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En Pronominalization in French and the Structure of Nominal Expressions

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Abstract. In this paper, I tackle the question of the syntactic source of the clitic *en* in French, debated in the literature since the late 1970s (Kayne 1977 and Milner 1978). The aim is not only to find out what *en* pronominalizes but also to provide an analysis of nominal expressions able to account for (i) the quantitative, partitive, and genitive examples discussed by Milner (1978) and for (ii) the fact that *du/des* NPs can be replaced by *en* in some contexts only.
What I suggest to account for the issues raised by *en* pronominalization is that quantitative nominals and *du/des* NPs have a unified structure that takes notions like number, quantity, and count/mass into account and that *du/des* NPs belong to different categories—that is, that their left periphery is composed differently. The idea is that, in addition to PPs, *en* can replace different layers of a nominal structure with an articulated left periphery and a fine-grained inflectional domain, in a cartographic spirit. The property underlying all uses of *en* could be their lack of referentiality, as observed by Gross (1973) for quantitative *en*.

1. Introduction

1.1 Aim and Scope of the Paper

This paper examines constructions like (1)–(4) involving the clitic pronoun *en* in French and aims at finding out what exactly *en* pronominalizes—that is, the category and the internal structure of the constituent replaced by *en*. A broader objective is to determine what the study of *en* teaches us about the structure of nominal expressions.

(1) a. Jean se   souvient   **de tous ses étudiants.**
      Jean REFL remembers of all   his students
      'Jean remembers all of his students.'
   b. Jean s'   **en** souvient.
      Jean REFL *EN* remembers

(2) a. Jean a   acheté trois **de mes peintures.**
      Jean has bought three of my   paintings
      'Jean bought three of my paintings.'
   b. Jean **en** a   acheté trois.
      Jean *EN* has bought three

(3) a. J'ai   lu   beaucoup/peu **de livres.**
      I have read many/few   of books
      'I have read many/few books.'

   b. **J'en** ai   lu   beaucoup/peu.
      I *EN* have read many/few

(4) a. Marie cherche   **des souris/du sel**.
       Marie is.looking.for of.the mice/of.the salt
       'Marie is looking for mice/salt.'
    b. Marie **en** cherche.
       Marie *EN* is.looking.for

The paper is organized as follows. The next subsection presents the puzzle to be addressed. More precisely, it introduces data that are problematic for an analysis that would consider the constituents replaced by *en* as uniform. Section 2 reports different aspects of three papers dealing with *en*, starting with two important studies from the 1970s and moving on to more recent work. The framework adopted here is presented in section 3, and the analysis I propose in section 4. Section 4.1 deals with *en* and various issues related to *du*/*des* NPs, such as the structure of their left periphery and the potential scope properties of *des* NPs. Section 4.2 discusses *en* in quantitative examples and the structure of these constituents, in particular their inflectional domain. Section 4.3 examines genitive and partitive *en*. Section 5 concludes the paper.

1.2 The Puzzle

A quick look at the above examples might lead us to a first hypothesis concerning the pronoun *en*: assuming that *du*/*des* in (4) is formed with *de* 'of' and *le*/*les* 'the', we could propose that *en* replaces the *de* constituents in bold in (1)–(4), and more generally that it may pronominalize any *de* constituent. However, this would be too simple a conclusion for at least three reasons.

   The first reason is that the data in (1)–(4) are not homogeneous, a fact that has to be taken into account. For instance, the strings replaced by *en* in (1) and (2) contain a determiner, in contrast with the one in (3). Although examples like *beaucoup/peu de ces livres* 'many/few of these books' are possible in French, they have a partitive interpretation like (2). Example (3), in contrast, does not involve a part–whole relation. That partitive examples like (2) structurally differ from quantitative ones like (3) is clearly shown by Milner (1978:chap. 2; see also sect. 2.2 of this paper). Furthermore, in (1) and (4), *en* stands for the whole complement of the verb, whereas in (2) and (3) it represents only part of it. That (4) is not a quantitative structure like (3), with an empty quantity, is shown in section 4.2.2.

   The second reason to reject such a hypothesis is that the study of additional data shows that *en* may also pronominalize constituents that do not comprise *de*, as in (5). Finally, the most intriguing reason, in my opinion, is that some *de*-containing NPs, in particular some *du*/*des* NPs, cannot be replaced by *en*, as illustrated in (6).

(5) a. J'ai   lu   **deux/plusieurs livres.**
       I have read two/several   books
       'I have read two/several books.'
    b. J'**en** ai   lu   deux/plusieurs.
       I *EN* have read two/several

(6) *Speaker A*:
    a. J'ai vu   **des   enfants** dans la   cour. C'était Pierre, Paul et
       I have seen of.the kids   in   the   yard it was Pierre Paul and
       Jacques.
       Jacques
       'I saw some children in the yard, namely Pierre, Paul, and Jacques.'
    Speaker B:
    b. *Oui, j' **en** ai   vus   aussi.
        yes I *EN* have seen   too
    c. Oui, je **les**   ai   vus   aussi.
       yes I them   have seen   too
       'I've seen them, too.'

In (5), *en* pronominalizes *deux livres* and *plusieurs livres*, which do not involve *de*. In (6), *des enfants* cannot be replaced by *en* as the ungrammaticality of (6b) shows; the pronoun *les* has to be used, as in (6c). Although examples like (5) have been addressed in the literature (Kayne 1977, Milner 1978; also see sect. 2.1), the difference between (4) and (6) has, to my knowledge, not been noticed, much less accounted for. The study of such data will lead me to propose an analysis in which *en* may replace different syntactic categories, including distinct layers of the nominal structure, and to extend Gross's (1973) observation that quantitative *en* cannot involve reference to all uses of *en* (see sect. 4). Before turning to the reasoning leading to such a conclusion, I will provide some background on *en*, mentioning three papers discussing this element.

2. Background

2.1 Kayne 1977

In his discussion of *en*, Kayne (1977) mentions several properties of this pronoun. One is that *en* does not carry any agreement features (7): whether the noun in the constituent it replaces is feminine or masculine or whether it is singular or plural, *en* has the same morphological form ((7)–(9), adapted from Kayne 1977:111).

(7) a. Il a   déjà   parlé **de sa maison/de son travail/de ses problèmes.**
       he has already talked of his house.FEM/of his job.MASC/of his problems.PL
    b. Il **en** a   déjà   parlé.
       He *EN* has already talked

Another characteristic of *en* is that it may function as the complement of an adjective (8) or of a noun (9).

(8) a. Il   est drôlement fier   **de son idée.**
      he is   terribly   proud of his idea
   b. Il **en** est drôlement fier.
      he *EN* is   terribly   proud

(9) a. Il   va   repeindre les portes **de cette maison.**
      he is.going to.repaint the doors of this   house
   b. Il   va   **en** repeindre les portes.
      he is.going *EN* to.repaint the doors

To account for these facts, Kayne proposes that *en* is a pro-PP introduced by the preposition *de* (1977:108ff., 129). In other words, the *de* constituents replaced by *en* are prepositional phrases headed by the preposition *de*. This analysis seems rather straightforward for examples like (7)–(9), because *parler* 'speak' and *fier* 'proud' select a PP complement (*parler de*, *fier de*) and because *de cette maison* 'of this house' is the complement of a noun. However, the proposal is not obvious for (5), which does not include *de*. To solve this problem, Kayne suggests (1977:112–113; see also Gross 1967, Milner 1978:29) that at some level of representation *deux livres* and *plusieurs livres* in (5a) contain *de*, as reported in (10). In that way, (5a) is analogous to (3a), which involves *beaucoup de/peu de* 'a lot of/few of'. To support his analysis, Kayne provides examples like (11) and (12).

(10) a. deux **de livres**
      two   of books
   b. plusieurs **de livres**
      several   of books

(11) … ça fait   **deux de bonnets** que je perds.
     … it makes two of hats   that I lose
                           (Bauche 1951:79–80, cited in Kayne 1977:112 fn.)

(12) **J'en** ai   lu   deux/plusieurs, **de livres.**
     I *EN* have read two/several   *DE* books

Example (11) shows that in some varieties of French, particularly in informal registers, *de* is overt with numerals. The fact that examples like (11) are grammatical suggests that *de* co-occurs with quantities like *deux* 'two' or *plusieurs* 'several' overtly or at a more abstract level of representation. In (12), *de* occurs in an extraposed constituent. *De* in the above examples is considered by Kayne as a preposition.

As for so-called partitive constructions, which are in fact *du/des* NPs not necessarily interpreted as partitive, Kayne suggests (1977:120–123) that they also comprise a *de* PP, on a par with constructions involving numerals. Consider (13).

(13) a. [NP une [PP de fleur]]
           one   of flower
      b. [NP des   [PP de fleurs]]
           of.the   of flowers

The *du/des* NP represented in (13) is an NP containing a PP. To account for the fact that in French we usually have *une fleur* 'one flower' and *des fleurs* 'some flowers', Kayne postulates (1977:121) a rule that erases *de* 'of'. In the same vein, he assumes that there is a rule that deletes *des* in *en* constructions like (14).

