic subcategorization of pseudopartitives is irrelevant for our purposes: suffixal definiteness marking on N1 is impossible in DPCs and possible in IPCs, regardless of semantic category. In what follows we will therefore not distinguish these subcategories, except when properties of just one of them is at issue (as in the discussion of inflectional deficiency in section 4.3). As far as we can tell, the remaining parts of the definiteness puzzle (see (8)–(13)) are also observed consistently across the semantic categories.

⁶Koptjevskaja-Tamm’s categories, with Danish examples in parentheses, are: conventionalized measures (*liter* ‘liter’; *kilo* ‘kilo’), abstract quantity nouns (*mængde* ‘quantity’; *antal* ‘number’), containers (*kop* ‘cup’; *æske* ‘box’), fractions/parts (*skive* ‘slice’; *stykke* ‘piece’), quanta (*klump* ‘lump’; *dråbe* ‘drop’), collections (*flok* ‘flock’; *gruppe* ‘group’), and forms (*bunke* ‘pile’; *buket* ‘bouquet’).

4 Properties of Danish pseudopartitives

In this section we lay out the characteristic properties of Danish IPCs and DPCs. The generalization that emerges from these is that N1 of an IPC behaves like a regular noun, whereas N1 of a DPC does not. This is the starting point for the syntactic analysis we propose in section 5.

4.1 Prosody

As observed by Grønnum (1998:206), Koptjevskaja-Tamm (2001:553), and Kinn (2001:126), N1 has regular word stress in the IPC, but is destressed in the DPC:

- (21) en 'gruppe af 'turister [IPC]
a group of tourists
- (22) en ₀gruppe 'turister [DPC]
a group tourists

In contrast, N2 carries regular word stress in both the IPC and the DPC.

4.2 Restrictions on N1

As noted in section 3.2, some items occur as N1 in the DPC, but not as N1 in the IPC. Representative examples are given below:

- (23) en liter (*af) vand
a liter of water
- (24) et kilo (*af) smør
a kilo of butter
- (25) et par (*af) turister
a pair of tourists

Daugaard (1994:49–50) reports that of the 260 items that can occur as N1 in a Danish DPC, only 95 were also attested as N1 of an IPC in the corpus of 4 million words that he examined. This clearly indicates that we need to distinguish the N1 of a DPC from the N1 of an IPC, even though many items can take on both roles.

4.3 Inflectional deficiency

In his study of Swedish pseudopartitives, Delsing (1993:204) makes the interesting observation that some of the items that can only occur in the DPC are inflectionally deficient in the sense that they do not have a plural form distinct from the singular. The same is true for Norwegian (Kinn 2001) and for Danish, as the following examples show (we know from (23) above that *liter* occurs only in the DPC):

- (26) a. en liter vand
one liter water
- b. tre liter vand
three liter water
- c. *tre liter-er/liter-e vand
three liter-PL/liter-PL water

This behavior is strongly reminiscent of classifiers, which characteristically occur in plural noun phrases without showing plural agreement. We are not claiming that *liter* is a classifier, but we do take the lack of plural marking to indicate that *liter* is not a regular lexical noun, but rather belongs in some functional nominal category.

Danish exhibits another interaction between plurality and pseudopartitives which to our knowledge has not been observed before. Many items that occur freely as N1 in DPCs when singular do not occur, or occur much less frequently, when plural. In IPCs, this preference for singular over plural is not observed, as shown in (27).⁷

(27)	DPC	IPC
<i>flok</i> (flock-SG)	97	3
<i>flokke</i> (flock-PL)	0	9
<i>gruppe</i> (group-SG)	73	17
<i>grupper</i> (group-PL)	1	21
<i>pose</i> (bag-SG)	29	1
<i>poser</i> (bag-PL)	1	3
<i>stabel</i> (pile-SG)	11	1
<i>stabler</i> (pile-PL)	0	12

Unlike N1s like *liter*, which cannot be morphologically plural at all (see (26c)), N1s like *pose* can be morphologically plural, but rarely occur in DPCs when plural. The one plural example found with *pose* in the corpus is given in (28):

- (28) Der er faktisk næsten dobbelt så mange **poser** kartofler, der ikke overholder kravene,
 there be-PRES actually almost double as many bags potatoes that not obey requirements.DEF
 som i fjor.
 as in last.year
There are actually almost twice as many bags of potatoes that do not meet the requirements as last year.

This example is typical in that plural marking on N1 is accompanied by some kind of a plural determiner or quantifier (here *dobbelt så mange*; twice as many). Of the 58 examples of DPCs with a plural N1 that we found in the corpus, 57 involved a plural determiner or quantifier. In contrast, plural N1s occur regularly in IPCs without any (overt) plural determiner or quantifier, as in (29).

- (29) Børn samler de sære ting op, som ligger og ser fremmede ud på fortovet. Konservesdåser
 kids pick the strange things up that lie and see foreign out on side.walk.DEF canned.goods
 og **poser** med mel.
 and bags with flour
Kids pick up the strange things that are lying on the sidewalk looking unfamiliar. Canned goods and bags of flour.

We interpret these quantitative patterns to mean that number morphology on N1 is disfavored by the DPC, but not by the IPC. This can be seen as a second indication that N1 is less noun-like in the DPC than in the IPC, since regular nouns occur freely in the plural, with or without a plural determiner.

⁷Frequency data from DK87-90, a 4 million word corpus of written Danish. Similar patterns are found with *bakke* (tray), *bundt* (bunch), *buket* (bouquet), *bunke* (heap), *flaske* (bottle), *kasse* (box), *kop* (cup), *masse* (mass), *pakke* (pack), *samling* (collection), *stak* (stack), and *stump* (piece).

4.4 Agreement

There are two domains of agreement to consider in connection with pseudopartitives: internal agreement (between D and N1 and/or N2) and external agreement (between the pseudopartitive as a whole and other elements in the clause). The latter in particular has played a prominent role in the literature as a key diagnostic for determining the syntactic head of pseudopartitives. In Danish the agreeing features are number (singular vs. plural) and gender (neuter vs. common).

