

On some Prepositions that Look DP-internal: English *of* and French *de**

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Abstract

The article shows that, in spite of their DP-internal appearance, many instances of the English preposition *of* and of the French preposition *de* can be reanalyzed as being VP-external. Moreover, it is argued that what looks like movement of a bare quantifier turns out to be remnant movement. It is also claimed that each +N subpart of DP must get its own Case, which means that (non-head) phrases never have Case.

Key words: syntax, noun phrase, prepositions, Case, movement.

1. Mostly English

1.1. Introduction

The prepositions to be considered in this paper are primarily English *of* and French *de* (*d'* before a vowel) in sentences like:

- (1) John has lots of money.
- (2) Jean a beaucoup d'argent.
Jean has a.lot of.money

In such examples *of* and *de* appear to be contained within the phrases *lots of money* and *beaucoup d'argent*, respectively, and similarly for:

- (3) John was admiring a picture of Mary.

in which *of* appears to be contained within a constituent *a picture of Mary*.

This last example allows:

- (4) Who was John admiring a picture of?

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Chomsky (1977) proposed (based in part on Bach and Horn (1976)) that this kind of ‘subextraction’ is possible only if a ‘readjustment’ rule has previously applied, breaking up the object phrase. In Kayne (2000, 316) I suggested that no readjustment rule is needed - if one gives up a certain standard assumption about prepositions. The proposal was that *of* in (3) can be merged outside the VP, in which case *a picture of Mary* in (3) will automatically not be a phrase/constituent.

I would now like to consider the possibility that the same holds of (1) and (2), i.e. that *of* and *de* in those, too, can be merged outside VP, despite appearances. For English (1) this is clearly called for, given the proposed account of (4), since extraction of a parallel sort is sometimes possible in the case of (1), too:

(5) Money John has lots of.

I will begin by spelling out the proposal for English, and then turn in more detail to French.

1.2. *P and K merged above VP*

The derivation I suggested for (4) rested on the idea that *of* in (3) (and (4)) can be merged outside VP:

- | | |
|--|--|
| (6) ...admiring [John a picture] | → merger of <i>of</i> |
| ...of admiring [John a picture] | → movement of <i>John</i> to Spec, <i>of</i> |
| ...John _i of admiring [t _i a picture] | → merger of W and raising of <i>of</i> |
| ...of _j +W John _i t _j admiring [t _i a picture] | → movement of VP to Spec,W |
| ...[admiring [t _i a picture]] _k of _j +W John _i t _j t _k | |

More recently, in Kayne (2001), I adopted a suggestion of Ur Shlonsky’s (p.c.) that, transposed to this case, would amount to replacing the W above *of* in (6) by an Agr-*of* that is below *of* (and selected by *of*). The revised derivation of (3) would then look like:

- | | |
|--|--|
| (7) ...admiring [John a picture] | → merger of Agr- <i>of</i> |
| ...Agr- <i>of</i> admiring [John a picture] | → movement of <i>John</i> to Spec,Agr- <i>of</i> |
| ...John _i Agr- <i>of</i> admiring [t _i a picture] | → merger of <i>of</i> |
| ...of John _i Agr- <i>of</i> admiring [t _i a picture] | → movement of VP to Spec, <i>of</i> |
| ...[admiring [t _i a picture]] _j of John _i Agr- <i>of</i> t _j | |

This derivation (like that of (6)) has the intended property that *a picture of John* (in the last line) is not a constituent.

A possible further improvement is suggested by the observation that Agr(reement) is the name of a relation, strictly speaking, and therefore cannot plausibly be drawn from the lexicon. Thinking of Bayer et al.'s (2001) revealing use of K(ase) in their study of German,¹ let us, then, replace Agr-*of* in (7) by K-*of*. (Whether this K-*of* (or K-*de*) is closer to genitive or to dative will not matter for what follows.)

In German, K is often realized with overt Case morphology (more on D than on N), in particular in the presence of a preposition. An example is:

- (8) mit dem Mann
with the+K_{dative} man

The suffix *-m* is the dative Case morpheme K that here cooccurs with the preposition *mit*. (In English and French, K never has overt realization (other than with some pronouns).)

In addition, I take K, like P, to be mergeable above VP (and to have an EPP feature). The derivation of (3) is now:

- (9) ...admiring [John a picture] → merger of K-*of*
 ...K-*of* admiring [John a picture] → movement of *John* to Spec,K-*of*
 ...John_i K-*of* admiring [t_i a picture] → merger of *of*
 ...of John_i K-*of* admiring [t_i a picture] → movement of VP to Spec,*of*²
 ...[admiring [t_i a picture]]_j of John_i K-*of* t_j

From the perspective of Chomsky (2001), K in (9) should turn out to be an interpretable head parallel to T (or Asp or *v*),³ K should be associated with a set of phi-features, and the phrase moving to Spec,K should have (abstract) structural Case. Overt realization of the phi-features is arguably what we call adpositional agreement.⁴ That K is interpretable is suggested by the well-known fact that with certain locative prepositions in German the accusative vs. dative distinction correlates with a difference in interpretation (directional vs. non-).

In addition to sharing with (3) the possibility of preposition-stranding, (1) shares with (3) the more specific property that the stranding of *of* is degraded if *of* is followed by a particle:

1. On K, see also Bittner and Hale (1996) and Siegel (1974), and, for a general perspective into which the pair P,K might be integrable, Simpson and Wu (2000).
2. In a partly different way, movement of VP to Spec,P is also found in Barriers (1995, chapter 4).
3. A separate question is whether certain prepositions, e.g. *of*, are themselves uninterpretable ('empty prepositions' - cf. Chomsky's (1995) Full Interpretation principle).
4. Which may require that P and K end up contiguous with one another, thereby possibly excluding adpositional agreement in SVO languages - this would differ from the account suggested in Kayne (1994, 49).

- (10) Tell me who you're touching up a picture of.
 (11) ??Tell me who you're touching a picture of up.

This effect can be traced back to the fact that the last step of (9) will carry the particle along with the VP, resulting in (10). (11) can be derived only through recourse to something extra (particle preposing, in Kayne (2000, chapter 13)).

The same effect is seen with (1):

- (12) Money he's been handing out lots of.
 (13) ??Money he's been handing lots of out.

This parallel behavior suggests, in combination with the very existence of (12), that (1) allows a derivation comparable to the one given for (3) in (9):

- (14) ...has [money lots] → merger of *K-of*
 ...*K-of* has [money lots] → movement of *money* to Spec,*K-of*
 ...*money*_i *K-of* has [*t*_i lots] → merger of *of*
 ...of *money*_i *K-of* has [*t*_i lots] → movement of VP to Spec,*of*
 ...[has [*t*_i lots]]_j of *money*_i *K-of* *t*_j

Again as intended, *lots of money* in the last line of (14) is not a constituent.⁵

1.3. of and Case theory

Of is not always possible:

- (15) John has (*of) money.

This is brought out by the familiar pair:

- (16) They destroyed (*of) the documents.
 (17) They approved the destruction *(of) the documents.

5. It might be that *a picture of John* and *lots of money* are sometimes constituents (when there's no extraction); the text discussion could be adjusted accordingly.