(14) a. Elle a   [une de fleur]. → Elle a   [une en]. → Elle en a   une.
           she has one of flower   she has one *EN*   she *EN* has one
      b. Elle a   [des   de fleurs]. → Elle a   [des   en]. → Elle en a
           she has of.the of flowers   she has of.the *EN*   she *EN* has
          des. → Elle en a.
          of.the   she *EN* has

In (14a), the complement of *have* has the structure reported in (13). *En* replaces *de fleur* and moves out of the NP. In (14b), the analysis is the same except that *des* has to be deleted as *Elle en a des* is ungrammatical in French.
    In Kayne's analysis, *du/des* NPs can also be PPs in contexts requiring a *de* PP:

(15) a. Elle a   parlé des   photos (de Paris).
           She has talked of.the pictures of Paris
      b. parler [PP des photos de Paris] → [PP de [NP les photos de Paris]]

In other words, Kayne makes a distinction between *du/des* constituents that are NPs, as in (13b)/(14b), and those that are PPs, as in (15). This is due to selectional issues, given that *manger* 'eat' takes an NP complement whereas *parler* 'speak' selects a PP. This categorial difference has no impact on the nature of the constituents replaced by *en*: in all cases it is a PP. Kayne's analysis is therefore uniform and simple. However, it is not without problems.
    The first issue that needs to be addressed if the account presented in this section is correct is the contrast between (4) and (6): in the latter, the complement cannot be replaced by *en*, as the ungrammaticality of (6b) shows. Yet *voir* 'see' selects an NP complement with the structure advocated in (13). In other words, we expect *en* to be able to replace the PP inside NP, contrary to fact.
    Furthermore, it is generally admitted that extraction of a PP out of another PP is impossible (see, e.g., Kayne 1977:122–123). This is illustrated in (16).

(16) a. *Elle en a   parlé des   photos (de Paris).
         She *EN* has talked of.the pictures of Paris
     b. parler [PP des photos [PP de Paris]] → [PP de [NP les photos [PP de Paris]]]

In (16), *en*, which replaces the PP *de Paris*, cannot be extracted from the PP *des photos de Paris* 'of the pictures of Paris'. If this is correct, a structure like (13) seems problematic because it predicts that the complement of a noun, when it is a PP, cannot be extracted from the nominal structure. The reason is that this PP complement would have to cross another PP (*de fleur*[*s*] in (13)). However, extraction of a PP from a *du/des* NP does not necessarily lead to ungrammaticality, as (17) shows.

(17) a. Elle en a   acheté des   photos (de Paris).
         She *EN* has bought of.the pictures of   Paris
     b. acheter [NP des photos [PP de Paris]]

In (17), *en*, which replaces the PP *de Paris*, can move out of the NP *des photos de Paris* 'some pictures of Paris'. This is not expected if this constituent has the structure in (13).

Finally, another puzzling element in (13b) is the position and the nature of *des*. If *des* is a complex determiner, as often assumed (Gross 1967, Kayne 1977), it should be discussed.
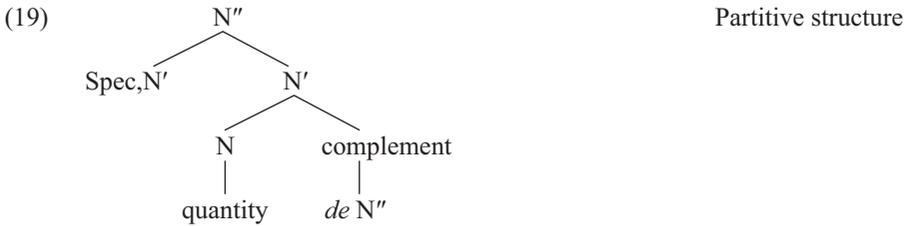
2.2 Milner 1978

To my knowledge, Milner (1978) is the first to classify *en* constructions into three groups: genitive (see (1)), partitive (see (2)), and quantitative (see (3) and (5)). His analysis of *en* constructions is part of a broader study of quantitative expressions, to which I cannot do justice here.

Milner uses *en* pronominalization to argue that the structure of quantitative expressions differs from that of partitive examples.[1] The main distinction is that the former represent a unique NP, whereas the latter should be analyzed as two NPs (Milner 1978:119; see also Jackendoff 1977). This is illustrated in (18) and (19), respectively (Milner 1978:48; translation added).

(18)   N″   Quantitative structure

          Spec,N′   N′

           quantity   *de* N   complement

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[1] Milner (1978) and Kupferman (1979) argue that quantitative and partitive noun phrases have different structures (see also Roodenburg 2004), contrary to Zribi-Hertz (2003), for example, who defends a unitary structure.

(19)   N″   Partitive structure

         Spec,N′   N′

                    N   complement

                    | |

                 quantity   *de* N″

In (18), *en* replaces N′—that is, *de N* and the potential complement of the noun—whereas in (19) it pronominalizes *de* N″, where *de* is a regular preposition (as in genitive constructions). Put differently, Milner does not associate *en* to a single structure or a single category but to two (N′ or *de* N″). This is the line of analysis I will explore here.

   One argument supporting the idea that partitive and quantitative constituents represent different categories comes from coordination. Consider the following examples (Milner 1978:71ff.):

(20) a. J' ai   reçu   beaucoup **de mes voisins   et   de mes amis.**
           I have entertained many   of   my   neighbors and of my   friends
     b. J'ai   reçu   beaucoup **de voisins   et   d' amis.**
        I have entertained many   of neighbors and of friends

(21) *J' ai   reçu   beaucoup **de mes voisins   et   d' amis.**
        I have entertained many   of my   neighbors and of friends

In (21), *de mes voisins* 'of my neighbors' and *d'amis* 'of friends' can clearly not be coordinated, in contrast to *de mes voisins* 'of my neighbors' and *de mes amis* 'of my friends' in (20a) and to *de voisins* 'of neighbors' and *d'amis* 'of friends' in (20b). Because two constituents have to be of the same category to be coordinated, these facts strongly suggest that *de mes voisins* 'of my neighbors', which is partitive, and *d'amis* 'of friends', which is quantitative, belong to different categories. In the same vein, Kupferman (1979) suggests that the former is a PP and the latter an NP, in the sense of topmost projection of the nominal structure.[2] Further evidence showing that partitive and quantitative constituents differ structurally comes from extraction facts. Some relevant examples are reported and discussed in section 4.2.1.

   Milner's work needs to be updated into a more recent framework. In particular, we would like to know what *de* in (18) is and what position it occupies. Furthermore, examples like (4) are not dealt with by Milner, given that they do not belong to the quantitative constructions he focuses on. A thorough analysis of *en* will not only have to consider such constructions but will also need to explain the contrast between (4) and (6).

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[2] The label used by Kupferman (1979) is GN for *groupe nominal* (i.e., noun phrase).

2.3 Cardinaletti & Giusti 2006

Cardinaletti & Giusti's (2006) work concerns what they call quantified structures and quantitative clitics. The analysis, based on previous work of theirs, suggests that quantitative elements[3] like *many* in *many boys of those…* are dyadic in that they select a quantitative indefinite DP (*boys*) and a partitive PP (*of those…*). The idea is that the latter represents the set out of which the quantifier picks up a subset, its restriction (*boys*). The structure advocated is as follows:[4]

(22)

```
                    QP
                  /    \
              Spec      Q'
                       /   \
                     Q'     PP
                    /  \   /  \
                   Q   DP P   DP
                   |   △  |   △
                 many boys of  those…
```
(Cardinaletti & Giusti 2006:(55))
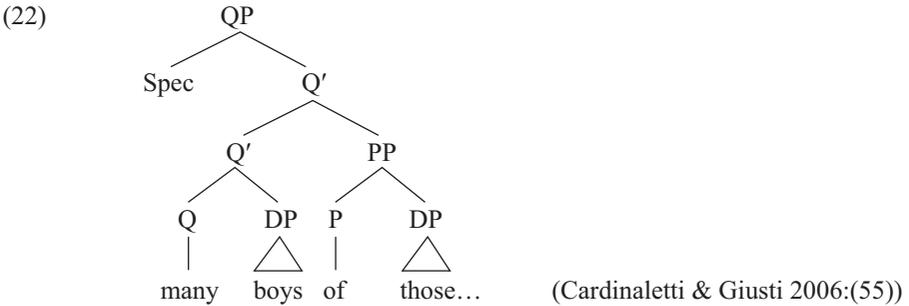
The structure in (22) builds on the assumption that elements like *many* head a QP projection outside DP, as first proposed by Sportiche (1988), although his primary interest was not the structure of nominal expressions. As for quantitative clitics, Cardinaletti & Giusti propose that they replace the quantitative DP—that is, *boys* in (22).

   Although Cardinaletti & Giusti's analysis is very attractive, and their discussion comparative, some issues need to be worked out in more detail. The issue of interest here is the internal structure of the quantitative DP in (22), especially in French because the quantitative DP contains *de* 'of', which contrasts with English:

(23) beaucoup de garçons de ceux…
      many   of boys   of those…

If *de garçons* in (23) is a quantitative DP, the status of *de* and the nature of the noun following it remain unclear (e.g., definite or indefinite), even if *de* is treated as a realization of Case by Cardinaletti & Giusti (2006:63). Given that there is no consensus on *de* in the literature (see Kupferman 2001), its precise position in the syntactic structure has to be identified. This is what I attempt to do in section 4.