The facts of internal agreement are clear-cut: in both DPCs and IPCs the determiner agrees with N1 for number and gender, never with N2. In (30), for instance, where N1 is common gender and N2 neuter, D must have the common gender form *en*; the neuter form *et* is impossible.

- (30) *en* / **et* *spand* (*med*) *vand*
 a-COM / a-NEU bucket-COM with water-NEU
 a bucket of water

The pattern of external agreement, which in Danish is restricted to predicate adjectives, is much less clear. We investigated the judgments of two speakers in some detail (obtaining judgments on 110 examples from each speaker) but the results were inconclusive and we therefore do not report them here.

4.5 Summary

In this section we have established various similarities and differences between the DPC and the IPC in Danish. The two behave similarly with respect to (internal) agreement, but differ with respect to prosody, lexical range, and number inflection. The differences all concern the behavior of N1 and can be summarized by stating that N1 behaves like a regular noun in the IPC, but not in the DPC.

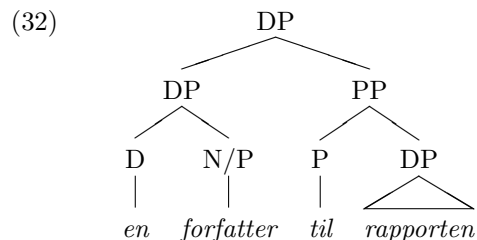
5 Structure of Danish pseudopartitives

To account for the facts laid out in section 4, we propose two different structures for the IPC and the DPC. Though we arrived at these structures on independent grounds, the essence of our proposal is strikingly similar to the one Löbel (1989) makes for German pseudopartitives. There are also similarities with van Riemsdijk's (1998) analysis of German and Dutch pseudopartitives, which we discuss in section 6.3.

5.1 Structure of the IPC

Hankamer and Mikkelsen (2005:118) argue that the structure of a nominal phrase with a complement PP, such as (31), is as in (32), with PP adjoined to DP:

- (31) *en forfatter til rapporten*
 a author to report.DEF
 an author of the report



The motivation for the assumption of structure (32) in Hankamer and Mikkelsen (2005) is connected to our analysis of definiteness marking in Danish (cf. section 3.1). If, as we have argued, the primary condition for postnominal realization of the definite morpheme is a sisterhood relation between D and N, we are forced to conclude that postnominal PPs, whether modifiers or complements, must adjoin higher than NP, because their presence does not license the prenominal definite article ((33b) is grammatical if *den* is stressed, but in that case *den* is a demonstrative, not the definite article; see fn. 4):

- (33) a. forfatter**en** til rapporten
 author-DEF to report.DEF
the author of the report
- b. ***den** forfatter til rapporten
 DEF author to report.DEF

According to standard definitions, of course, these PPs are not complements of N, since they are not sisters of N. They are, however, located within N’s extended projection (in the sense of Grimshaw 1991, 2005) and we assume that they can be selected by N. An alternative, which we have not pursued, would be to assume that these PPs originate as sister to N and undergo an obligatory extraposition (or a version of “late merger” (Fox and Nissenbaum (1999), Fox (2002), Bhatt and Pancheva (2004))) to a higher position in the DP. This is essentially what Julien (2005:67–69) proposes to account for the use of the definite suffix with argument PPs. If we adopted either of these alternatives, we would have to assume that after such movement there is a reduction in structure (a form of tree pruning (Ross 1966)) in order to guarantee that at the point of Vocabulary Insertion D and N are in direct construction. It seems most straightforward to assume that “complement” PPs are merged initially as adjuncts to DP, and that selection by the lexical head can extend to elements merged in that position.

Our proposal here is that the IPC has just this structure:⁸

- (34) a. en gruppe af turister
 a group of tourists
a group of tourists
- b.
-
- ```

graph TD
 DP1[DP] --- DP2[DP]
 DP1 --- PP[PP]
 DP2 --- D[D]
 DP2 --- NP[N/P]
 D --- en[en]
 NP --- gruppe[gruppe]
 PP --- P[P]
 PP --- DP3[DP]
 P --- af[af]
 DP3 --- turister[turister]

```

Given this structure for the IPC, we expect the following:

- i. D should agree with N1, since N1 is the head of D’s complement.
- ii. N1 should have ordinary word stress, since it is a regular noun.
- iii. N1 should show plural inflection, since it is a regular noun.
- iv. N1-DEF should be possible in IPCs (as in D-N-PP generally), since D is sister to a minimal NP.

<sup>8</sup>A reviewer points out that in view of the fact that the complement of the P in an IPC never has an overt determiner, that complement might be something smaller than a DP. As far as we can tell, such a structure, together with our other assumptions, would account for the IPC data equally well.

These expectations are all fulfilled: (i) is verified by (30), (ii) by (21), (iii) by (35), and (iv) by (6).

- (35) a. to spand-e med vand  
two bucket-PL with water  
*two buckets of water*  
b. \*to spand med vand  
two bucket.SG with water

In short, the IPCs share the properties of ordinary N+PP complement constructions, because they have the same structure. This similarity extends to adjectival modification of N. In both IPCs and other N+PP structures, N can be modified by a preceding adjective, and when it is, only prenominal definiteness marking is possible:

- (36) a. **den** yngste forfatter til rapporten  
DEF youngest author to report.DEF  
*the youngest author of the report*  
b. \*yngste forfatter**en** til rapporten  
youngest author.DEF to report.DEF
- (37) a. **den** store gruppe af turister [= (8)]  
DEF large group of tourists  
*the large group of tourists*  
b. \*store gruppen af turister  
large group.DEF of tourists

Under the analysis proposed here, the ungrammaticality of the b. examples is due to the general restriction that the definite suffix is only found when D[def] has as its sister a minimal N. This restriction is not met in the b. examples since the NP sister of D[def] contains an AP modifier.