As for exactly why extraction of *who* or *money* from within a constituent of the form *a picture of who* or *lots of money* would not be possible, Chomsky's (2001, 13) Phase-Impenetrability Condition may be relevant.

For the question of (apparent) pied-piping in:

(i) (?)the person of whom John was admiring a picture

See Kayne (2001, Appendix).

The usual way of approaching this last pair is to say that objective/accusative Case is not available in derived nominals. Thus in (17) *the documents* needs some other (structural) Case, which is provided by *of* (or by *K-of*).

There is also the converse question of the obligatory absence of *of* in (15) and (16). Let me assume that *of/K-of* cannot be introduced above VP earlier than the head that is responsible for objective Case.⁶ Consequently the direct objects in (15)-(16) will be checked for objective Case. That in turn will make them ineligible for further Case-related movement ('inactive' - Chomsky (2001, 6)), in particular for movement to Spec,K-*of*.

Partially similar to these facts is the contrast:

(18) John went to Paris.

(19) *John went of Paris.

Case-licensing by *of* is not sufficient. Arguably, this is because *of* cannot be merged prior to *to*.

One might think that overt *to* is needed for theta-assignment, but the following suggests otherwise:

(20) John went there.

There would seem to be a null preposition here (cf. Emonds (1985), Larson (1987)), given:

(21) John's trip there went smoothly.

If *of* could be merged prior to *to*, it could presumably be merged prior to the null counterpart of *to*, in which case (19) might be derivable, incorrectly.

More directly important to the main thread of this paper than (18)-(21) is:

(22) John bought a pound of apples.

(23) *John bought a pound apples.

The question is why *apples* here needs Case ('provided' by *of/K-of*) in addition to the objective Case associated with the containing phrase *a pound of apples*.

I would like to pursue an approach that amounts to taking Vergnaud's original Case proposal to the extreme. To take one simple example, he reasoned as follows. In some languages, *the documents* in (16) would have morphological Case. If we assume that it has abstract Case in English (and similar languages), we can account for certain restrictions (e.g. concerning the availability of overt subjects of infinitives).

Consider now:

6. I am leaving aside the interaction of *of* with subjects.

(24) They helped those ten important people.

In a language like Russian, the demonstrative, the numeral, the adjective and the noun would each bear (suffixal) morphological Case. Assuming that each of those four is nominal (+N), we can now understand the UG Case filter in much the way that Emonds (2000, 351) does:⁷

(25) +N Case Filter: Every nominal (+N) element requires Case.

Russian visibly displays the required Case on each of the subparts of the object, in sentences like (24). English displays it visibly on none. Other languages (e.g. German, Hungarian) might display it visibly on some, but not all of the subparts.

An independent question is whether the specific Case found on each of the four subparts of an argument is the same. In Russian, it sometimes is, sometimes not.⁸ The important point is that each requires some Case, which may be realized in a visible fashion (or not).

Given the +N Case Filter (25), it follows immediately that *apples* in (22)/(23) needs Case (despite not corresponding to a full argument).

The English facts concerning the presence of overt *of* are of course different with numerals:

(26) John bought three apples.

(27) *John bought three of apples.

This is true even if the numeral takes an indefinite article:

(28) John bought a million apples.

(29) *John bought a million of apples.

The fact that 'subextraction' is possible in (22):

(30) Apples he bought a pound of.

indicates, given our earlier discussion, that *of* and *K-of* can be merged above VP:

7. Although he wasn't directly concerned with DP-internal Case (see his p.362, note 39).

If the *-ing* of English gerunds is +N, the difference between (25) and Chomsky's (1981, 49, (6)) is diminished (cf. also Rouveret and Vergnaud (1980, 190)). On Case and Romance infinitives, whose integration into the text proposal remains to be accomplished, see Kayne (2000, 285) and references cited there.

I am taking nominative to be a Case (contrary to Bittner and Hale (1996, 6)) whose frequent realization as zero is to be compared to that of third person and of singular in agreement systems.

8. See Franks (1995, chapter 4).

- (31) ...bought [apples a pound] → merger of *K-of*
 ...*K-of* bought [apples a pound] → movement of *apples* to
 Spec,*K-of*
 ...apples_i *K-of* bought [t_i a pound] → merger of *of*
 ...of apples_i *K-of* bought [t_i a pound] → movement of VP to Spec,*of*
 ...[bought [t_i a pound]]_j of apples_i *K-of* t_j

Prior to what is shown in (31), the containing phrase 'apples a pound' has had its objective Case checked (see the discussion of (15) and (16)). The pair *of/K-of* (more precisely, *K-of* alone) is responsible for checking the Case of *apples*. Two questions arise. Why does *apples* in (28) not need *of/K-of*? And how does (*a*) *pound* in (22) (and (*a*) *million* in (28)) meet the Case requirement imposed by the +N Case Filter formulated as in (25)?

The answer to the first of these must take into account the fact that English differs in this area from some other nearby languages. For example, the need for *of* seen in (22) does not hold in German (see van Riemsdijk (1998)), and the required absence of *of* in (28) distinguishes English from French:

- (32) Jean a acheté un million de pommes.
 Jean has bought a million of apples

- (33) *Jean a acheté un million pommes.

I take it to be (virtually) certain that *pommes* in (32) is Case-licensed parallel to *apples* in (31).⁹ In addition, the Case-licensing of *apples* in (28) is arguably identical to that of *apples* in (26). Both (26) and (28) are probably to be thought of as similar to the Russian counterpart of (24), in which all four parts of the object would bear the same (dative) Case. In other words, the proposal is that in (26) the numeral *three* and the noun *apples* bear the same (here, objective/accusative) Case.

1.4. Case is limited to lexical items

The standard assumption is that this Case is also the Case of the whole phrase *three apples*. From a minimalist perspective, this is a notable redundancy, given (25). (Why should *three apples* need to have Case in addition to its (immediate) +N sub-parts having that same Case?)

The alternative (which I take to be the more attractive) is to take Case to be a feature of lexical items only. In (26), *three* and *apples* will each have structural Case that will be valued under agreement with a probe (*v*, in Chomsky (2001, 6)).

9. To consider the possibility of an objective (English) vs. oblique (French) difference of the sort proposed for prepositions in Kayne (1981) would take us too far afield.

Valuation (i.e. assignment of a value under agreement) will take place separately for *three* and for *apples*, though the result will look like Case-agreement, much as in Chomsky's (2001, 18) discussion of past participles (except that here what is at issue is Case within DP). Independent principles will (at least in English) prevent *three* from being moved to the Spec of that probe independently of *apples* and vice versa. Conversely, principles of pied-piping (to be worked out) will allow *three apples* to move to the Spec of the relevant probe.

Although *apples* in (26) can have its Case valued by v , that must in English not hold in (22), with *a pound* instead of *three*. On the other hand, English *a million* does act like *three*,¹⁰ whereas French *un million* acts like *a pound*. As in the discussion of (15) earlier, the assumption will be that Case (on *apples*) will be checked/valued by v if it can be (i.e. if *apples* is accessible to v), thereby precluding subsequent merger of *of/K-of*, so that (27) and (29) are excluded.¹¹

In (22) (and (32)), *apples* is not accessible to v (presumably as the result of a blocking effect induced by *a pound*,¹² in English as opposed to German). Subsequent merger of *K-of* will have the structural Case of *apples* valued by *K-of* and *apples* will move to Spec,*K-of*, as in (31). (The structural Case of *a pound* will, however, have been valued by v - whether movement of *a pound* takes place is not clear.)