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[3] These elements, called existential quantifiers by the authors, also include *few, some*, and cardinals.
[4] Cardinaletti & Giusti (2006:60) adapt this structure to make it compatible with Kayne's (1994) anti-symmetry hypothesis and Chomsky's (1995) bare-phrase-structure hypothesis. For ease of representation, I will stick to the structure reported in the text.

3. Framework

A first position I adopt is that the noun phrase, like the clause, can be divided into three domains, which may each comprise several discrete projections, in line with the cartographic approach to syntactic structures (Cinque 2002, Belletti 2004, Rizzi 2004).

(24)   a.   [DP... [DP   [FPadj1... [FPadj2... [nP... [NP...]]]]]]

     b.   [CP... [CP   [FPadv1... [FPadv2... [vP... [VP...]]]]]]

         left periphery inflectional domain NP/VP shells

(Laenzlinger 2005, with a different terminology)

The NP/VP shells represent the thematic domain—that is, the domain where the arguments of the noun or of the verb are merged (Larson 1988, Chomsky 1995, Grimshaw 1990, Valois 1991). The inflectional domain is the domain where ϕ-features and agreement are checked. It also hosts modifiers, such as adverbs in the clause and adjectives in the noun phrase. Finally, the left periphery subsumes notions like focus and topic. In the nominal structure, it is often associated to features related to the D head such as referentiality and (in)definiteness (see Rizzi 1997 for the clause and Aboh 2003 for nominals, to mention but two references). The tripartite conception represented in (24) is analogous to the one found in Platzack 2001 and Grohmann 2003 for the clause as well as Grohmann & Haegeman 2003 and Haegeman 2004 for the nominal structure. As a result of (24), the structures get more and more complex as each feature is encoded in a different layer.

    Furthermore, I assume that *des* NPs (not *du* NPs, which are mass) can be referential (Kleiber 1981b, Bosveld–de Smet 1998, Dobrovie-Sorin & Beyssade 2004, Ihsane 2008). The relevant examples may involve specifying relative sentences or adverbials as in (25) or (26).

(25)   Des   amis   que   j'   ai   rencontrés hier   m'ont   insulté.
      of.the   friends   whom   I   have   met   yesterday   me have   offended
              (Bosveld–de Smet 1998:(67a) on p. 33)

(26) J'   ai   acheté   des   livres. Il s'   agit   de *Hamlet*, *Moby Dick*
    I   have   bought   of.the   books   it SE   is.about   of *Hamlet*   *Moby Dick*
    et   *Sula*.
    and   *Sula*
    'I bought some books, namely *Hamlet*, *Moby Dick*, and *Sula*.'

In (25) and (26), the friends and the books are respectively identified by a relative clause and by another identificational means such as *il s'agit de…* 'to be about'. Elements like *notamment* 'namely' or *en particulier* 'in particular' represent other identificational possibilities. An important characteristic of these referential indefinites is that their interpretation depends on the speaker. *Referential* is thus used

here in the sense of a speaker's reference, in Kripke's (1977) terms (see also Farkas 1997). "The speaker's referent is that individual which the speaker "wishes to talk about" (or "has in mind") on the occasion of the utterance" (Heim 1982:15).[5] Referential indefinites thus contrast with nominals with a rigid reference, typically *the* NPs as in *John found the dog (i.e., Rex).*

Finally, I consider that arguments and properties represent different syntactic categories. In the syntactic tradition, properties are NPs and arguments DPs, the intuition being that to be arguments nouns somehow need a determiner (Szabolcsi 1987; Abney 1987; Longobardi 1994, 2005). One way of formulating the distinction is reported in (27).

(27) A "nominal expression" is an argument only if it is introduced by a category D.
                                                        (Longobardi 1994:(21))

How (27) can be related to (24a), where DP is not a single layer but a domain, will be addressed in section 4.1.

Keeping these considerations in mind, let us turn to the analysis (see Ihsane 2008 for further motivations and consequences), starting with the study of *du/des* NPs that cannot always be pronominalized by *en*.

4. The Analysis

4.1 Du/des *NPs and the Left Periphery*

4.1.1 *The interpretation*
This section concentrates on *du/des* NPs, which are particularly interesting because they can only be replaced by *en* in some contexts, as illustrated by the contrast between (4) and (6) repeated here as (28) and (29).

(28) a. Marie cherche   **des   souris/du sel.**
          Marie is.looking.for of.the mice/of.the salt
          'Marie is looking for mice/salt.'
      b. Marie **en** cherche.
          Marie *EN* is.looking.for

(29) *Speaker A*:
      a. J'ai vu   **des   enfants** dans la   cour. C'était Pierre, Paul et
          I have seen of.the kids   in   the yard it was Pierre Paul and
          Jacques.
          Jacques
          'I saw some children in the yard, namely Pierre, Paul, and Jacques.'

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[5] In other contexts, the reference of indefinites depends on a universal quantifier (covariation). An example would be *Every professor dances with a student*, with the meaning that each professor danced with a different student who can be identified.

Speaker B:
b. *Oui, j' **en** ai   vus   aussi.
    yes   I   *EN* have seen too
c. Oui, je **les** ai   vus   aussi.
    yes   I   them have seen too
    'I've seen them, too.'

One way to approach the fact that *en* is grammatical in (28b) but not in (29b) is to hypothesize that the *du/des* NPs in these examples belong to different categories and that *en* can only replace one of these categories.[6] This is the line of analysis developed in this section, which is based on the assumptions that predicates are structurally less complex than arguments and that referentiality is encoded in the left periphery (see sect. 3).

If the *du/des* NPs illustrated in (28) and (29) belong to different categories, several issues have to be addressed—in particular, the two listed here:

- What is their syntactic category?
- If these nominals represent different layers, is there some kind of hierarchy between these projections or are they in complementary distribution?

To answer the first question, we need to determine what distinguishes *des souris/du sel* 'mice/salt' in (28) from *des enfants* 'some children' in (29). A clue to the position I argue for here comes from the presence of *c'était…* 'it was…' in (29a), which is synonymous to *il s'agissait de* 'namely'. Recall from the preceding section that such elements allow us to identify the entities referred to. Put differently, we are dealing with a referential *des* NP. Crucially, this is not the case of the *du/des* NPs in (28), which is not about some mice or salt in particular. In other words, what differentiates the *du/des* NPs in these data is referentiality: in (28) *des souris/du sel* is not referential, in contrast with *des enfants* in (29). In the structure, notions like referentiality are traditionally related to the D head (see, e.g., Longobardi 1994, Zamparelli 2000). The adoption of (24), where D represents a domain of projections, means that reference is encoded in the nominal left periphery. Given that the interpretation of referential *des* NPs generally depends on who or what the speaker has in mind, I label these nominals speaker's reference phrases (SRefP). In sum, the idea is that the dependent reference of *des* NPs is encoded in a projection of the nominal left periphery called SRefP.

As for the *du/des* NPs in (28), what characterizes them has to be determined. One possibility would be to consider their lack of reference as the most prominent feature of their interpretation; that is, there could be a feature [±(speaker's) reference] that could be set positively or not. However, this is problematic if we consider examples like (30).

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[6] An anonymous reviewer observes that another possibility would be to consider type-shifting to account for these facts: *en* cliticization would be grammatical only with indefinites governed by the verb. This would be the case of (28) but not of (29) because the *du/des* NP in this example would have scrambled out of its base position to some higher slot, not accessible to *en* cliticization. The impact of such a proposal on the rest of the analysis presented here would have to be investigated.

(30) a. Des licornes sont blanches et d'autres noires.
　　　 of.the unicorns are white and others black　　(Kleiber 1981a)
　　b. Des enfants ont faim, tandis que d'autres ont soif.
　　　 of.the children are hungry while others are thirsty
　　　　　　　　　　　　　　　　　　　　　　　(Bosveld–de Smet 1998:15)

The reason is that the *du/des* NPs in (30) are not referential but still differ from those in (28) in that they are quantificational. This means that these noun phrases cannot be pointed at and crucially that they involve a contextually determined set and presuppose existence. In contrast, *des souris/du sel* in (28) do not involve a contextually determined set and may assert existence (a characteristic depending on the predicate; see Van Geenhoven & McNally 2005).

The above discussion suggests that *du/des* NPs can be classified into three groups (Dobrovie-Sorin & Beyssade 2004, Ihsane 2008). This means that referentiality cannot be a binary notion represented by a feature [+referential] versus [−referential]. Consequently, the fact that the *du/des* NPs in (28) are not referential is not sufficient to characterize them. What I use here is the fact that these constituents are arguments interpreted as properties, in opposition to predicates that are interpreted as properties. The fact that argumental indefinites can be properties has been proposed by Higginbotham (1985), but this approach has only been developed in the 1990s (McNally 1995, Van Geenhoven 1996, Dobrovie-Sorin 1996). Nominals with the indefinite article *a/un* may typically represent both categories, as in *I'm looking for a dog*, when the complement of the verb, *a dog*, means any dog and not a dog in particular, and in *Rex is a dog* where *a dog* is a predicate. Given that the pronoun *en* is only possible in contexts involving *de*, examples with *du/des* instead of *un(e)/a* are more appropriate to illustrate the point:

(31) a. Marie et Susanne sont *des athlètes*.　　　　　　　　Predicate
　　　 Marie and Susanne are of.the athletes
　　b. Je cherche *des athlètes* (n'importe lesquels).　　　Argument
　　　 I am.looking.for of.the athletes (any athletes)

In (31a) *des athlètes* is a predicate whereas in (31b) it is an argument, interpreted as a property, a reading favored in intensional contexts like *chercher* 'look for'.