Two further points deserve mention. First, the restriction on P in IPCs to *af* or *med* can be understood as a case of l-selection; PP is not a classical complement of N1, but it can be l-selected because it is within N1's extended projection. Second, since the complement of P is a DP, it should be possible for N2 to be accompanied by a determiner including a definite article. While we have not investigated the Regular Partitive Construction in detail, it seems reasonable to assume that the Regular Partitive Construction is just what we have when the second DP in the IPC contains a definite article:

- (38) en gruppe af [turister**ne**]  
a group of tourist-PL-DEF  
*a group of the tourists*
- (39) en gruppe af [**de** netop ankomne turister]  
a group of DEF just arrived tourists  
*a group of the recently arrived tourists*

## 5.2 Structure for the DPC

The real task is to propose an analysis of the DPC which will account for the ways in which it differs from the IPC. Our proposal, in essence, is that N1 in the DPC is not a regular N, but a functional category, which we will call *n*,<sup>9</sup> which takes NP as a complement.

<sup>9</sup>Various authors have proposed nominal functional categories and called them *n* (e.g. Julien 2005). Our little *n* could be just one of a whole family of little *ns*. Within the literature on pseudopartitives, our *n* corresponds fairly closely to Löbel's (1989) Q[+N] category and to van Riemsdijk's (1998) *N<sub>S</sub>*.

The DPC, then, is one extended nominal projection in the sense of Grimshaw (1991, 2005), or one M-projection in the sense of van Riemsdijk (1998) and Vos (1999).

- (40) a. *en* *gruppe* *turister*  
 a group tourists  
 a group of tourists
- b.
- 
- ```

graph TD
  DP --> D["D  
en"]
  DP --> nP["nP"]
  nP --> n["n  
gruppe"]
  nP --> NP["N/P  
turister"]
  
```

Given the structure in (40), we have a different set of expectations for DPCs:

- i. We expect D to agree with N1, just as in the IPC, since N1 (= n) is the head of D's complement, and we assume that n has inherent gender features.
- ii. The prosodic weakness of N1 is expected since functional categories are typically prosodically weak (Selkirk 1996).
- iii. Similarly, the inflectional deficiency of N1 is not surprising since functional categories are often inflectionally deficient (see Roberts and Roussou (2002) and references cited there).
- iv. The impossibility of N1-DEF follows from the structure (and the general condition on the distribution of the definite suffix reviewed in section 3.1): D[def] is not the sister of a minimal N.
- v. The impossibility of N2-DEF (**en gruppe turisterne* 'a group tourists-DEF') is accounted for, because n takes a NP, not DP, as complement.

We now have a solution to the first definiteness puzzle. Since N1 of the IPC is a regular N, and the structure of the IPC is just that of a nominal phrase containing a PP complement, the N1 of the IPC can bear a definite suffix: it is of the right category (N), and occurs in the right configurational relationship with D at spell-out (see (41)). The N1 of the DPC cannot bear the definite suffix, on the proposed analysis, because it is not in direct construction with D at spell-out; as (41) shows, this is because its complement is NP rather than PP, and NP, unlike PP, never adjoins to DP.¹⁰

- (41) a. IPC:
-
- ```

graph TD
 DP1[DP] --> DP2[DP]
 DP1 --> PP[PP]
 DP2 --> D[D]
 DP2 --> NP1[N/P]
 PP --> P[P]
 PP --> DP3[DP]

```
- b. DPC:
- 
- ```

graph TD
  DP4[DP] --> D4[D]
  DP4 --> nP[nP]
  nP --> n[n]
  nP --> NP[NP]
  
```

¹⁰Under the alternative assumption (discussed below (33)), that the PP complements in the IPC arrive at their higher location via extraposition, we would need an account of why NP complements in the DPC cannot similarly extrapose. This, we believe, would not be a serious obstacle, because there are good reasons to believe that NP is not a moveable category. While DPs clearly can move if anything can, and PPs can move out of DPs, NPs are never observed to move out of DPs; also, when there is good reason to assume that a nominal phrase is a bare NP not encased in a DP shell, as is the case of generic objects in Turkish (Eskenaazi 1996), those NPs never move. So we think it is not unreasonable to assume that NPs cannot extrapose. If Chomsky's (2001:14) conjecture that only phases move is correct, this property would follow from the assumption that NP is not a phase.

In the particular DPC diagrammed in (40), the NP complement of *n* is minimal, as indicated by the N/P notation. In (41b) we represent the complement of *n* as NP to reflect the fact that this NP may but needn't be minimal. In particular, the NP complement of *n* can contain an adjectival modifier, as shown in (42).

- (42) en gruppe [ustyrlige turister]
 a group unruly tourists
a group of unruly tourists

Similarly, *nP* can be modified by an adjective, which we take to involve left-adjunction of AP to *nP*:

- (43) a. en [stor gruppe] turister
 DEF large group tourists
a large group of tourists
 b. den [store gruppe] turister [= (9)]
 DEF large group tourists
the large group of tourists

The analysis also allows us to account for one more fact from section 4, namely that not all the nominals that can occur as N1 in the DPC can occur as N1 in the IPC. These nominals (*liter*, *kilo*, *par*) exist as *n*'s, which is why they can occur in the DPC. We might assume that they also exist as N's, but N's which do not *c*-select a PP complement, or, perhaps more radically, that they do not exist as N's at all. Either way, they would not occur in the IPC.

6 Consequences

Having accounted for several of the core puzzles concerning the differences between the IPC and the DPC, we now turn to some further consequences of our analysis. In section 6.1 we examine a difference between the IPC and the DPC in the distribution of additive particles, and show that our analysis accounts for this difference straightforwardly. In section 6.2 we examine the interaction between prenominal definiteness marking and relative clauses, and show that the observed behavior follows from independently motivated assumptions about relative clause formation. In section 6.3 we discuss a consequence of our analysis for an aspect of the theory of extended projections. In 6.4 we return to the remaining bit of the original puzzle, the fact that in the DPC, when there is not a relative clause present, neither the prenominal definite determiner nor the definite suffix is permitted, and suggest a way to account for this fact that is consistent with our overall analysis.