1.5. English few/little; unpronounced NUMBER/AMOUNT

There is a distinction in English between:

(34) John has few books.

10. If *a* is nominal, the phrase *a million apples* will contain three elements each bearing the same Case. Possibly this is the result of DP-internal movement (see Uriagereka's suggestion mentioned in Kayne (1994, chapter 8, note 53)), which leads to the question of:

(i) *I have apples three.

French simple numerals are like English:

(ii) Jean a trois (*de) pommes.
Jean has three of apples

With right-dislocation, we have:

(iii) Jean en a trois, *(de) pommes.
Jean of.them has three of apples

where Case-valuation of *pommes* by v is not available, presumably because right-dislocation involves (leftward - see Cecchetto (1999) and Villalba (1999)) movement. Right-dislocation with no (overt) clitic acts the same:

(iv) Jean a pris les rouges, *(de) pommes.
Jean has taken the red of apples

11. Beyond the scope of this article is English 's, as in *a woman's picture* vs. **butter's pound*. I also leave aside here the question of nominative Case.

12. In which case, the relative order of *a pound* and *apples* within the DP in the derivation (31) should be reversed, and similarly elsewhere.

(35) John has little money.

Little cannot be replaced by *few*:

(36) *John has few money.

Nor, keeping the interpretation constant, can *few* be replaced by *little*:

(37) *John has little books.

This kind of number agreement is not found in French, where *peu* is used both with plurals and with singulars:

(38) Jean a peu de livres.
Jean has few of books

(39) Jean a peu d'argent.
Jean has little of money

The fact that *peu* in these examples must be followed by *de*:

(40) *Jean a peu livres/argent.

will play a role later on. For now, it is sufficient to note that we can express this by saying that *peu* blocks the (accusative) Case valuation of *livres/argent* that holds in (26) and (28), as well as in (34) and (35).

The *few/little* distinction is of course paralleled by:¹³

(41) John doesn't have many/*much books.

(42) John doesn't have much/*many money.

English has no *of* in such cases:

(43) *John has few of books.

(44) *John doesn't have many of books.

13. In my English, simple *much* is a polarity item (cf. Klima (1964, 284)):

(i) *John has (very) much money.

To a lesser extent, this holds for me with *many*:

(ii) John doesn't go to many concerts.

(iii) ?John goes to many concerts.

(i) contrasts with:

(iv) John has much more money than Bill.

Also:

(v) John is smarter than Bill by a lot/*much.

and similarly with *little* and *much*:

(45) *John has little of money.

(46) *John doesn't have much of money.

We can thus say that *few/little/many/much* do allow (accusative) Case valuation of the NP *books/money*, parallel to English numerals.

On the other hand, *few* looks more like an adjective and less like a numeral with respect to the comparative suffix *-er* (and similarly for superlative *-est*):

(47) John has fewer books than Bill.

We can express this by taking (47) to be as in:

(48) ...fewer NUMBER books...

Similarly, (34) is:

(49) ...few NUMBER books

That is, *few* is in fact an adjective interpreted like *small* whose associated noun can only be an unpronounced counterpart of *number*. Unpronounced NUMBER will allow the same (accusative) Case to be valued on *books*, as reflected in the absence of *of* in (34) and (47), even though the overt noun *number* does not allow this and so requires *of*:

(50) John has a small number *(of) books.

In the same vein, (35) is:

(51) ...little AMOUNT money

Here it is immediately plausible that *little* in (35) is really an adjective (modifying AMOUNT).¹⁴

Something more needs to be said, however, given:

(52) John has a few books.

(53) John has a little money.

The analysis will again be:

14. Although with overt *amount*, *little* is not entirely natural:

(i) ?John has a (very) little amount of money.

NUMBER and AMOUNT, as well as *number* and *amount*, may be identical but for one feature, given:

(ii) John has a large number/*amount of friends.

(iii) John has a large amount/*number of money.

(54) ...a few NUMBER books

(55) ...a little AMOUNT money

The difference in interpretation between *a few/a little* and *few/little* may be attributable to the necessary presence of an unpronounced ONLY with the latter pair. This ONLY is probably absent in the comparative example (47); the comparative is likewise incompatible with *a*:

(56) *John has a fewer books than Bill.

It is arguably ONLY that is responsible for negative polarity licensing in:

(57) Few chemists will have anything to do with that.

If unpronounced ONLY is incompatible with *a*, we can account for:

(58) *A few chemists will have anything to do with that.

The adjectival character of *few* is also brought to light by *enough*:

(59) John became wealthy enough to retire.

(60) John owns few enough houses as it is.

As discussed by Bresnan (1973, 285) and Jackendoff (1977, 151), adjectives move leftward past *enough*. If *few* is an adjective, (60) is not surprising. Nouns act differently:¹⁵

(61) John owns enough houses/*houses enough as it is.

Somewhat similarly, *too* takes adjectives directly, as opposed to nouns:

(62) John is too wealthy.

(63) *John has too money.

15. In what is for me archaicizing English, there are some examples showing noun movement:

(i) John has (*this) bread enough to feed his family.

The restriction concerning determiners was noted by Bresnan (1973, 285), who seems to accept examples like (i) more readily than I do. Note also:

(ii) *John owns a few enough houses as it is.

presumably akin to (56).

Bresnan (p.286) takes *enough* to be parallel to *much*, which I (in agreement with Jackendoff (1977, 151)) don't, in particular because of (60).

I agree with Bowers (1975, 552) that (iii) is relatively acceptable, suggesting that what moves past *enough* (here, *more interesting*) is (in general) a phrase rather than a head:

(iii) Is he a more interesting enough player than John to warrant our hiring him?

If *few* is an adjective (and the same for *little*, *many*, *much*), the following is expected:¹⁶

(64) John has too few friends.

Unpronounced NUMBER/AMOUNT cannot occur with other adjectives than *few/little* (and *many/much*), at least in the presence of *a*:¹⁷

(65) *John has a small/large books.

(66) *John has a small/large money.

The preceding proposal for *few/little* carries over directly to *many/much*, which can now be taken to be adjectives with an interpretation like that of *large* that co-occur only with unpronounced NUMBER/AMOUNT. There is thus no need to postulate a category Q for *few/little/many/much*. Their specificity is in effect inherited from the nouns *number/amount* that they modify.¹⁸

NUMBER, which I have represented as singular, takes plural verb agreement, as in (67), like overt *number*:

(67) (A) few linguists know(*s) the answer to that question.

(68) (Only) a small number of linguists know(*s) the answer to that question.

16. That *few/little/many/much* are adjectives was proposed by Bowers (1975, 542), though he did not postulate the presence of NUMBER/AMOUNT.

Given the variety of adverbs in *-ly* that English has, the absence of (ii) needs elucidation:

- (i) They arrived in large/small numbers.
- (ii) *They arrived manily/fewly.

17. It may be that NUMBER occurs with numerals:

- (i) John has three NUMBER books.

in classifier-like fashion - see Cheng and Sybesma (1999). An important difference between numerals and *many/few* is discussed by Doetjes (1997, 189-193) - cf. perhaps *John is three/*few years old*.