4.1.2 *The structure*
Given that *des athlètes* in (31a,b) have different functions (predicate vs. argument), they must also have different structures, as specified in (27) (*A "nominal expression" is an argument only if it is introduced by a category D*). More precisely, *des athlètes* is introduced by a category D when it is an argument (31b) but not when it is a predicate (31a). Crucially, this does not only imply that *des athlètes* in (31a) and *des athlètes* in (31b) represent different syntactic categories. It also means that property-denoting arguments are structurally more complex than predicates as schematized in (32).

(32)   Argument$_{property}$ > Predicate$_{property}$

More precisely, (24) and (27) suggest that the structure of predicates like *des athlètes* in (31a) comprises the NP shells and the inflectional domain. If the layer selected by D (i.e., by the lowest projection of the D domain in this framework) is a number phrase (NumP; Ritter 1991), it means that this is the category of the predicates examined here. In other words, we consider that NumP is the highest layer of the inflectional domain and hence the category of predicates like *des athlètes* in (31a). As for *des athlètes* in (31b), I will label such nominals as property phrases (PropP) to highlight their interpretation as properties in opposition to other *du/des* arguments. Example (32) can hence be reformulated as (33).

(33)   **PropP** >   NumP…   > NP
       left periphery inflectional domain

If *des athlètes* in (31b) has the structure proposed in (33), a question arises regarding how to relate this to the idea that referential *du/des* NPs are SrefP, as suggested earlier. SRefPs are also arguments, so this layer has to be part of the nominal left periphery, which leads us to the second issue—namely whether PropP and SRefP are in complementary distribution. In other words, is the structure of SRefPs as in (34) or do PropP and SRefP co-occur in the structure?

(34)   **SRefP** >   NumP…   > NP
       left periphery inflectional domain

To answer this question, let us consider intervention effects. The general principle is reported in (35), where α and β represent semantic features.

(35)   a. $*\alpha_i…\alpha_j…\alpha_i$
       b. $*\alpha\beta_i…\alpha\beta_j…\alpha\beta_i$
       c. $*\alpha…\alpha\beta…\alpha$
       d. $\alpha\beta…\alpha…\alpha\beta$ (Starke 2001)

Example (35) formalizes the observation that an element can bypass another one only if it is semantically heavier, as in (35d). Consider (36), which illustrates the interaction between referential *des* NPs and universal quantifiers—that is, prototypical quantifier phrases (QPs).

(36) a. Tous les étudiants ont   lu   des   livres, soit   *Hamlet*,
          all   the students   have read of.the books   that.is.to.say *Hamlet*
          Sula et   *Quartet*.
          Sula and *Quartet*   (des_{SRef} > ∀); *(∀ > des_{SRef})

   b. Des   hommes que je connais bien ont   impressionné tous les
      of.the men   that I   know   well have impressed   all   the
      étudiants.
      students
      Il s'agit   du   doyen et   du   recteur.
      it is.about of.the dean   and of.the rector

$$(des_{\text{SRef}} > \forall); *(\forall > des_{\text{SRef}})$$

In (36a), *des livres*, interpreted as some books in particular, takes scope over *tous les étudiants*. As the judgments in parentheses show, the reverse is impossible.[7] In (36b), too, it is the referential indefinite that takes scope over the universal quantifier. Put differently, at some level of representation, referential indefinites may bypass universal quantifiers, as in (36a), whereas universal quantifiers may not move past referential indefinites, as in (36b). If we apply (35) to (36), it is possible to conclude that S(peaker)-referential indefinites are semantically heavier than quantifiers. In a cartographic spirit where a projection encodes a single feature, this indicates that the structure of the former is more complex than the one of the latter. In other words, the structure of *des livres* in (36a), interpreted as some books in particular, is more complex than the one of *tous les étudiants*, and the structure of *des hommes* in (36b), interpreted as some men in particular, is more complex than the one of *tous les étudiants*. More generally, we conclude that universal quantifiers are structurally smaller than referential *des* NPs.

   These facts suggest that referential *des* NPs have scope properties—that is, they seem to undergo quantifier raising (QR) at Logical Form (LF). How this is possible is discussed in the next section. But to understand the reasoning underlying the analysis, let us examine the interaction between QPs and property-denoting arguments (PropPs). The relevant interpretation of (37a) here is the one where the cellists are any cellists, not particular ones nor cellists from a previously mentioned set of cellists or musicians. Example (37b) is about any suites.

(37) a. [$_{\text{PropP}}$ Des   violoncellistes] ont   joué   [$_{\text{QP}}$ toutes les suites].
          of.the cellists   have played   all   the suites

$$(\forall > des_{\text{Prop}}); *(des_{\text{Prop}} > \forall)$$

   b. [$_{\text{QP}}$ Tous les musiciens] ont   joué [$_{\text{PropP}}$ des suites].
          all   the musicians have played   of.the suites

$$(\forall > des_{\text{Prop}}); *(des_{\text{Prop}} > \forall)$$

Example (37) shows that the universal quantifier must take scope over the property-denoting constituent. When *des violoncellistes* in (37a) has the interpretation specified above, *toutes les suites* takes scope over it. In other words, *toutes les suites* bypasses *des violoncellistes*. If we apply to this example the same reasoning as for (36), it means that the QP *toutes les suites* is semantically heavier and hence structurally

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   [7] When *des livres* does not refer to some books in particular, the scope properties are naturally different: the universal quantifier takes scope over the *du/des* NP.

more complex than the PropP, *des violoncellistes*. By transitivity, it implies that S-referential arguments are semantically heavier than property-denoting ones, and hence also structurally more complex. Confirmation that this is on the right track is provided by (38).

(38) a. [$_{PropP}$ Des étudiants] ont volé [$_{SRefP}$ des   livres: *Sula* et   *Hamlet*].
          Students   have stolen   some books *Sula* and *Hamlet*
                                    ($des_{SRef} > des_{Prop}$); *($des_{Prop} > des_{SRef}$)

   b. [$_{SRefP}$ Des   étudiantes,   plus   précisément Anne et   Marie],
          some students.FEM more precisely   Anne and Marie
       cherchent   [$_{PropP}$ des   livres].
       are.looking.for   of.the books
       'Some students, namely Ann and Mary, are looking for books' (i.e., any
       books).   ($des_{SRef} > des_{Prop}$); *($des_{Prop} > des_{SRef}$)

In (38a), *des livres*, which represents two books in particular, takes scope over *des étudiants*, interpreted as students that cannot be identified. In (38b), the property-denoting *des livres,* interpreted as any books, cannot bypass *des étudiantes*, which is referential, suggesting that the former is not semantically heavier than the latter.[8]

  The list in (39) summarizes the above discussion in terms of syntactic categories.

(39) a. SRefP QP   <SRefP>   (36s)
   b. *QP   SRefP <QP>   (36n)
   c. QP   PropP <QP>   (37s)
   d. *PropP QP   <PropP>   (37b)
   e. SRefP PropP <SRefP>   (38s)
   f. *PropP SRefP <PropP>   (38b)

According to (39e,f), the structure of SRefPs comprises more layers than the one of PropPs, the two categories of interest in this paper. Otherwise, SRefPs could not bypass PropPs. Given that both categories are arguments, it suggests that the left periphery of the former is more complex than the one of the latter. This is illustrated in (40), where the two layers, SRefP and PropP, co-occur in the structure.

(40) **SrefP**... **> PropP** > NumP...   > NP
     left periphery   inflectional domain

Informally, (40) expresses that PropP turns a predicate into an argument and that SRefP transforms this argument into a particular kind—namely, a referential indefinite. As a result, *des souris/du sel* in (4a)/(28a) and *des enfants* in (6a)/(29a) have the following structures, respectively:

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[8] PropPs probably do not have scope properties, on a par with bare nouns (McNally 1995). For reasons of space, I will not go into this here.

(41) a. des souris (any mice)/du sel: PropP > NumP … > NP
      b. des enfants (some children in particular): SrefP… >
                                                        PropP > NumP… > NP

The hypothesis that *du/des* NPs functioning as arguments represent different syntactic categories organized hierarchically as proposed in (40) and (41) is an important outcome for the study of nominal structures. Interestingly, this analysis of *du/des* NPs allows us to account for the contrast between (4)/(28) and (6)/(29) quite straightforwardly: because *en* can replace *des souris/du sel* in the former but not *des enfants* in the latter, I conclude that this clitic can pronominalize PropPs but not SRefPs. To account for this contrast, I suggest that Gross's (1973) observation that quantitative *en* cannot involve reference should be extended to all uses of *en*. In other words, *en* in (6)/(29) cannot replace *des enfants* because this constituent is referential.