6.1 Distribution of additive particles

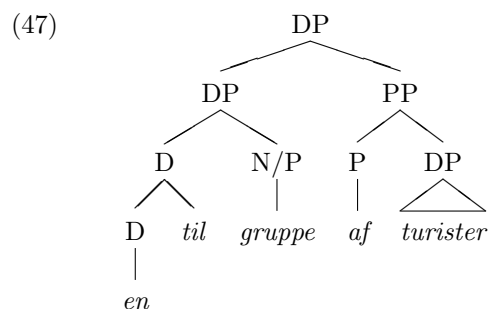
As observed for Norwegian by Kinn (2001:150), DPCs and IPCs differ in the possible positions of additive particles like *til* (more). The same is true for Danish. In general, additive particles occur immediately after D or at the end of the DP:

- (44) a. en **til** røget fisk
 one more smoked fish
one more smoked fish
 b. en røget fisk **til**
 one smoked fish more
one more smoked fish

As (45a,b) and (46a,b) show, these two positions are available in both the IPC and the DPC.¹¹ IPCs, moreover, allow the additive particle to occur between between N1 and N2 (45c); DPCs do not, as seen in (46c).

- | | | | |
|------|--|------|--|
| (45) | IPC | (46) | DPC |
| | a. en til gruppe af turister
one more group of tourists
<i>one more group of tourists</i> | | a. en til gruppe turister
a more group tourists
<i>one more group of tourists</i> |
| | b. en gruppe af turister til
a group of tourists more | | b. en gruppe turister til
a group tourists more |
| | c. en gruppe til af turister
a group more of tourists | | c. *en gruppe til turister
a group more tourists |

This pattern generalizes to the additive particles *mere* (more) and *ekstra* (extra) and to the ‘subtractive’ particles *mindre* (less) and *færre* (fewer). Given the structures for the IPC and the DPC proposed above, we suggest that these facts can be understood as follows. Additive particles right-adjoin to D, in essence creating a complex quantifier. If no further operations target the additive particle, we have the structures in (47) and (48), which give rise to (45a) and (46a), respectively.

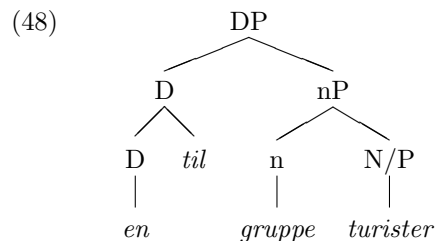


¹¹ (45b) is slightly less natural than (45a) and (45c). We believe this to be an effect of placing a very light element at the end of a rather heavy phrase. Support for this interpretation comes from two observations. First, the unnaturalness increases as the rest of the phrase grows larger:

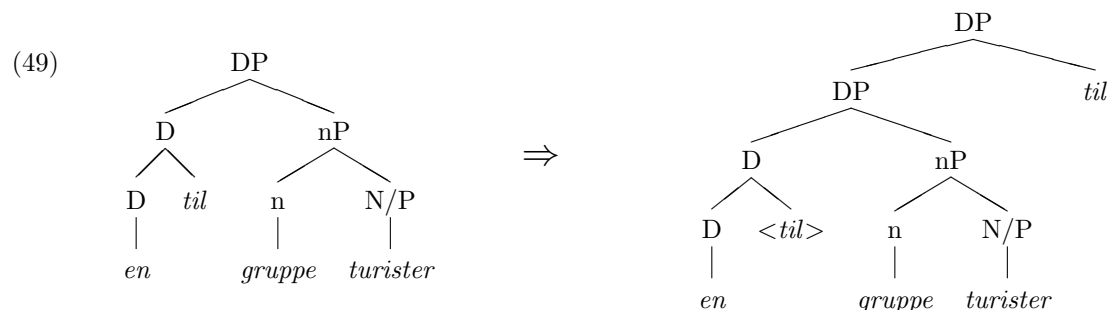
- i. en (til) meget stor gruppe (til) af helt ustyrlige turister (??til)
 one more very large group more of completely unruly tourists more
one more group of completely unruly tourists

Second, the unnaturalness decreases if the particle itself is heavier. Thus replacing monosyllabic *til* in (45b) with disyllabic *ekstra* (extra) restores it to full acceptability.

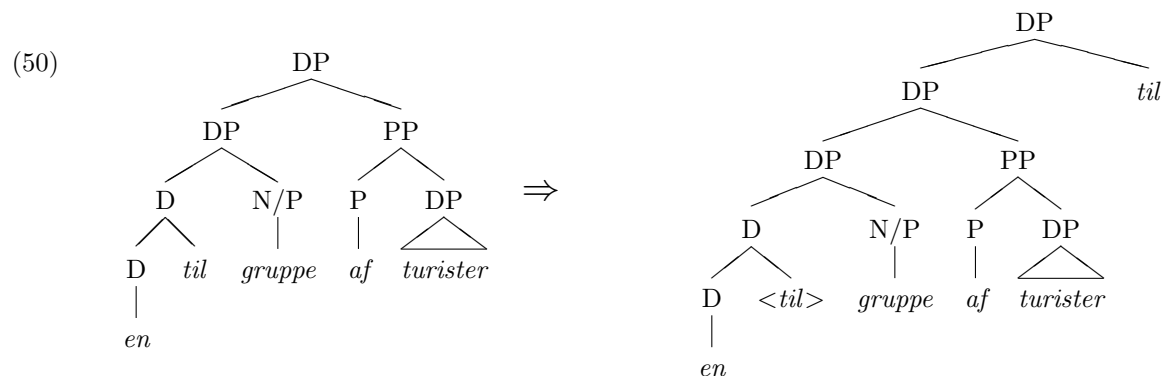
Placing *til* phrase-finally in the DPC corresponding to (45b), as in (46b), is not associated with any unnaturalness. We can see three possible reasons why DPCs are different from IPCs in this respect, all of which are consistent with what we say about (45b) above. First, there is less material preceding *til* in (46b) compared with (45b). Second, and more importantly, there is only one stressed element separating D and *til* in (46b), namely *turister*, whereas there are two in (45b): *gruppe* and *turister* (see examples (21) and (22) in section 4.1). Finally, and rather speculatively, it is conceivable that the lack of an intermediate position for *til* in DPCs improves the acceptability of having *til* in final position. More work is needed to establish which, if any, of these three factors are involved and how they might interact. For present purposes we continue to assume that (45b) and (46b) are both grammatical and that whatever contrast native speakers perceive between them can be understood in terms of one or more of the factors mentioned above.