A (structural) distinction between classifier and non-classifier nouns would allow one to account for:

- (ii) The number three is a small number.
- (iii) *The number three is a few.

if NUMBER can only be a classifier.

18. In dispensing with this Q category, I am departing from Bresnan (1973) and Carlson (1977, 523), who introduces an abstract AMOUNT that is realized as *much/many*, rather than modified by them.

Number and *amount* can be plural only in restricted ways:

- (i) Large/*ten numbers of people came to the party.
- (ii) Large/*ten amounts of flour have gone to waste.

In part this recalls:

- (iii) (*Large/*ten) Oodles/hundreds of people came to the party.

The presence of NUMBER with *few* and *many* provides an answer to a puzzle noted by Svenonius (1992, 106). If *few* and *many* are adjectives, like *numerous* and *famous*, why does one find the following contrast?:

(69) Few/many are very intelligent.

(70) *Numerous/*famous are very intelligent.

The answer lies in:

(71) A small/large number are very intelligent.

Conversely:

(72) *Few/*many ones can be found in this city.

(73) ?Numerous/(?)famous ones can be found in this city.

Again, *few/many* is parallel to overt *number*:

(74) *A small/large number of ones can be found in this city.

The status of (69) and (72) reflects the presence of NUMBER (which is not present in (70) or in (73)¹⁹).

Many/much differ from *few/little* in being less able to take *a*:

(75) *John has a many books.

(76) *John doesn't have a much money.

Possible is:²⁰

(77) John has a great/good many books.

This in turn is not possible with *few*:

(78) *John has a great/good few books.

From the perspective of my proposal, this can be related to the contrast:

(79) John has a good ?large/*small number of books.

19. More exactly, *numerous* does not modify NUMBER in the way that *few* and *many* do; whether *numerous* in some sense incorporates NUMBER is a separate question.

20. This recalls:

(i) John has a great/good/*better/*large deal of money.
suggesting that *deal* might be an adjective rather than a noun:

(ii) ...a great/good deal AMOUNT of money

Better than (78) is:

(iii) (?)John has a very few books.

pointed out by Jackendoff (1977, 130n) as a problem for his claim that *few* in *a few* is a noun.

1.6. Unpronounced MANY and MUCH

Number and *amount* contrast in the following way:

(80) John has a number of chemistry books.

(81) *John has an amount of French money.

(81) becomes possible if an appropriate adjective or relative clause is added, e.g.:

(82) John has a large amount of French money.

This suggests that (80) contains an unpronounced adjective, perhaps MANY:

(83) ...a MANY number of...

If so, then *number* can license MANY (in (80)) just as *many* can license NUMBER, as in:²¹

(84) John has many NUMBER friends.

which is parallel to (49). (MANY and NUMBER cannot, however, license each other.)

The postulation here of an unpronounced MANY recalls Jackendoff's (1977, p.152) discussion of the contrast between (60) and:

(85) *John owns many enough houses.

The same holds for *little* vs. *much*:

(86) John owns little enough property as it is.

(87) *John owns much enough property.

The intended readings of (85) and (87) are expressed by:

(88) John owns enough houses/property.

21. I leave open the question of *many*/**few* a *linguist*, perhaps akin to Italian *qualche linguista* ('some linguist'), which despite its singular form has a plural interpretation corresponding to English *some linguists*; cf. also *every linguist* and (almost) *any linguist*.

The licensing of MANY by *number* seems also to depend on the determiner (see Jackendoff (1977, 124n)):

(i) *John's number of chemistry books is impressive.

This suggests an analysis close to Jackendoff's, in which (88) contains unpronounced MANY/MUCH.

Other degree words take overt *many/much* and cannot take MANY/MUCH, e.g.:

(89) John owns too *(many) houses.

(90) John owns so *(much) property that...

The generalization appears to be that unpronounced MANY/MUCH occurs in English with precisely that degree word that triggers leftward movement of adjectives past it, suggesting that (88) is:

(91) ...MANY_i/MUCH_i enough t_i houses/property

and that in the context of a degree word unpronounced MANY/MUCH must move in this way in order to be licensed.²²

(91), by allowing us to have degree words take only adjectives (and never nouns), provides a natural account of (61), i.e. of the fact that nouns don't move past *enough*, if we say that at least in (colloquial) English it is only the complement of *enough* that can move past it (alternatively, noun/NP movement is blocked by the intervening presence of MANY/MUCH).

Since MUCH and MANY are adjectives, it is plausible to claim that degree words are not. (If degree words are in addition not +N, they will not need Case.) The non-adjective *enough* therefore contrasts with its (near-)synonym *sufficient*, which seems clearly to be an adjective, and thereby to have distinct syntactic behavior, as in:

(92) John is sufficiently/*enoughly rich.

(93) John has rich enough/*rich sufficiently friends.

(94) John has a sufficient/*enough amount of money.

(95) insufficient(ly); *unenough

The closest French counterpart of *enough*, which is *assez*, does not call for English-type inversion:²³

(96) Jean est assez intelligent pour comprendre.

Jean is enough intelligent to understand

Thus the English word order must be mediated by some parametric property of *enough* vs. *assez*.²⁴

22. Cf. perhaps Rizzi's (2000, 316) discussion of null topics in German.

23. Old French was like English, and some regional dialects still are, according to Grevisse (1993, §937).

24. Whatever the optimal formulation of that parameter, it recalls Holmberg and Sandstrom's (1996) notion of 'minor parameter'.

French also has a counterpart of *sufficient(ly)*:

- (97) Jean dépense suffisamment peu d'argent.
 Jean spends sufficiently little of.money

Unlike English, French allows:

- (98) Jean dépense suffisamment d'argent.
 Jean spends sufficiently of.money

The interpretation is that of:

- (99) (?)John spends sufficiently much money.

Although (99) is not entirely natural, the word-for-word equivalent of (98) is far worse:

- (100) *John spends sufficiently money.

As discussed by Doetjes (1997, 102) (see also Grevisse (1993, §607)), (98) is part of a more general property of French, which allows various adverbs to 'look like' quantifiers, e.g.:

- (101) Enormément d'argent a été dépensé l'année dernière.
 enormously of.money has been spent the.year last

The obvious proposal, from the perspective developed so far, is that these adverbs are not quantifiers themselves, but rather in (98) and (101) are modifying the French counterpart of MUCH/MANY:²⁵

- (102) ...suffisamment MUCH d'argent

25. Cf. Selkirk (1977, note 13).

Arguably, French has no exact overt counterpart of *much/many* at all. A candidate is *tant*, with complications that would take us too far afield.

A pair that fits into the text discussion is:

- (i) Jean a trop peu d'argent.
 Jean has too little of.money

- (ii) Jean a trop d'argent.

where (ii) has the interpretation 'too much' and the analysis:

- (iii) ...trop MUCH AMOUNT d'argent

The fact that (ii) contains MUCH and cannot contain LITTLE (i.e. the interpretation cannot be that of (i)), which is also true of (83) and (91), presumably reflects some notion of 'markedness' that must be flexible enough to allow plural MANY to be unpronounced in (iv) (and in (83) and (91)):

- (iv) Jean a trop d'amis.
 Jean has too of.friends

1.7. *More on Case*

The question now is why English prohibits (100), and similarly for:

(103) ?He has invited enormously many people.