4.1.3 *Quantifier Raising and Logical Form*

As observed in the preceding section, (39) does not only imply that SRefPs are structurally more complex than PropPs. It also means that SRefPs are bigger than QPs. This is what (39a,b) formalizes, on the basis of examples like (36): SRefPs must be semantically heavier than QPs to bypass them, and therefore also syntactically more complex. Although this observation is not directly related to this discussion of *en*-pronominalization, it is important because it will allow us to explain why SRefPs, which denote individuals, can bypass other constituents, in particular quantifiers, as in (36).

   If my analysis is on the right track—that is, if SRefPs comprise the PropP layer as in (40) and (41)—they should also have the QP layer in their structure (cf. (39a,b)). This is illustrated in (42).

(42) **SRefP   > QP > PropP** > NumP…   > NP
      left periphery   inflectional domain

Although the co-occurrence, in the same structure, of a layer related to referentiality and of another one related to quantification seems counterintuitive, it is precisely what allows us to account for the characteristics of SrefPs—namely, their S-referential interpretation and their scope properties. Indeed, the idea underlying (42) is that the projection of the SRefP layer leads to an S-referential reading—the quantificational interpretation gets lost—and that the presence of the QP layer triggers QR. Put differently, it is the QP layer in (42) that renders S-referential *des* NPs visible to QR. If this is correct, it would not be the quantificational interpretation of a constituent that leads to QR, but the presence of the QP layer in its structure. Informally, the QR operation would recognize the constituents to be moved because they are composed of a QP layer. As QR is a syntactic mechanism, after all, it would not be surprising that it is sensitive to syntactic characteristics.

   If S-referential *des* NPs undergo QR, it means that the highest layer of their left periphery (SRefP) is moved along with the QP. In other words, SRefP is pied-piped

with the QP. That extra material can be displaced with the QP is attested in different contexts (Michal Starke, p.c.). This is illustrated in the following example of pied-piping in French:

(43) a. Pour combien   de politiciens as-   tu   voté?
         for   how.many of politicians have you voted
         'For how many politicians have you voted?'
     b. *Combien   de politiciens as-   tu   voté   pour ?
         how.many of politicians have you voted for

Example (43a) shows that the preposition *pour* 'for' moves with the object and (43b) that it cannot be stranded. Yet, it is the *wh*-element *combien* 'how.many' that has to be moved to form a question. This suggests that the quantificational element embedded in a bigger constituent is active in the sense that it undergoes QR, in which case it carries along the material dominating it. Examples like (43) thus seem to support this analysis of SRefPs.

Another issue related to the movement of SRefPs concerns their landing site at LF. Keeping examples like (36) in mind, we need to account for the fact that at LF referential indefinites target a position in the clausal left periphery, which is to the left of the slot occupied by universal quantifiers. One possibility is to adopt an analysis à la Beghelli & Stowell (1997), based on previous work of theirs (Beghelli & Stowell 1994 and Beghelli 1995), according to which quantifiers belong to different categories, with specific syntactic characteristics and scope properties. At LF, these quantifiers target different positions organized hierarchically for feature checking reasons. Scope properties are hence a byproduct of these movements.

The details of the hierarchy proposed by Beghelli & Stowell are not relevant here; we will simply assume that the QR mechanism targets various functional projections of the clausal left periphery, labelled FP (for *functional projection*) in (44), and organized hierarchically.

(44) $FP_1 > FP_2 > FP_3 > \ldots$
      clausal left periphery

In a hierarchy such as (44), SRefPs like *des livres* in (36a) would target FP_1, whereas universal quantifiers like *tous les étudiants* 'every student' would move to FP_2.[9] As for the reason for the movement of SRefPs to the highest projection of the clausal left periphery, it can be related to the interpretation of these indefinites. Recall from section 3 that the reference of *des* NPs is dependent, in the sense that it often varies with the context (in the speaker's mind). Hence, these nominals seem to have a deictic feature that could be responsible for their movement to the highest layer of the clause, sensitive to context—that is, to pragmatic factors. In sum, it is

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[9] FP_3 would host SRefPs that covary with a universal quantifier (recall fn. 5).

the kind of reference represented by SRefPs that triggers their movement past QPs at LF.

4.1.4 *Some intermediate results*

The fact that not all *du/des* NPs can be replaced by *en* has allowed us to reach several conclusions concerning the structure of nominal expressions.[10] First, I have shown that the notion of referentiality cannot be binary, which contrasts with various works on the nominal structure. In other words, there is no [±referential] feature that has to be checked. Then, I suggested that the key feature of the *du/des* NPs that can be replaced by *en* is their property-denoting interpretation, whereas the one of the *du/des* NPs that cannot be pronominalized by *en* is their being referential. Accordingly, the former have been called property phrases and the latter speaker's reference phrases. On the basis of intervention effects, we have seen that there is a hierarchy between these layers in that referential arguments are structurally more complex than nonreferential ones, typically property-denoting arguments. Finally, I pointed out that it is the structure of nominals, and more precisely the presence of the QP-layer, that triggers QR: referential *des* NPs have scope properties because their left periphery comprises a QP layer. At the clausal level, SRefPs target the highest projection when their reference is dependent on the speaker (see sect. 3).

The next section focuses on quantitative examples, with which the clitic *en* is fine, and which are also instructive regarding the structure of nominal expressions.

4.2 *Quantitative* en *and the Inflectional Domain*

4.2.1 *The interpretation*

In section 2.2, we saw that quantitative examples differ structurally from partitive ones. This means that *beaucoup de livres* 'a lot of books', which is quantitative, does not have the same structure as *beaucoup des livres* 'a lot of the books', which is partitive. This section concentrates on the former and section 4.3 on the latter.

In my discussion of Milner's (1978) seminal work, I mentioned two issues to be addressed in the framework adopted here assuming fine-grained syntactic trees—namely, the position and the nature or category of *de* in quantitative examples like (3), repeated here as (45).

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[10] As observed by an anonymous reviewer, additional issues concerning *du/des* NPs need to be addressed. For instance, some contexts favor a distributive reading of *des* NPs, as in (i), although the neutral interpretation of these nominals does not have this characteristic, as in (ii).

(i) Des   enfants lisaient   une bande dessinée.
     of.the children were.reading a   comic.strip
     'Children were reading a comic strip.'
(ii) Des   voyous   ont cassé   une vitrine.
     of.the naughty-boys have broken a   shop.window
     'Naughty boys broke a shop-window.'

However, this issue is not directly related to *en* pronominalization, so I do not address it here.

(45) a. J'ai   lu   beaucoup/peu **de livres.**
         I have read many/few   of books
         'I have read many/few books.'
     b. J' **en** ai   lu   beaucoup/peu.
         I *EN* have read many/few

Although Kayne (1977), for instance, considers that *de* in quantitative contexts is a preposition, I will not adopt this position here. The main reason is that extraction facts show otherwise. Consider (46) (see Milner 1978:57).

(46) a. C'est **de Zola** que j'ai   lu   deux livres.
         It is of Zola that I have read   two   books
     b. …   des livres.   of.the books
     c. …   beaucoup de livres. a.lot of books

In (46), *de Zola*, the complement of *livres*, can be extracted from the object of *read*. As extraction from a PP is generally impossible (recall example (16) in sect. 2.1), this means that *deux livres*, *des livres*, and *beaucoup de livres* in (46) are not PPs and do not contain a PP. Otherwise, these examples would be ungrammatical, contrary to fact. Crucially, examples like (46) thus show that *de livres* in *beaucoup de livres* in (46c) is not a PP. In other words, *de* in prototypical quantitative examples involving *beaucoup/peu* 'a lot/a few' is not a preposition and therefore *en*, which is fine in (45), cannot be a pro-PP. The judgments concerning (46) sharply contrast with the ones for partitive examples from which *de Zola* cannot be extracted:

(47) a. *C'est **de Zola** que j'ai   lu   deux des   livres.[11]
          it is of Zola that I have read two of.the.PL books
     b. *C'est **de Zola** que j'ai   lu   beaucoup des   livres.
          it is of Zola that I have read a.lot   of.the.PL books

The ungrammaticality of these examples suggests that *deux des livres* 'two of the books' and *beaucoup des livres* 'a lot of the books' involve a preposition.

The hypothesis that *de* in quantitative constructions is not a preposition is supported by the fact that it cannot be followed by a determiner, in contrast with prepositions:[12] as mentioned earlier, the presence of a determiner in *beaucoup de livres* 'a lot of books' as in *beaucoup de ces livres* 'a lot of these books' or in

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[11] The ungrammaticality of this example cannot be due to the definiteness of *les livres* 'the books'. In (i), extraction out of the definite noun phrase *those reviews* is fine:

(i) Those reviews have been reprinted of Helen's first symphony.   (Cardinaletti & Giusti 2006:(22))

[12] Consider the following examples, in which a preposition can be followed by a bare nominal or by a nominal introduced by a determiner:

(i) à pied 'on foot' vs. à la gare 'at the station'
(ii) avec peine 'with difficulty' vs. avec son sac 'with her bag'

beaucoup des livres 'a lot of the books', leads to a partitive reading. In other words, as soon as a determiner occurs between *de* and the noun the quantitative interpretation gets lost. The fact that *de* and the noun cannot be split by a determiner is represented schematically and informally in (48).