We further propose that additive particles may extrapose to right-adjoin to DP.¹² The ability of these particles to adjoin either to a head (D⁰) or to a maximal projection (DP) could be understood as a consequence of such particles' being simultaneously minimal and maximal in the sense of Bare Phrase Structure (Chomsky 1994), and hence able to behave either as heads (X⁰s) or as maximal projections (XPs). For DPCs, extraposition of the additive particle yields the derivation in (49), which corresponds to (46b).

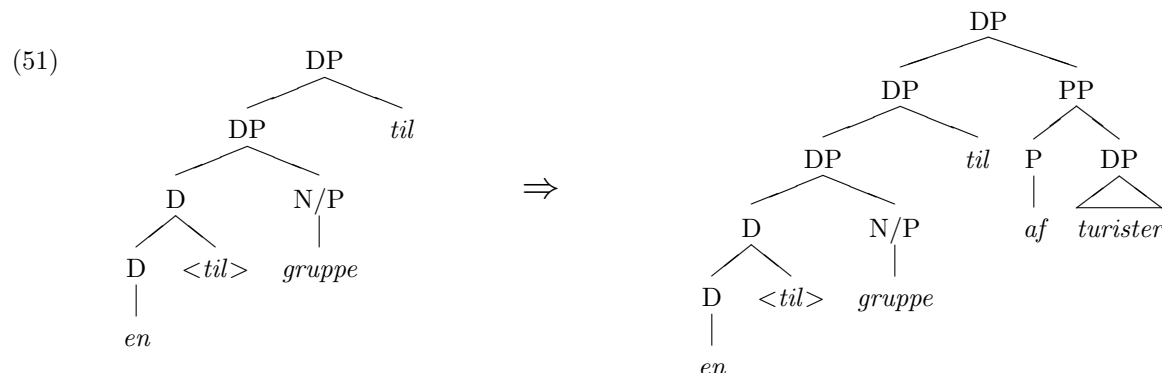


For IPCs there are two options, depending on whether extraposition of the additive particle precedes or follows adjunction of the PP. (50) gives the derivation where particle extraposition follows PP adjunction. This results in (45b):



If instead the particle extraposes first, we obtain the derivation in (51) and the word order in (45c).

¹²A reviewer questions why a light particle like *til* should extrapose. The observations in footnote 11 lend some support to the idea that extreme rightward (i.e. phrase-final) positioning of these particles is sensitive to weight, at least when it comes to judgments of naturalness. On the other hand, rightward movement of light elements is not unknown: on at least one conception, English Particle Movement involves rightward movement of a light particle and in Irish prosodically weak pronouns move to the right (see McCloskey (1999) and references cited there). It is also worth noting that our account of the contrast in particle positions in the DPC and the IPC does not depend on extraposition per se. One could alternatively assume that additive particles may adjoin to D⁰ or to DP. In that case the account of (45b) and (45c) proposed below should be restated in terms of the timing of the adjunction of the particle and of the PP to DP.



We now have an account of why all three word orders in (45) are possible. It relies on three assumptions, all of which seem reasonable to us. First, that IPCs involve adjunction of PP to DP; this is a cornerstone of the solution to the first definiteness puzzle and a consequence of the general analysis of definiteness marking in Hankamer and Mikkelsen (2002, 2005). Second, that an additive particle may, but needn't, extrapose to the end of DP; something like this assumption seems necessary to explain the basic facts in (44). Third, that there are no restrictions on the order in which additive particles extrapose and PPs adjoin, which seems to us to be the null hypothesis. Since we propose that IPCs have the same syntactic structure as any noun phrase where N takes a PP complement, we expect the latter to show the same distribution of additive particles. This is indeed the case, as (52) demonstrates. (As is the case with IPCs, the phrase-final position of *til* in (52b) is slightly less natural than the other two positions; see footnote 11.)

- (52)
- a. en **til** ven af familien
 one more friend of family-DEF
one more friend of the family
 - b. en ven af familien **til**
 a friend of family-DEF more
 - c. en ven **til** af familien
 a friend more of family-DEF

As for why *til* cannot occur in the intermediate position in DPCs, the answer can now be shown to follow from the analysis of the intermediate position proposed for IPCs in (51), together with the assumption made in section 5.2 that NPs never adjoin to DP. (51) shows that the intermediate position of *til* relies on the PP adjoining to DP after *til* extraposes. If the NP in a DPC never adjoins to DP, but always merges as the sister of N, there is no way to derive the intermediate position of *til*: *til* either occurs immediately after D, as in (48), or after N2, as in (49). These analytical options correspond precisely to the empirically observed pattern in (46).

6.2 Prenominal definiteness marking and relative clauses

Recall that IPCs and DPCs differ with respect to postnominal definiteness marking, but both occur with the prenominal definite article in the context of a restrictive relative clause:¹³

¹³In the case of the DPC in (54) it seems accurate to say the restrictive relative clause licenses a definite article per se, since no definite article is possible without the restrictive relative clause, whether prenominal, see (11), or postnominal, see (7). As regards the IPC, a definite article is possible in the absence of a restrictive relative clause, but in that case it must be realized as a definite suffix (see (6) and (10)). What (53) and (54) show is that the presence of a restrictive relative clause licenses a prenominal definite article in both the DPC and the IPC in Danish. The goal of this section is to provide an account of this

(53) **den** gruppe af turister som netop ankom [IPC]
 DEF group of tourists that just arrived
the group of tourists that just arrived