(104) *He has invited enormously people.

(105) *He has invited enormously of people.

Let me try to formulate an answer in Case terms. In (98)/(102), whose fuller structure is:

(106) ...suffisamment MUCH AMOUNT d'argent

the noun *argent* is Case-licensed via *de/K-de*. The fact that English disallows (105) is almost certainly the same fact as:

(107) *He has invited enormously many of people.

English *many* and *MANY* (more exactly, 'many NUMBER' and 'MANY NUMBER') do not permit *of* in (on (109), see (91)):

(108) *He has invited many of people.

(109) *He has invited enough of people.

In all of (105)-(109) NUMBER does not block (accusative) Case valuation of *people* by *v*, so that *people* is 'frozen' relative to further Case-related movement (to Spec,K-*of*).

As for (104), a relevant fact is that French shows a sharp contrast between (98)/(101) and:²⁶

(110) *Jean dépense très d'argent.

Jean spends very of.money

A possible proposal is that adverbs in *-ment* are (or can be) +N in French, but *très* is not, and that (110) is excluded as a result of:

26. Possible, without *de*, is:

- (i) Jean a très faim.
Jean has very hunger

presumably without MUCH, too. This requires further work.

I also leave open the question of derived nominals:

- (ii) They approved the destruction *(of) the city

See also Giusti and Leko (1995).

(111) The structure in (106) is well-formed only if the adverb is +N.

This in turn might follow from:

(112) Unpronounced MUCH/MANY must be licensed by an overt +N element.

((112) assumes that *enough* in (88) is +N, that the licenser in (80) is +N *number* and that *trop* in (190) below is +N.) Given (112), (104) would be excluded if English *-ly* adverbs (arbitrarily) could not be +N. A more attractive alternative would be to look to the interaction of MUCH/MANY and agreement and to say, thinking ahead, that (106) is (for reasons to be discovered) incompatible with DP-internal phi-feature agreement of the sort discussed in (124)-(161) below (which French alone would lack).²⁷

In extending the requirement of Case to (nominal) subparts of arguments, the +N Case Filter may allow us to integrate:

(113) John bought too big a house.

(114) John bought too big of a house.

In (113), *big* and *house* both have their accusative Case valued by *v*. In the colloquial (114), this is not possible (perhaps due to a blocking effect of the adjective), so that *K-off* is needed to value Case on *house* (and perhaps also on *a*).

If *off* is nominal (and can receive some sentential Case), this might carry over to the similar pair:²⁸

(115) John fell off the table.

(116) John fell off of the table.

although not to:

(117) John is such (*of) an idiot!

(118) What (*of) an idiot!

The presence of the adjective in (114) seems to be part of the answer (it must be involved in the blocking), or perhaps a good part of the answer (if *off* is an adjective or at least +N).

27. This might allow an account of the fact that Catalan lacks (98)/(101) (despite having *de* in some cases parallel to (97)) - given that Catalan (sometimes) has agreement in the presence of *de* - see Martí Girbau (2001).

28. The significance of this similarity is supported by the fact that (114) is limited to American English (according to Kennedy and Merchant (2000, 125)), as is (116) (according to Merat (1974, 229)).

Merat (1974, 212, 229) also gives *all of the students* as less frequent in British English, raising the possibility that the blocking of simultaneous Case-valuation of *the students* and *all* is responsible for that *of*, too.

Note that extraction is possible in:

(119) What table did he fall off of?

implying, given our earlier discussion, that this *of* can be merged outside VP. Extraction is not possible in:

(120) *What did he buy too big of?

This, however, may be due to the pre-N determiner in (114) (limited to *a* - see Bennis et al. (1998)),²⁹ in which case the *of* of (114) could be VP-external, too.

The +N Case Filter requires that all adjectives have Case (assuming they are all +N), and thereby makes it less surprising that some are preceded by a (Case-licensing, in conjunction with K) preposition.³⁰ French has, for example:

(121) Jean a quelque chose *(de) lourde.
Jean has some thing of heavy

(122) Jean en a un (de) rouge.
Jean of.them has one of red

To judge by:

(123) John has something heavy

English allows accusative valuation to reach the adjective in this context, while French does not (for reasons that need elucidation). (122) may reflect two distinct structures, one like (121), one like (123).³¹

1.8. Phi-feature agreement

Unlike English (and French), Italian shows number and gender agreement in:

(124) Gianni ha poco tempo.
Gianni has little(m.sg.) time

29. Note that, if anything, the following is less bad than (120):

(i) *What did he buy too big of a?

30. On the other hand, I have no examples of demonstratives or numerals Case-licensed prepositionally.

That numerals (except *one*) are nouns is argued by Jackendoff (1977, 128ff.). (For my purposes, +N is sufficient.)

That (121) reflects (genitive-like) Case was suggested by Doetjes (1997, 155n).

31. Catalan from this perspective entirely disallows simultaneous Case-valuation of (its counterparts of) *un* and *rouge* in (122) and requires *de* - see Martí (1995).

Adjectives in predicate position must be Case-licensed, too, given (25), as in Emonds (2000); for a different view, see Pereltsvaig (2001).

The Case-licensing requirement on adjectives might allow rethinking Baker and Stewart (1997) in Case terms (as opposed to their theta approach).

- (125) Gianni ha poca speranza.
Gianni has little(f.sg.) hope
- (126) Gianni ha pochi libri.
Gianni has few(m.pl.) books
- (127) Gianni ha poche idee.
Gianni has few(f.pl.) ideas

Italian makes no distinction of the *few/little* type, but the Italian word for *few/little* agrees in number and gender with the noun. This is so despite the fact that the structure of, e.g., (127) is, if we transpose our earlier proposal from English to Italian:

- (128) ...poche NUMBER idee

The question is why *poche* agrees with *idee* if it's really modifying NUMBER. Let me approach this question through English and then French. Consider:

- (129) John isn't that smart.

From a DP perspective, it would appear plausible to take *that* here to be a head whose complement is AP. On the other hand, for the case of ordinary demonstrative *that* occurring with NP, Giusti (1994, 249), Sigler (1997, p.106), Bernstein (1997) and Franks (1995, 101) have proposed that *that* should be considered to raise from a lower position into Spec,D. That kind of analysis for (129) could be given the following form. (129) is derived from a structure resembling:

- (130) John isn't as smart as that.

Or, thinking of Bennis et al. (1998), from:

- (131) ?John isn't smart like that.

This would bring together the *alls* of the following:

- (132) John isn't all that smart.
- (133) John isn't as smart as all that.

Similarly for the *abouts* of:

- (134) John is about that tall.

(135) John is about as tall as that.

Whereas the following are now seen to display a single restriction:

(136) *John is well over that tall.

(137) *John is as tall as well over that.

These two contrast with:

(138) John is well over six feet tall.

Assume, then, that (132) is derived from:

(139) ...smart LIKE all that

(or perhaps from ‘...AS smart AS all that’) via movement of *all that*.³²

French doesn’t have *that* (or *this*) preceding adjectives, but it does have (with an interpretation close to *very*):

(140) Jean est tout petit.
Jean is all small

A plausible source, parallel to (139), is:

(141) Jean est petit comme tout.
Jean is small like all/anything

More exactly, (140) would be:

(142) ...petit COMME tout

with movement of *tout* (or perhaps of ‘COMME tout’) to some higher Spec.