(48) quantity > *de* > N

If *de* in the constructions under discussion is not a preposition, we need to determine what it is. Given that it occurs with quantities, let us consider this notion, which includes several subtle differences in interpretation, partly reported below.

   It is uncontroversial that the category 'quantity' includes items like *beaucoup* 'a lot' and *peu* 'a few/a little'. Whether numerals belong to the same category, as assumed here, is less straightforward. However, it is irrelevant whether a finer distinction between these two kinds of elements should be made here. One argument for conflating numerals and quantities like *beaucoup/peu* 'a lot/a few' comes from examples like (11), repeated here as (49) (see also Milner 1978 for further discussion supporting this observation).

(49) … ça fait   **deux de bonnets** que je perds.
        … it   makes two of hats   that I lose
                              (Bauche 1951:79–80, cited in Kayne 1977:112 fn.)

Because the numeral in (49) co-occurs with *de*, it suggests that such examples can be assimilated to (45). This is schematized in (50), parallel to (48).

(50) numerals > *de* > N

A quantity may also be null in the sense of 'no X, that is, no bread, no apples, etc.'. This is the case in negative constructions like (51).

(51) a. Je n' ai   pas lu   **de livres**
          I   *NE* have not read of books
          'I haven't read any books.'
      b. Je n' **en** ai   pas lu.
          I   *NE EN* have not read

What (51) means is that I have read no books. Here the quantity is zero, hence the term "null quantity." In other words, (51) expresses a quantity although it is null. This can be schematized as in (52) where the null quantity is represented by *ec* (empty category).

(52) *ec* > *de* > N

Example (52) is analogous to (48) and (50) in that *ec* sits in the same position as quantities like *beaucoup/peu* and numerals. A crucial difference, however, between

the *ec* postulated in (52) and the other quantities is that the former needs to be in the scope of a negative element like *pas* 'not', as in (51a) (Kayne 1981). The absence of a negative item leads to ungrammaticality:

(53) *J'ai   lu   de livres.
       I have read of books

The fact that the *de* NP illustrated in (51) needs to be in the scope of a negation implies that the distribution of these constituents is restricted to object positions. Consider (54), which shows that they are indeed banned from subject positions.[13]

(54) *Marie a   insisté pour que **d' étudiant** ne puisse   pas   entrer.
        Marie has insisted for that *DE* student   *NE* could.SUBJ not to. enter

That *de* in contexts with a null quantity (*ec*) is analogous to *de* in (48) and (50) is supported by extraction facts:

(55) C'est **de Zola** que je n' ai   pas lu   de livres.
       it is of Zola that I *NE* have not read of books

In (55), *de Zola* can be extracted from the object position without leading to ungrammaticality. This means that *de livres* is not a PP, and hence that *en*, which is fine with null quantities, as (51b) shows, does not only replace PPs, as claimed here.

The null quantity *ec* should not be confused with examples expressing no quantity at all, a characteristic attributed to bare nouns in English (Borer 2005). Consider (56).

(56) a. John bought apples and bread.
     b. Jean a   acheté des   pommes et du   pain.
        Jean has bought of.the.PL apples and of.the.MASC.SG bread

A note of caution is in order here: quantity should not be confused with number. The distinction is subtle in that it is difficult to determine whether the quantity perceived is due to encyclopedic knowledge or pragmatic factors or whether it is encoded in the nominal expression itself. The view I take here is that quantity is only encoded in a nominal expression when it cannot be inferred from (a combination of) other features. What this means is that *les* NPs 'the_PLUR NPs' mean *more than one* because they are plural and that *un* NPs 'a NPs' and *le*_count NPs 'the_SING/count NPs' imply the cardinality

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[13] Note that if the generalization is that the *de* NPs under discussion have to be in the scope of a negation, it predicts that postverbal *de*-NP subjects should be grammatical, a prediction borne out at least partially (Kayne 1981:126). Stylistic-inversion facts, however, seem to be less straightforward, as observed by an anonymous reviewer (see Kayne & Pollock 2001).

1 because they are count *and* singular (Farkas [2006], who proposes that singulars, including definites, have atomic reference by default). *Du* NPs and *le*mass NPs do not mean 1 because they are not count, although they are singular. Put differently, the nominals just mentioned are not considered as *encoding* a quantity, just like the bare nouns in (56a).

If *apples* and *bread* in (56a) do not involve a quantity, as mentioned earlier, it suggests that the corresponding *du/des* NPs in (56b) do not, either. In other words, in some contexts, *du/des* NPs do not express a quantity. However, it is well known that this is not always the case—that is, that *du/des* NPs may be quantitative (Milner 1978). One example is provided here:

(57) J'ai   acheté des   livres, *Hamlet*, *Moby Dick* et   quelques autres.
     I have bought some books *Hamlet* *Moby Dick* and some   others

In (57), *des livres* 'some books' involves a quantity although it is not clearly expressed, hence the term "undetermined" quantity, which is not to be confused with null quantity (Milner 1978:29–30). Although what an undetermined quantity is should be further investigated, it is important to underline that it differs from the null quantity *ec* in that it does not have to be licensed. Consequently, quantitative *du/des* NPs are not restricted to certain positions and excluded from others, contrary to *de* NPs involving a null quantity (recall (54)).

4.2.2 *The structure*

The discussion so far shows that a quantity can be represented by different means: it may be overtly expressed (*beaucoup/peu* 'a lot/few', numerals, etc.), null (*ec*), or undetermined (with some *du/des* NPs). An analysis of quantitative constructions should thus explain these distinctions and also the possibility for some nominals to express no quantity at all, as in (56b). These differences can be accounted for with the modular nominal inflectional domain reported in (58), where the projections in parenthesis are optional (see also Ihsane 2008 for further discussion and implications).

(58) ...NumP > (FP$_{quantity}$) > (FP$_{de}$) > (FP$_{count}$) > NP
     Inflectional domain   NP shells

One point made explicit in (58) is that quantity differs from grammatical number, as alluded to in the discussion of (56). Grammatical number is encoded in the highest layer of the inflectional domain, NumP (Ritter 1991) and determines the agreement of a verb with its subject—that is, whether the verb is morphologically singular or plural—or of an adjective with the noun it modifies, at least in languages with overt number morphology on verbs and adjectives. In other words, the information provided by NumP is whether the nominal expression is singular or plural. NumP thus encodes a feature [±plural]. The quantities discussed earlier, in contrast,

represent a constituent sitting in the specifier position of a functional layer, as proposed by Cinque for noun modifiers, including numerals (Cinque 1994). FP$_{quantity}$ hosts quantities, be they overt like *beaucoup/peu, plusieurs*, and numerals or not like *ec* in (51) and (52) and probably also the "undetermined quantity" characteristic of some *du/des* NPs, as in (57). This projection is absent from the structure of nominals that do not express a quantity, as illustrated in (56). That quantity should be considered as a grammatical category is supported by the fact that some nouns, like *blancheur* 'whiteness', are incompatible with any quantity (Milner 1978:33). Such nominals thus cannot have FP$_{quantity}$ in their structure.

As for FP$_{count}$, it encodes a [+count] feature. The idea is that listemes are not specified for the mass/count distinction, as proposed by Borer (2005): rather, they become count in specific contexts—namely, in the presence of some functional items like the plural morpheme, the count *le* 'the' and the indefinite article, all generated in the lowest functional projection of the inflectional domain. However, I depart from Borer's analysis in that I adopt the standard position on plurality, as a function from individuals. Informally, it means that count is related to atoms—that is, individuated elements—and not to a division of mass. In brief, we need atoms to count (in opposition to things which can be measured). I adopt this position because *des* NPs necessarily involve entities: (59) is about whole apples and whole houses.

(59) a. Kim a   mangé des   pommes cet après-midi.
       Kim has eaten of.the apples   this afternoon
   b. Pat a   construit des   maisons tout l' été.
       Pat has built   of.the houses all   the summer

The projection responsible for the count reading is thus labeled FP$_{count}$ in this analysis. Its presence in a structure leads to an atomized reading. Consequently, this projection is absent from the structure of mass nouns like *du* NPs as these nominals do not have atoms in their extension.

Although the [+plural] and the [+count] features somehow conflate (plurals are count in this analysis), the [−plural] and [−count] features do not, because [−plural] noun phrases may be mass (*du pain/le*$_{mass}$ *pain* 'bread/the$_{mass}$ bread') or count (*un pain/le*$_{count}$ *pain* 'a (loaf of) bread/the$_{count}$ bread'). This difference leads this analysis to dissociate grammatical number and count reading and to assume that these features are encoded in different projections as in (58).

Taking into account these points means that *de* should be located between FP$_{count}$, hosting the plural -*s* for example, and FP$_{quantity}$. I use the label FP$_{de}$ in (58), in the absence of a better label. What is innovative, however, in this structure is that *de* is treated as a functional element of the inflectional domain. This is an interesting outcome as it will allow us to deal with quantitative *en*.

The resulting structures for quantitative expressions are reported here, where $\varnothing$ indicates that a layer is not projected in the structure.