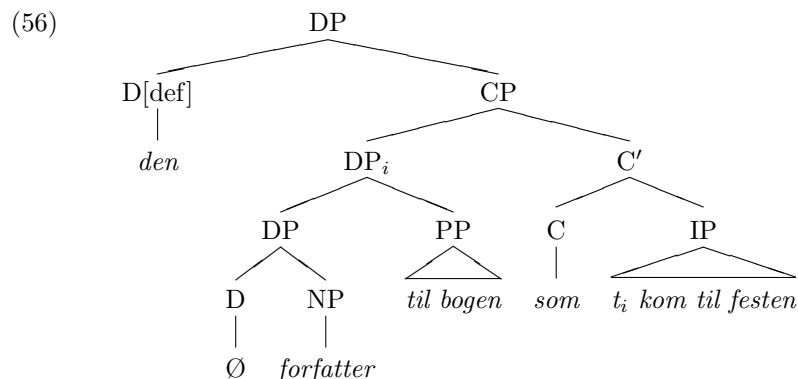
(54) **den** gruppe turister som netop ankom [DPC]
 DEF group tourists that just arrived
the group of tourists that just arrived

In DPs in general a restrictive relative clause licenses prenominal definiteness marking:

- (55) a. forfatter**en** [til bogen]
 author-DEF to book-DEF
the author of the book
 b. ***den** forfatter [til bogen]
 DEF author to book-DEF
 c. **den** forfatter [til bogen] som kom til festen
 DEF author to book-DEF who came to party-DEF
the author of the book who came to the party

So we need to show that the different structures we have proposed for the IPC and the DPC do not affect the licensing of prenominal definiteness marking by a restrictive relative clause.

In Hankamer and Mikkelsen (2005:113–116), following Bianchi (1999), we adopted a DP-raising analysis of Danish restrictive relative clauses, which we supported by language-internal evidence from reconstruction effects:



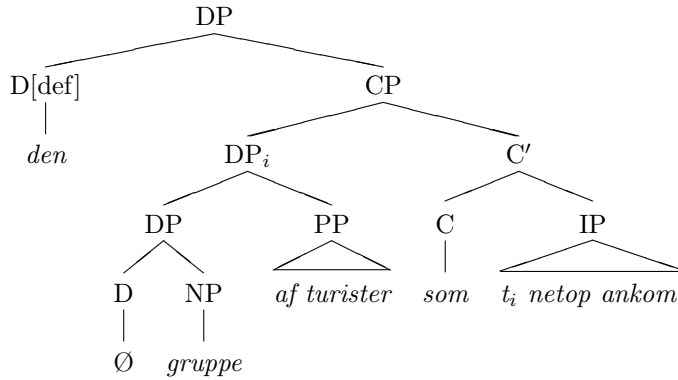
observation.

Licensing of a definite article by a restrictive relative clause is also found in various English DPs including the regular partitive construction: *the four of the boys* *(that came to dinner) (Jackendoff 1977:177ff). Barker (1998) provides a semantic account of this effect and an anonymous reviewer asks whether Barker’s account could be extended to the Danish facts discussed in this section and to similar effects in English pseudopartitives with a sufficiently abstract N1: *The number of guests* *(that came to dinner) could not be fed. While it might be possible, there are two obstacles that currently prevent us from offering such an analysis. First, Barker’s account of the ungrammaticality of definite partitives like *the four of the boys* rests on the assumption that the lower nominal (here *the boys*) must denote an individual (here the group individual consisting of the contextually relevant boys) as opposed to a generalized quantifier or a set of individuals. (This is the Partitive Constraint of Ladusaw (1982).) It is not clear that the semantics of pseudopartitives is similar in this respect. The only formal semantic analysis of pseudopartitives that we know of, that proposed by Schwarzschild (2006), does not analyze the lower nominal as individual-denoting, but rather as a predicate over individuals (see his (131) on p. 105). Second, if the licensing of a definite article by a relative clause is semantic in nature, there must be some semantic difference between the DPC and IPC, since only the former needs such licensing. We currently have no insights as to what that difference could be.

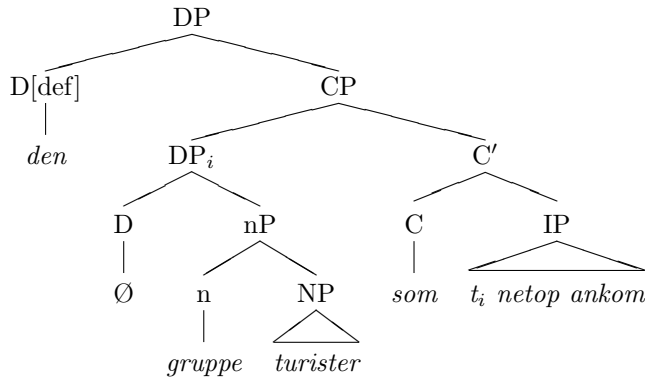
Since at spell-out D[def] is not sister of N (D[def] is the sister of CP), we get prenominal definiteness marking, the elsewhere case (see section 3.1).

If we combine this relative clause analysis with the structures we assume for the IPC and the DPC, we get the following structures for (53) and (54):

(57) IPC:



(58) DPC:

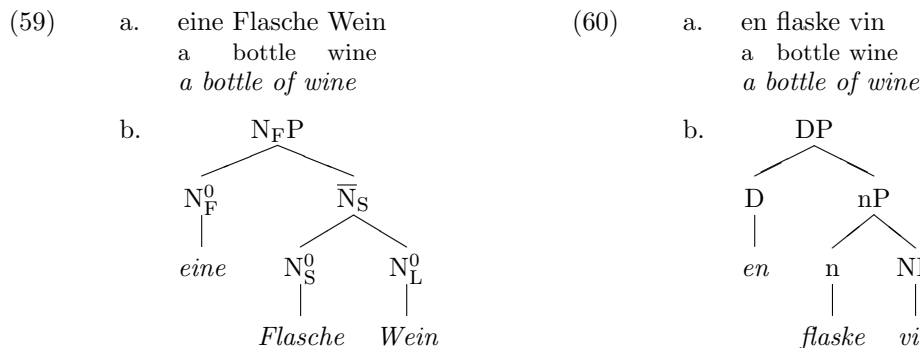


Just as in the case of an ordinary DP, both pseudopartitive constructions have structures in which D[def] is not the sister of N, and the prenominal article is the only permitted realization of it. This is the solution to the third part of the definiteness puzzle. The possibility of prenominal definiteness marking in (53) and (54) has nothing to do with the structure of the DPC and the IPC, but everything to do with the derivation of restrictive relative clauses in Danish.¹⁴

¹⁴One might reasonably ask how this analysis accounts for number and gender agreement, since the determiner exhibiting agreement (*den*) is not in the canonical structural relationship with the noun that controls agreement: in particular *gruppe* is not the head of *den*'s complement. However, as Bianchi (2000:125–128) points out, the two are in a local enough configuration for an agreement relation to be established. The inner DP containing *gruppe* is in the specifier of CP and hence accessible to elements outside the CP, including the outer D.