Of interest is the fact that *tout* in (140) agrees in gender.³³

(143) Marie est toute petite.
Marie is all(f.sg.) small(f.sg.)

32. Bowers’s (1975, 540) proposal to relate (i) and (ii) by rightward movement:

(i) John is far more intelligent than Bill.

(ii) John is more intelligent by far than Bill.

can be recast in terms of leftward movement of *far*, with (i) being:

(iii) ...more intelligent BY far...

and similarly for *two feet higher* (from ‘...higher BY two feet’), etc.

33. Though arguably not in number - see Kayne (1975, §1.5) - which I take to be orthogonal to the main point.

Without movement, it would not:

(144) Marie est petite comme tout/*toute.

Although it might not be impossible to integrate this agreement of *tout/toute* into a lexicalist checking approach of the sort considered in Chomsky (1995, 239),³⁴ another possibility, thinking in particular of Bernstein (1991) on DP-internal agreement in Walloon, would be to take (143) to be:

(145) ...tout -e petite

with the first -e (and perhaps also the second) an independent head.

If so, then (128) might be reinterpreted as:

(146) poch- NUMBER -e idee

with -e needing a +N host at PF.

A more 'extreme' case of this kind of syntactic dissociation of an agreement suffix (see also Julien (2000) and Koopman and Szabolcsi (2000, 39)) comes from Italian *tropp-* ('too'). Consider:

(147) Gianni è troppo intelligente.
Gianni is too intelligent

(148) Gianni è troppo poco intelligente.
Gianni is too little intelligent

In the spirit of preceding proposals, we have for the first:

(149) ...troppo MUCH intelligente

Similarly, given:

(150) John has too many books.

(151) Gianni ha troppi libri.

the natural proposal is:

34. Note that the lexicalist approach to agreement considered by Chomsky does not directly extend to Romance subject clitics, which are strongly agreement-like in certain respects, especially in those French and Italian dialects where subject DPs are obligatorily doubled by a subject clitic, yet are not in any obvious sense analyzable as a verbal affix. Similar questions arise for obligatory object clitic doubling.

(152) ...troppi MANY libri

or more exactly:

(153) ...too many NUMBER books

(154) ...troppi MANY NUMBER libri

Compared to English, Italian has one extra element that is unpronounced.

Yet *troppi* (m.pl.) agrees with *libri*. (The other forms would be *tropo*, *troppa*, *troppe*.) The same holds if in place of covert MANY in (154) we have the overt Italian counterpart of *few* (which also agrees - cf. (126)):

(155) Gianni ha troppi pochi libri.
Gianni has too few books

The agreeing form *tropo* is all the more striking as it does not appear in the corresponding predicate sentence (although *pochi* continues to agree):³⁵

(156) I libri di Gianni sono troppo pochi.
the books of Gianni are too few (in number)

The contrast between the agreeing form *tropo* in (155) and the non-agreeing form *tropo* in (156) recalls (in part) German, in which prenominal adjectives have an intricate agreement paradigm but predicate adjectives don't agree at all. A proposal in the spirit of (146) would be:³⁶

(157) tropp- [-i [poch- NUMBER [-i libri]]]

with multiple number/gender heads dependent in determiner-like fashion on the presence of NP (see Kester (1996) on Germanic).

(146) and (157) recall Corver (1997, 140) on the Dutch counterpart of *the biggest possible N*, in which the agreement suffix follows *possible* rather than *biggest*, in effect then simply following a certain complex phrase.

If we now combine (154) and (157), (151) will be:

(158) tropp- [[MANY NUMBER [-i libri]]]

whose wh counterpart (*how many books*) will be:

35. Franca Ferrari (p.c.) points out that clitic *ne* also yields non-agreement of *tropo*:

(i) Gianni ne ha troppi pochi.
Gianni of.them has too few

36. Whether *tropo*/*too* could reach their surface position by movement as was suggested for (143) and (129) is left an open question. Note that Spanish *demasiado* ('too') looks phrasal.

(159) *quant-* [[MANY NUMBER [-i libri]]]

in which *quant-+i* is not a constituent, from which follows the fact that it cannot be moved:

(160) **Quanti hai comprato libri?*
 how-many have-you bought books

The impossibility of the corresponding English sentence:

(161) *How many have you bought books?

would follow in the same way if English has an unpronounced counterpart of the *-i* of (159) that cannot be stranded.³⁷

1.9. a little *and* a lot

In some contexts, they look parallel:

(162) You should help them a little.

(163) You should help them a lot.

My proposal for *little* has been that it is an adjective that can modify unpronounced AMOUNT:

(164) ... (a) little AMOUNT (money)

Lot, on the other hand, appears to itself be a noun (that does not modify AMOUNT or NUMBER), as reflected by the following contrasts:

(165) John has little/*lot money.

(166) John has a little/*a lot money.

(167) John has a lot of/*a little of money.

(168) John has a whole/an awful lot of/*a whole/*an awful little (of) money.

The *of* of these last two can be VP-external, given:

37. Similarly for Italian *quali libri* ('which books'):

(i) *qual-* [-i libri]

and for English *which books*. In this vein, note the contrast:

(ii) **Whose were you talking to sister?

(iii) ??Who were you talking to 's sister?

See Kayne (2000, 109).

On **un gran numero -e (di) tavole*, cf. in part *enough* in Dutch - van Riemsdijk (1992, 507).

(169) (?)What (else) does he have a lot of?

The derivation will be:

- (170) ...has [what a lot] → merger of K-of
 ...K-of has [what a lot] → movement of what to Spec,K-of
 ...whati K-of has [ti a lot] → merger of of
 ...of whati K-of has [ti a lot] → movement of VP to Spec,of
 ...[has [ti a lot]]j of whati K-of tj → wh-movement

A lot of differs from *a little*:

(171) *What (else) does he have a little?

That the key is *of* is further suggested by:

(172) (?)What (else) does he have hundreds of?

(173) *What (else) does he have a hundred?

The reason must be as follows. In agreement with Chomsky (1977, 114), successful 'subextraction' of the sort found in (169) and (172) depends on *a lot of what*, *hundreds of what* not being a constituent (when wh-movement takes place). My proposal has been that the required non-constituency comes about, as seen in (170), through Case-related movement (here, of *what*) to Spec,K-*of*. If in the absence of overt *of*, no such Case-related movement can take place, the impossibility of (171) and (173) will follow.³⁸

38. This suggests that English has no covert *of* capable of inducing movement in that way, and that accusative Case-valuation of the noun of the sort seen in (165) and (166) with *little*, as well as in:

(i) He has a hundred books.

takes place without movement.

The reason for the contrast:

(ii) *He has a hundred of books.

(iii) ?What (else) does he have a hundred of?

probably involves the relation between (i) and:

(iv) He has a hundred of those books.

which is beyond the scope of this article.

Other factors than just the presence of *of* must come into play with extraction, since (for me) extraction is not possible in:

(ii) How big of a house did they buy?

(iii) *How big did they buy of a house?

On the other hand, Henry (2001) gives for Belfast English:

(iv) How good has there seemed of a guide to be showing people around?