(60)   … $FP_{quantity}$ > FP_{de} > FP_{count} > NP

		$FP_{quantity}$	FP_{de}	FP_{count}	NP
a.	beaucoup de livres	beaucoup	de	-s	livre
a′.	beaucoup de pain	beaucoup	de	$\varnothing$	pain
b.	peu de livres	peu	de	-s	livre
b′.	peu de pain	peu	de	$\varnothing$	pain
c.	deux bonnets	deux	(de)	-s	bonnet
d.	(pas) de livres	ec	de	-s	livre
d′.	(pas)…de sel	ec	de	$\varnothing$	sel

In (60), $FP_{quantity}$ hosts quantities, be they overt like *beaucoup/peu, plusieurs*, and numerals or not like the empty category (*ec*) postulated in (51) and (52). Example (60) also takes into account the fact that numerals and *de* can co-occur, which suggests that FP_{de} is part of the structure of these nominals, possibly also when *de* is not overt as in *deux livres* 'two books' for instance. Whether the quantities are followed by a count or a mass noun is represented by the presence or absence of FP_{count}, respectively. A tree representation for *beaucoup de livres* in (60a) is provided here:

(61)
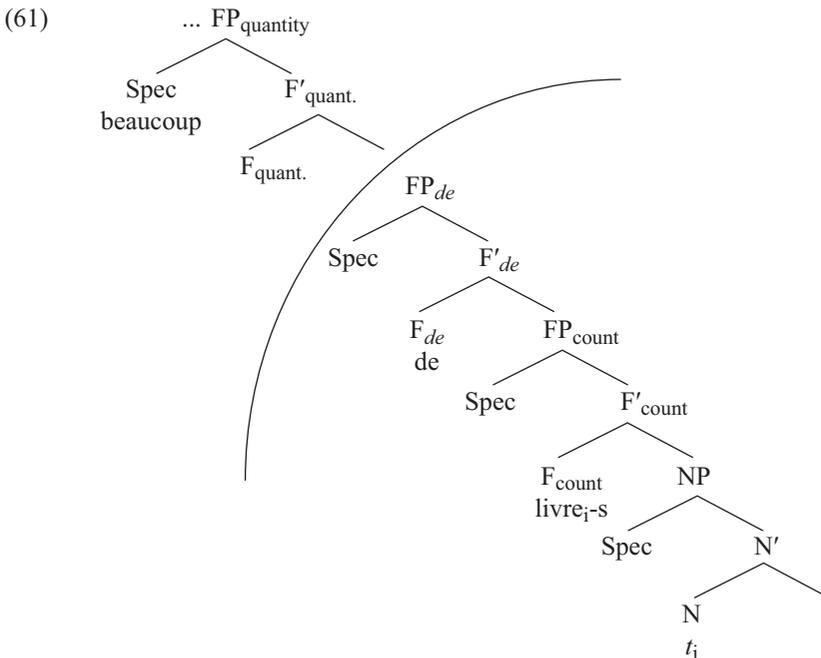
A crucial aspect of (60) is that it allows us to account for *en* pronominalization in quantitative constructions straightforwardly: the clitic *en* replaces a subpart of the nominal inflectional domain—namely, the complement of $FP_{quantity}$. In sum, the quantitative *en* stands for FP_{de}.[14] This is illustrated in (61) by the line above this projection.

FP_{de} is also pronominalized by *en* in examples like (62b).[15]

(62) *Speaker A*:
    a. J' ai vu   **des**   **en fants** dans la cour. Il s'agit   de Pierre,
       I have seen of.the kids   in   the yard it SE is.about of Pierre
       Paul et   Jacques.
       Paul and Jacques
       'I saw some children in the yard, namely Pierre, Paul, and Jacques.'
    Speaker B:
    b. J' **en** ai   vu   deux d' entre   eux.
       I EN have seen two of among them

In section 4.1, we observed that referential *des* NPs cannot be replaced by *en*. Because *des enfants* in (62) is referential, the question that arises is therefore what *en* replaces in this example. A clue comes from the presence of the numeral in (62b): I suggest that the *en* in this example is similar to the one in (5b) (*J'en ai lu deux* 'I EN have read two')—that is, a quantitative *en* replacing FP_{de}. Informally, the pronoun tells us what we are dealing with—namely, children (and not elves, for instance). The observation that *en* cannot replace a referential constituent thus still seems to hold. Crucially, *des enfants* is represented by the pronoun *eux* in (62b) and not by *en*. That quantitative *en* cannot involve reference was observed by Gross (1973) and reported by Milner (1978:52). According to these authors, *en* represents some kind of lexical reference—that is, reference as *Sinn* in Frege's terms, in opposition to *Bedeutung* (Frege 1884).

If *de* in *beaucoup de, peu de*, and *pas de* is generated in the inflectional domain, as proposed in (60), the question is whether this is also the case for *de* in *du/des* NPs. Ideally, the structure of these nominals should differ minimally from (60). This objective is met, as (63) shows. Example (63) represents the structure of a property-denoting argument introduced by *du/des*.

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[14] If *en* stands for FP_{de} in quantitative contexts with a numeral, it means that *de livres* 'of books' in (i) belongs to this category, too.

(i) J' **en** ai   lu   deux/plusieurs, **de livres.**
   I EN have read two/several   DE books

The reason is that an extraposed constituent like *de livres* in (i) allows us to identify what *en* replaces (Kayne 1977, Milner 1978): the idea is that the extraposed constituent reiterates the constituent pronominalized by *en*—namely, the FP_{de} *de livres*. In other words, the extraposed *de livres* is not a prepositional phrase.
[15] The judgments concerning this example differ. For some speakers, (62b) is unacceptable; *en* should be absent.

(63)

	(…) PropP >	NumP >	$FP_{quantity}$ >	FP_{de} >	FP_{count} >	NP
a. du pain$_{quantit.}$	du	<de+le$_{SING}$>	<de>	<de>	∅	pain
b. du pain$_{nonquantit.}$	du	<de+le$_{SING}$>	∅	<de>	∅	pain
c. des pains$_{quantit.}$	des	<de+les$_{PLUR}$>	<de>	<de>	-s	pain
d. des pains$_{nonquantit.}$	des	<de+les$_{PLUR}$>	∅	<de>	-s	pain

A nice result of this analysis is that the *de* component of the complex *du/des* is the same as the one in quantitative contexts—namely, a functional head of the inflectional domain and not a preposition (recall (46b)). However, (63) differs from (60) in two aspects. The first is that the *le/les* component of *du/des* is introduced, and the second is the fact that *de* moves from its base position to NumP, where it merges with *le/les*. The complex head *du/des* then moves higher up if the nominal expression is an argument. The function of these movements is to lexicalize the structure. In other words, at some point in the derivation, all the projections have to be filled. This means that there is no other trigger than lexicalization, in contrast with other types of movement like *wh*-movement, for instance (Michal Starke, p.c.).[16] Consequently, if the constituent is an argument interpreted as a property, the determiner will target PropP as illustrated in (63). If it is a SRefP, *des* will move to SRefP.

Another important result of (63) is that it does not only make a distinction between mass and count nouns but also between nonquantitative and quantitative *du/des* NPs, a contrast illustrated in (56) and (57). More precisely, the projection of $FP_{quantity}$ in the structure of *du/des* NPs gives rise to the undetermined quantity mentioned in the preceding section. The absence of $FP_{quantity}$ corresponds to the bare-noun interpretation.

Furthermore, (63) allows us to determine the function of the *le/les* component of *du/des*: it indicates number by specifying whether the constituent is singular or plural. This is interesting as it is consistent with the analysis of *le/les* NPs, which results from (58):

(64)

	… NumP >	$FP_{quantity}$ >	FP_{count} >	NP
a. le pain$_{mass}$	le$_{SING}$	∅	∅	pain
b. le pain$_{count}$	le$_{SING}$	∅	<le>	pain
c. les pains	les$_{PLUR}$	∅	-s	pain
d. un. pain	un$_{SING}$	∅	<un>	pain

In (64), the functional elements *le*$_{count}$, *un*, and *-s* are generated in FP_{count}, leading to the count reading of *le*$_{count}$ *pain, un pain*, and *les pains*. *Le*$_{mass}$ and *les* in (64a,c), in contrast, are generated in NumP, exactly like *le/les* in (63). In (64b,d), *le* and *un* move to (are remerged in) higher positions to account for their additional features. *Pain* in (64c) moves to the lowest inflectional projection to bind the plural morpheme (Borer 2005).

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[16] This means that in (60) some element, probably the leftmost item, will also move to the left periphery when the expression is an argument.

None of the nominal expressions in (64) have FP$_{quantity}$ in their structure because the quantities associated to them can be inferred: *un pain* and *le*$_{count}$ *pain* imply the quantity 1 because they are singular and count (see Farkas 2006) and *les pains* implies *more than one* because it is plural, as mentioned in the discussion of (56).

In sum, the modular structure advocated in (58) allows us to account for the various interpretative properties of the nominal expressions discussed here, a significant and welcome result. An additional aspect concerning *du/des* NPs and the clitic *en* has to be mentioned, though. If (63) is on the right track, it suggests that in *du/des* constructions *en* does not replace FP$_{de}$. If it did, the result would be (65c). This is because the components of *du/des*, namely *le/les* and *de*, merge in NumP, which is higher than FP$_{de}$. Example (65c) is, however, ungrammatical, in contrast with (65b).