6.3 Pseudopartitives and extended nominal projections

Above we propose that the Danish DPC forms a single extended nominal projection in which N2 is the lexical head and N1 and D are both functional heads (following Grimshaw (1991, 2005) we would assume that D has a higher F-value than N1 since D occurs higher in the projection). In contrast, the Danish IPC contains two extended projections: one whose lexical head is N1 and one whose lexical head is N2. The latter obligatorily contains a preposition (*af* or *med*) as its highest functional head. As regards the analysis of the IPC, we find ourselves in convergence with Grimshaw’s (to appear) analysis of English IPCs like *a box of books*, *a bottle of water*, and *a plate of cookies*. Grimshaw argues that these necessarily involve two extended projections. Since English does not have a DPC, the question of whether it would involve one or two extended projections does not arise in Grimshaw’s discussion. It does arise in van Riemsdijk’s (1998:13–18) discussion of Dutch and German DPCs, and he argues that these “show the behavior of single projections rather than dual projections” (p. 13), citing evidence from semantic selection, case agreement, and the distribution of determiners between N1 and N2. However, van Riemsdijk also suggests that Dutch and German DPCs cannot straightforwardly be analyzed as a single extended projection in Grimshaw’s sense, because N1 “retains more of its independence than would be expected if it were a functional head” (p. 15). In particular, N1 of a DPC can antecede relative clauses and determine adjective order independently of N2, and it forms a semi-open class (DPCs with novel N1s can be formed).¹⁵ To accommodate these observations, van Riemsdijk proposes that a third kind of category be recognized alongside Grimshaw’s lexical and functional categories, namely semi-lexical categories, and that the N1 of a DPC is a semi-lexical head. A single projection may contain a semi-lexical head above a lexical head, but below any functional heads. Thus the German DPC in (59a) has the single projection structure in (59b), where the subscripts F, S, and L indicate functional, semi-lexical, and lexical categories, respectively (van Riemsdijk 1998:39). For comparison, we include our structure for the corresponding Danish DPC in (60).



The existence of DPCs is one of van Riemsdijk’s (1998) main empirical arguments against Grimshaw’s (1991) theory of extended projections and in favor of his own notion of (M-)projections. Grimshaw (2005:12, fn. 11) responds that she does not see the logic of this argument, and suggests that N1 and N2 of a DPC can “form part of a single extended projection provided that the measure noun [i.e. N1] has an F-value greater than that of a regular noun”. In our view this is a reasonable response to van Riemsdijk’s (1998) criticism, but we nonetheless believe that Dutch and German DPCs, as well as the Danish DPCs studied above, present a serious challenge to Grimshaw’s theory. The problem lies not with accommodating two nominals in one extended projection, but with the fact that the two nominals may differ in number and gender, as shown in (61) and (62) (see also (30) above and examples (13a,b,e), (14a), (16a), (17a), (20a,b),

¹⁵van Riemsdijk acknowledges (p. 17) that some N1s might be fully functional heads, or lead a double life as either semi-lexical or functional heads. What is important for his argument with Grimshaw is that not all occurrences of all N1s in Dutch and German DPCs can be analyzed as functional heads in Grimshaw’s sense.

(22a) in van Riemsdijk (1998)):

(61) en flok fugle
a-SG flock-SG bird-PL
a flock of birds

(62) en spand vand
a-COM bucket-COM water-NEU
a bucket of water

Such number and gender mismatches pose a problem for analyzing DPCs as single extended projections because of the consistency requirement that Grimshaw (2005) imposes on extended projections:

The extended projection analysis automatically requires “agreement” between a functional head which is specified for number and the head of its complement. For *a* and *this/these/that/those*, assuming these to be F-heads, the features projected from D to DP will include number and the features projected from N to NP to DP will also include number. A *consistency* requirement will therefore automatically exclude cases where the D and N disagree in number, allowing only combinations where both have the same value for the feature, or at least one of the two is unspecified for the feature. The functional head and the lexical head of the extended projection can never have contradictory values for projected features, because both sets of features are projected onto the same phrase.

(Grimshaw 2005:17)

Grimshaw’s (2005) motivation for imposing the consistency requirement is that it allows for an elegant and simple analysis of semantic selection and agreement between extended nominal projections and (verbal) elements outside the projections. For instance, one does not need to assume that the English definite determiner *the* is ambiguous between a singular form and a plural form. On the other hand, if we analyze Danish DPCs as extended nominal projections, they are clearly in violation of the consistency requirement. This is a dilemma because the evidence presented in sections 4.1–4.3 points strongly to Danish DPCs’ forming a single extended projection and if Grimshaw’s theory isn’t able to accommodate them as such, it is a weakness of the theory.

van Riemsdijk’s (1998) theory of (M-)projections does not have a problem with the number and gender mismatches, since no consistency requirement is assumed. On the other hand, the lack of such a consistency requirement leaves open how the English selection and agreement facts discussed by Grimshaw (2005) should be analyzed, as well as the more general question of when exactly elements of a single projection may disagree, and with respect to which features. van Riemsdijk (1998:fn. 16) acknowledges the latter issue and suggests that what is needed is a theory of feature percolation, while leaving the development of such a theory to future research. We too are not in a position to resolve this issue here, but we would like to suggest that the notion of semi-lexical category could be useful in this regard. In particular, one could hypothesize that projection-internal mismatches are allowed if a semi-lexical head is involved, but not when an extended projection contains only a lexical head and one or more functional projections. One possible test case, pointed out to us by a reviewer, is the English a-kind-of-N construction, which appears to be a single extended projection and which allows number mismatches (see corpus data in Zamparelli (1998:292)). While this hypothesis obviously needs to be tested more thoroughly, it does reconcile Grimshaw’s (2005) analysis of selection and agreement in English with van Riemsdijk’s (1998) analysis of German and Dutch DPCs and our analysis of Danish DPCs.