The role of *of* in making ‘subextraction’ possible appears to have a close counterpart in the case of French *de*, which I will discuss later.

Before turning to French, I mention one additional difference between *little* and *lot*:

(174) John looks a little/*a lot unhappy.

The structure with *a little* + adjective must be:

(175) ...a little AMOUNT unhappy

For unclear reasons, English does not allow:³⁹

(176) *John looks (too) little unhappy.

French does allow *peu* (‘little’) to precede an adjective (cf. Italian (148)):

(177) Jean est peu malin.

Jean is little smart

Curiously, despite (176), English allows the comparative:

(178) John looks less unhappy than Bill.

with, if I am correct, the analysis (cf. in part Bresnan (1973, 277)):

(179) ...-ER little AMOUNT unhappy

The same extra possibility with the comparative is found with *much*:

(180) *John looks/doesn’t look (too) much intelligent.

(181) John looks/doesn’t look more intelligent than Bill.

39. The following:

(i) those (*a little) unhappy children

suggests that the constituent structure of *a little unhappy* might be:

(ii) a [little unhappy]

in which case English does allow ‘little AMOUNT’ to modify an adjective, but (unlike French and Italian) requires it to be preceded by *a*.

The contrast:

(iii) *John is much intelligent.

(iv) ...too much so, in fact.

indicates that this *so* is not an adjective (see Corver (1997, 160) (vs. his p.128)), as also suggested by:

(v) ...enough so to...

(vi) ...*so enough to...

and by:

(vii) a big enough room

(viii)*a so enough/enough so room

with the analysis:⁴⁰

(182) ...-ER much AMOUNT intelligent

2. Mostly French

2.1. French *de as parallel to English of*

French does not have preposition-stranding in Wh-constructions in general, or with pseudo-passives, so it is not surprising that French disallows a direct counterpart to (4) and (10):

(183) *Qui admirait-il un portrait de?
 who admired-he a portrait of

(I take this preposition-stranding difference between French and English to be orthogonal to the present discussion.) The (well-formed) non-Wh counterpart of (183) is:

(184) Il admirait un portrait de Marie.
 he admired a portrait of Marie

with the derivation:

(185) ...admirait [Marie un portrait]	→ merger of K-de
...K-de admirait [Marie un portrait]	→ movement of Marie to Spec,K-de
...Mariei K-de admirait [ti un portrait]	→ merger of de
...de Mariei K-de admirait [ti un portrait]	→ movement of VP to Spec,de
...[admirait [ti un portrait]]j de Mariei K-de tj	

40. A separate question is why (182) is difficult with 'short' adjectives:

(i) ??John is (no) more dumb than Bill.

In (ii), *good* is probably a noun (and there's probably an unpronounced preposition):

(ii) He isn't muchgood at it.

The *much* of *much different* may be the same as that of *much more intelligent*, perhaps derived from (cf. note 32):

(iii) -ER much AMOUNT intelligent BY much AMOUNT

and similarly for *no/any different* and *no/any more intelligent*, e.g.:

(iv) -ER much AMOUNT intelligent BY no/any AMOUNT

with leftward movement of '(BY) *much/no/any* AMOUNT'.

Of importance for what follows is how this kind of derivation carries over to the French counterparts of (1), e.g.:

- (186) Jean a peu d'argent.
Jean has little of.money

Again, there is every reason to think that the *de/d'* of (186) is strongly parallel to English *of*. In other words the derivation of (186) will be:⁴¹

- (187) ...a [argent peu] → merger of K-de
 ...K-de a [argent peu] → movement of argent to Spec,K-de
 ...argenti K-de a [ti peu] → merger of de
 ...de argenti K-de a [ti peu] → movement of VP to Spec,de
 ...[a [ti peu]]j de argenti K-de tj

Given the general unavailability of preposition stranding in French, there is no expectation that this derivation could fit into a longer one involving preposition stranding. Put another way, the strong parallel between the derivations of (14) and (187) is not called into question by the contrast:

- (188) What does he have lots of?
 (189) *Qu'a-t-il peu de?
 what.has.he little of

2.2. 'QP' movement in French

Despite not allowing (189), French does allow extraction of a sort that's not present in English:

- (190) Jean a beaucoup/peu/trop acheté de livres cette année.
Jean has lots/few/too(many) bought of books this year
 (191) *John has lots bought of books this year.
 (192) *John has few bought books this year.

41. A fuller presentation would have AMOUNT following *peu* in each line of (187), assuming *peu* to be a direct (adjective) counterpart of *few/little*.

The alternative would be to take *peu* to correspond rather to English *bit*, i.e. to be a noun (like English *lot* - (165)ff.). This is made conceivable by the absence of any comparative form in French corresponding to *fewer*, and by the existence of *un tout petit peu* if that matches a *very little bit*. On the other hand, the absence of *de* in *trop peu* ('too few/little') strongly suggests that *peu* is an adjective, since nouns in French require *de* consistently - see (33).

In French, *beaucoup/peu/trop* can appear displaced from the object phrase that they go with; in English that is not possible.

There is clearly no exact parallelism between the apparent subextraction in (190) and that in (188). However, there is an important point of similarity that can be seen by taking the adjective counterpart of (13):

(193) ??Houses he's made lots of unstable (by weakening the foundations).

This contrasts with:

(194) Houses he's made lots of.

The deviance of (193) is almost certainly due to the same factors at work in (13) - the VP-preposing step seen at the end of (14) makes the adjective non-final,⁴² so to reach (193) something extra must be done that is evidently not cost-free.

The deviance of (193) has what I take to be a clear counterpart in French:⁴³

(195) ??Jean a beaucoup rendu de filles malheureuses.
 Jean has lots made of girls unhappy

which contrasts with:

(196) Jean a rendu beaucoup de filles malheureuses.

The pre-predicate subject of a small clause resists this quantifier displacement in French in (195) for the same reason that a pre-predicate small clause subject resists preposition stranding in English in (193). The question is, how can this similarity between (193) and (195) be expressed?

Since the deviance of (193) is tied up with the application of VP-preposing and since this VP-preposing is, as seen in (14) and (187), triggered by VP-external *de*, a natural proposal is:

(197) The *de* of (190) is necessarily VP-external.

In other words, although *de* may be able to be DP-internal in (186) and (196), it must be VP-external whenever, as in (190) or (195), it occurs separated from its associated quantifier. VP-external merger of *de* will permit (190) (but will not fully permit (195), for the reasons mentioned). The non-displaced version of (190) (which is perfectly acceptable):

(198) Jean a acheté beaucoup/peu/trop de livres.
 Jean has bought lots/little/too(many) of books

may contain a constituent *beaucoup/peu/trop de livres*, but (190) must not.

42. It remains to be understood why (i) is not perfectly acceptable, either:

(i) ?Houses he's made unstable LOTS of.

43. On (195), see Mouchaweh (1984; 1985).

The derivation of (190) cannot simply be as in, for example, (199) (although (199) will be part of the correct derivation):

- (199) ...acheté [livres peu] → merger of K-de
 ...K-de acheté [livres peu] → movement of livres to Spec,K-de
 ...livresi K-de acheté [ti peu] → merger of de
 ...de livresi K-de acheté [ti peu] → movement of VP to Spec,de
 ...[acheté [ti peu]]j de livresi K-de tj

This derivation produces the desired result that *peu de livres* is not a constituent, but if stopped here it leaves *peu* in a position following the past participle *acheté*, whereas in (190) *peu* precedes *acheté*.