(65) a. Jean a   vu   **des**   **étudiants.**
         Jean has seen of.the   students
     b. Il **en** a   vu.
         he *EN* has seen
     c. *Il **en** a   vu   **des.**
         he *EN* has seen le

One way out of the problem would be to assume that *des* in (65c) is deleted, as proposed by Kayne (1977; recall the discussion of (14)). However, there is no clear evidence for such an assumption.[17] Another possibility is to assume that *en* in *du/des* constructions replaces the entire nominal structure. This is exactly what I propose in section 4.1. In other words, we consider that *en* in *du/des* constructions differs from *en* in quantitative contexts like *beaucoup/peu de* represented in (60) in that it does not pronominalize FP$_{de}$.

This means that we reject a structure like (66) for *du/des* NPs, with some kind of quantity preceding the *du/des* element.

(66) …[quantity [*de* [*le/les* [N]]]]

The main problem with (66) is that it cannot extend to quantitative examples like *beaucoup/peu de*. Remember that no determiner can occur between *de* and N in the quantitative nominals represented in (60): the introduction of such an element leads to a partitive reading, which has a different structure (see sect. 2.2 and sect. 4.2.1). Adopting (66) would also mean that the position between *de* and N could only be filled in *du/des* NPs, which would have to be justified. The presence of *le/les* in *du/des* NPs cannot be related to the fact that quantitative *du/des* NPs represent a nonovert quantity (as in, "when the quantity is nonovert, *le/les* appears"). One reason is that *de* NPs which occur in negative contexts like (51) cannot have a determiner between *de* and N, despite their nonovert quantity (i.e., *ec*). Another reason is that some *du/des*

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[17] The deletion of *des* in the analysis developed here cannot be a case of haplology, a strategy that avoids the repetition of similar morphemes, given that there is only one *de* or *des* element (according to the *Port Royal Grammar*, two successive *de* are impossible because it would give rise to a cacophony).

NPs represent no quantity at all but still contain *le/les*, as in (56). Furthermore, the layer hosting *le/les* in (66) would have to be determined: it cannot be FP$_{count}$ as this projection is responsible for an atomized reading, which *du* NPs do not have because they are mass. Yet, *du* NPs do contain a *le* component. Finally, whether *le/les* in (66) and *le*$_{mass}$/*les* in (64) are similar is unclear in (66). Indeed, the fact that these articles may play the same function in *du/des* NPs and in *le*$_{mass}$/*les* NPs (i.e., indicate number) gets lost in (66). The structure reported in (58), in contrast, extends to the different nominal expressions discussed, taking into account the characteristics they share and the ones they do not.

In the next section, I briefly turn to genitive and partitive *en*, which are uncontroversial.

4.3 *Genitive* en *and Partitive* en *as PPs*

According to Milner (see sect. 2.2), genitive *en* and partitive *en* replace a PP introduced by *de* (*de* + N″ in his terms). I will stick to this analysis, assuming that the preposition selects a full DP, or a structure like (24) in this framework.

Genitive examples were provided earlier in the paper in (1), (7), (8), (9), and (17). These data are reported here:

(67) a. Jean se   souvient   [PP **de** [DP **tous ses étudiants**]].
      Jean REFL remembers   of   all   his students
   b. Il a   déjà   parlé   [PP **de** [DP **sa   maison**]].
      he has already talked   of   his house.FEM
                                   [PP **de** [DP **son travail**]].
                                        of   his job.MASC
                                   [PP **de** [DP **ses problèmes**]].
                                        of   his problems.PL
   c. Il   est drôlement fier   [PP **de** [DP **son idée**]].
      He is terribly   proud   of   his idea
   d. Il va   repeindre les portes [PP **de** [DP **cette maison**]].
      He is.going to.repaint the doors   of   this house
   e. Elle a   acheté des   photos [PP **de** [DP **Paris**]].
      she has bought of.the pictures   of   Paris

In these examples, *en* replaces the PPs in bold selected either by a verb (67a,b), an adjective (67c), or a noun (67d,e). The structure of such examples is thus uncontroversial.

As for the partitive reading, the example provided in (2)[18] is repeated here:

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[18] For reasons of space, I will not discuss partitive *du/des* NPs, which are restricted to the object position of some verbs like *manger* 'eat' as in *manger du gâteau* 'eat of.the cake' (Kupferman 1979, Englebert 1992). The idea, however, is that such constructions involve a partitive PP ([PP *de* [DP *le gâteau*]]), as in (68), and some kind of quantity analogous to *trois* 'three' in the example but nonvert.

(68) a. Jean a   acheté trois [PP **de** [DP **mes peintures**]].
    Jean has bought three   of   my   paintings
    'Jean bought three of my paintings.'
    b. Jean **en** a   acheté trois.
    Jean *EN* has bought three

In (68b), *en* replaces *de mes peintures* 'of my paintings', a PP. The precise position of this partitive PP in the nominal structure is debated in the literature. For Jackendoff (1977) and Milner (1978), it is the complement of an empty N, whereas for Cardinaletti & Giusti (2006) it is an argument of the quantitative element, as mentioned in section 2.3. I will leave the question open here.

   In conclusion, the fact that *en* can replace a PP is in line with the observation that *en* cannot pronominalize referential nominals. Although most PPs in (67) and (68) involve a referential DP, the PP itself does not have this characteristic, which is a property of nominal expressions.

5. Conclusion

The study of *en* in French has led us to adopt the following complex and modular structure for nominal arguments:

(69) (SRefP) > … PropP > FP$_{number}$ > (FP$_{quantity}$) > (FP$_{de}$) > (FP$_{count}$) > NP

Example (69) is modular in the sense that some of the projections advocated may be projected or not. Typically, FP$_{count}$ is only present in the structure of count nominals. It may host the plural morpheme, *le*$_{count}$ 'the' and *un* 'a' (Borer 2005). In the absence of these items, FP$_{count}$ is not projected. In the same vein, FP$_{de}$ is not always present in the structure of nominal expressions. It characterizes quantitative constructions and *du/des* NPs in general, be they quantitative or not. As for FP$_{quantity}$, it is projected to host overt quantities like *beaucoup/peu* 'a lot/a few' or numerals and the null quantity *ec*. It also allows us to distinguish between quantitative and nonquantitative *du/des* NPs. Finally, SRefP only concerns referential *des* NPs.

   The fact that some projections may be omitted in (69) does not go against the idea that there is some universal order of projections (see, e.g., Cinque 2005). As long as the hierarchy of the projections is respected, the structures are fine. Thus sequences like FP$_{count}$ > FP$_{quantity}$ or FP$_{quantity}$ > FP$_{number}$ would be ruled out because they do not respect (69). In other words, the syntax generates very fine-grained structures in which small parts may be omitted—that is, there are zones that need to be represented but parts of these zones can be left out without leading to ungrammaticality (Michal Starke, p.c.).

   Concerning the clitic *en*, the main conclusions of this analysis are:

- *en* does not only pronominalize PPs introduced by *de*.
- *en* may replace subparts of nominal structures, in particular FP$_{de}$—this is characteristic of the quantitative *en*.

- *en* may replace nonreferential *du/des* NPs labeled PropPs, but not referential *des* NPs labeled SRefPs.

Of course, a uniform proposal like Kayne's would be preferable to a list of projections. However, I have shown that *en* cannot be treated uniformly as a pro-PP. At several points, I tentatively mentioned that the lack of referentiality could be a possibility worth exploring. If this is correct, it predicts that *en* should be able to pronominalize predicates like *des athlètes* in *Marie et Susanne sont des athlètes* 'Marie and Susanne are athletes', as in (31a) (i.e., NumPs), and quantificational *du/des* NPs like *des licornes* 'of.the unicorns' in (30a) (i.e., QPs), when they are in an object position.

An important result of the analysis developed here is that it accounts straightforwardly for the ambiguity of well-known examples like (70), attributed to J. R. Vergnaud by Milner (1978).

(70) Ils ont attrapé dix lions mardi; mercredi ils en ont tué cinq.
　　they have caught ten lions Tuesday Wednesday they *EN* have killed five

The ambiguity of (70) is due to the fact that the sentence may be partitive or not. When it is, the five lions killed on Wednesday represent a subset of the ten lions captured on Tuesday. When it is not, the five lions represent different individual animals—that is, (70) is about fifteen felines. In terms of structure, this implies that in the former reading *en* replaces a partitive PP, whereas in the latter it replaces FP$_{de}$. Put differently, we are dealing with a partitive *en* in the former case and with a quantitative *en* in the latter case. This is represented in (71), with a dislocated constituent reiterating what *en* pronominalizes (see fn. 14).

(71) a. …mercredi ils **en** ont tué cinq, **de ces lions**.
　　　　Wednesday they *EN* have killed five of these lions
　　b. …mercredi ils **en** ont tué cinq, **de lions**.
　　　　Wednesday they *EN* have killed five of lions

Example (71a) illustrates the partitive *en* and (71b) the quantitative one. None of the constituents pronominalized by *en* is referential—(see the discussion of examples (67) and (68)).

Although the results presented in this paper are significant, many further issues need to be addressed. Future work should be comparative and deal with additional languages. Indeed, quantitative clitics are found, for instance, in Italian, Dutch, and Czech (Cardinaletti & Giusti 2006 and references therein).

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