6.4 DEF-n puzzle

We have one remaining puzzle. While DPCs occur with prenominal definiteness marking in the context of a restrictive relative clause, the string in (63), which lacks a restrictive relative clause, can only be interpreted

as a demonstrative phrase (this is part of what we called the second puzzling fact in section 2, cf. (7) vs. (11)):

(63) den flok fugle
 DEM/*DEF flock birds
 ‘that flock of birds’

(64) *flokk-en fugle
 flock-DEF birds

This is strongly reminiscent of another fact, namely that the simple DN string (65) can also only be interpreted as a demonstrative:

(65) den fugl
 DEM/*DEF bird
 ‘that bird’

Hankamer and Mikkelsen (2002, 2005) propose that the lack of a definite interpretation of (65) is due to Poser-Blocking of D[def] N by (66):

(66) fugl-en
 bird-DEF
 ‘the bird’

However, we cannot appeal to Poser-Blocking in the case of (63), since the analogue to (66) is (64), which is ungrammatical. If only Poser-Blocking were at work, (63) should be good on the definite (non-demonstrative) interpretation.

One might be tempted to suggest that both (63) (on the definite, non-demonstrative reading) and (64) are ruled out because D[def] simply cannot take an nP complement (while D[dem] can). Such a restriction would explain the lack of a definite (non-demonstrative) reading for (63), as well as the ungrammaticality of (64). Crucially, it would not incorrectly rule out (67), since under our analysis of (67) the D[def] (=den) takes CP as its complement and the nP [*flok fugle*] is the complement of a null D. Note also that this is fully compatible with the assumption made in Hankamer and Mikkelsen (2005), as well as by Bianchi (1999), that the null D is not definite (if it were, it should not be able to combine with nP and hence there would be no derivation for (67)).

(67) den flok fugle vi så i går
 DEF flock birds we saw yesterday
 ‘the flock of birds we saw yesterday’

This will not do, however, because when n is modified by a prenominal adjective the definite interpretation is available:

(68) den store flok fugle
 DEM/DEF big flock birds
 the/that big flock of birds

According to our assumptions, adjectives are adjoined to NPs (and nPs), and the presence of an adjective should not affect selection.

It appears that what we must accept is that when a n is unmodified, it is incompatible with D[def]. Note well, this does not mean that it is incompatible with definiteness, since the D[dem] is surely definite. It is incompatible with the sort of definiteness associated with the definite determiner used anaphorically (let us

call this “anaphoric definiteness”), but not with the definiteness associated with a restrictive relative clause, or the definiteness associated with a demonstrative.

So where, for example, a situation exists or has been described in which there are two flocks of things, a flock of birds and a flock of sheep, and the birds fly away, in a language like English it is perfectly normal to say (69):

(69) The flock of birds flew away.

But in Danish, under the same circumstances, the DPC does not permit the definite article:

(70) *flokk-en fugle (fløj væk)
flock-DEF birds flew away

(71) *den flok fugle (fløj væk)
DEF flock fugle flew away

The only things you can say are

(72) fugle-flokk-en (fløj væk)
bird-flock-DEF flew away

(73) fugle-ne (fløj væk)
birds-DEF flew away

We assume that this difference between English and Danish results from the fact that English does not have a DPC (hence, *flock* in English is not a semi-lexical head), whereas in Danish there is a DPC and *flok* is a semi-lexical head when it occurs in the DPC. It appears to be a semantic property of these semi-lexical heads that they cannot participate, unless modified, in anaphoric definiteness relations.

7 Conclusion

While our focus has been on the morphosyntactic and prosodic properties of the DPC and the IPC, it is clear that there are also semantic issues that deserve investigation. First, the literature (cf. section 3.2) recognizes a range of subcategories of N1. We ignored these subcategories here, since all N1s appear to behave alike with respect to the definiteness marking puzzle that is the central concern of our paper. It seems likely, however, that a fuller understanding of pseudopartitives, especially their semantics, will require a fuller understanding of the different subcategories of N1s. We have also largely ignored the question whether there are restrictions on the determiner in the two constructions (though we touched on one specific such restriction in section 6.4 (the DEF-n puzzle)). Again we believe that the issue is bound up with the semantics of these constructions.

A second arena in which further investigation is in order concerns the differences between Danish on the one hand and Swedish and Norwegian on the other. Whereas suffixal definiteness marking on N1 is impossible in Danish DPCs, N1 may bear the definite suffix in Swedish whether the suffix is the sole exponent of definiteness or expresses agreement with a prenominal definite article (Delsing 1993:215). The latter is an example of so-called double definiteness marking which arises when an attributive adjective is present (and in various other contexts). In Norwegian DPCs, N1 can bear the definite suffix when participating in double definiteness, but not when the suffix is the sole exponent of definiteness, most notably when no adjective modifies N1 (Kinn 2001:147). These facts should presumably be related to the fact that Swedish and Norwegian permit double definiteness marking, while Danish does not.

What we believe we have shown is that in Danish, the DPC has a structure in which N1 is not an ordinary N, but rather a functional or semi-lexical category (n) which takes an NP complement, while the

IPC structure is just that of a nominal phrase, headed by an element of category N, which takes a PP complement. In conformity with earlier work (Julien 2005, Hankamer and Mikkelsen 2005), we assume that this PP occurs adjoined to DP, while the NP complement of n in the DPC never occurs in this position. These assumptions about the syntactic structures provide an explanation for the prosodic difference, the inflectional deficiency of N1 in DPCs, almost all of the definiteness marking puzzles, and the distribution of additive particles. In brief, the DPC behaves like a single extended projection of N2, while the IPC does not.

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