2.3. *QP movement as remnant movement*

Let me propose, then, that subsequent to VP-movement to Spec,*de* French allows the phrase '[ti peu]' to move out of the VP to a position to the left of the past participle:⁴⁴

- (200) ...[ti peu]k [acheté tk]j de livresi K-de tj

Since the phrase '[ti peu]' contains a trace not bound by anything within that phrase, this movement of '[ti peu]' is, like that of the VP in (199), an instance of remnant movement in the sense of den Besten and Webelhuth (1987; 1990) - see also Starke (2001) on *combien* (to be discussed below).

That remnant movement must come into play here follows from the fact that in the derivation (199)/(200) movement of *livres* to Spec,K-*de* takes place prior to movement of the phrase containing *peu*. This in turn reflects the idea that movement to Spec,K-*de* is a Case-licensing form of movement, that movement of (the phrase containing) *peu* is a scrambling or focus or quantifier type of movement, and that Case-licensing heads enter the derivation prior to the heads that license scrambling or focus or quantifier movement.⁴⁵

The analysis proposed for (190) uses remnant movement in the way indicated. One might wonder whether French just happened to choose this particular analysis (assuming its correctness), as opposed to what might at first glance seem like a straightforward alternative, namely having extraction of *peu* from within a larger phrase *peu de livres*.

44. Although I have represented the VP with V preceding the object, it could be the reverse at the relevant point in the derivation, thinking of (a generalized version of) Larson (1988); that might fit better with Chomsky's (2001, 13) PIC.

Strictly speaking, *peu* in these derivations is really '*peu* NUMBER'.

45. See Koopman and Szabolcsi (2000, 131).

Ideally, the learner of French need not choose at all, if the remnant movement analysis is the only one made available by UG. The reason(s) might be, on the one hand, that *peu de livres* is not a possible constituent, i.e. that *de* is never DP-internal, always VP-external, and on the other, that even if *peu de livres* is a possible constituent, VP-external specifier⁴⁶ landing sites are not available to non-argument QPs.⁴⁷

2.4. Past participle agreement

I note in passing that there are past participle agreement facts that seem more favorable to the remnant movement analysis proposed here than to a subextraction approach to (190). Although some French speakers don't have past participle agreement with objects at all, others do. One of those for whom it is natural is Viviane Déprez, who has the following judgments:

- (201) Il a repeint/*repeintes des bagnoles cette année.
 he has repainted of.the cars this year

When the object *des bagnoles* follows the past participle, as in (201), agreement (represented by *-es*) is impossible. On the other hand, she has:

- (202) ?Il a tant repeintes de bagnoles cette année que...
 he has so-many repainted of cars this year that...

In (202), agreement is appreciably more acceptable for her than in (201). From a remnant movement perspective, this can be attributed to agreement with the preposed phrase '[tant t(bagnoles)]' containing a trace/copy of *bagnoles*, a feminine plural noun.⁴⁸

46. I assume that a head movement analysis for *peu* is implausible, in part because it is really 'peu NUMBER', in part because one can have:

- (i) Il a très peu gagné d'argent.
 he has very little earned of.money

with *très peu* clearly phrasal, in part because of (217) below and in part for reasons of locality - see Starke (2001).

The impossibility of an interrogative 'in situ' counterpart to (200), namely (cf. Kayne (1975, §1.5)):

- (ii) *Jean a combien acheté de livres?
 Jean has how-many bought of books

needs to be rethought from the perspective of Pollock, Munaro and Poletto (1999), in which French (apparent) wh-in-situ actually involves Wh-movement.

47. In turn related to the possibility that adverbs in specifier positions are all hidden DP/PPs, e.g. *often* is really *oftentimes/many times* - cf. Katz and Postal (1964, 141), Emonds (1976, 156) and Déchaine and Tremblay (1996). Integration with Cinque (1999) would need to be worked out.

The movement of 'bare' *peu* might in addition be excludable à la Cinque (1990), if the empty category (/copy) left behind could not fit into a proper classification/interpretation of empty categories.

48. On the sensitivity of past participle agreement to whether or not the object has been preposed, see Kayne (2000, chaps. 2 and 3), Obenauer (1994, 165-215) and Déprez (1998).

From a subextraction perspective, on the other hand, all that is preposed in (202) is the bare quantifier *tant* (i.e. ‘*tant* NUMBER’), which has no phi-features of its own, and in fact in French can never even display any via agreement:

(203) *Il a tantes repeintes de bagnoles...

(204) *Il a repeintes tantes de bagnoles...

The (marginal) past participle agreement seen in (202) would thus be harder to understand than under the remnant movement hypothesis.

2.5. *The blocking effect of prepositions*

A remnant movement approach to (200) that is based on a VP-external *de* differs from a subextraction approach in the way it interprets the blocking effect of prepositions, illustrated in:

(205) Jean a souri à peu d’enfants.
Jean has smiled at few of children

(206) *Jean a peu souri à d’enfants.

In Kayne (1981) I had accounted for the contrast between (190) and (206) in ECP terms, taking there to be an empty QP in both, with that empty QP properly governed by the verb in (190) but not properly governed by either the verb or the preposition in (206).

From the present perspective, the question is why the following derivation, which tracks (199)/(200), does not result in an acceptable sentence:

- | | |
|--|--|
| (207) ...souri à [enfants peu] | → merger of K-de |
| ...K-de souri à [enfants peu] | → movement of enfants to Spec,K-de |
| ...enfantsi K-de souri à [ti peu] | → merger of de |
| ...de enfantsi K-de souri à [ti peu] | → movement of VP to Spec,de |
| ...[souri à [ti peu]]j de enfantsi K-de tj | → movement of ‘[ti peu]’ out of VP to the left |
| ...[ti peu]k [souri à tk]j de enfantsi K-de tj | |

The less than perfect status of (202) for Déprez might be related to the indefiniteness of the preposed object.

Some speakers who have past participle agreement reject (202). There might be a correlation with whether or not they accept past participle agreement with clitic *en*.

I think that the answer lies in the last step, which arguably constitutes a preposition stranding violation of exactly the sort found in:

- (208) *Qui as-tu souri à?
 who have.you smiled at

In (208) *qui* has been moved away from *à*; in (206)/(207) it is '[tj peu]' that has been moved away from *à* in parallel fashion, with a equally unacceptable result in both cases.⁴⁹

Qui and *peu* (more exactly '[tj peu NUMBER]') differ, on the other hand, in that the pied-piping counterpart of (208) is straightforwardly acceptable:

- (209) A qui as-tu souri?

whereas the pied-piping counterpart of (206)/(207) is, for almost all speakers, not:⁵⁰

- (210) *Jean a à peu souri d'enfants.

This is not a property specific to ...*peu...de...*, to judge by the following:

- (211) *Jean n'a compris rien.
 Jean NEG.has understood nothing

- (212) Jean n'a rien compris.

- (213) Jean n'a pensé à rien.
 Jean NEG.has thought to(of) nothing

- (214) *Jean n'a à rien pensé.⁵¹

Non-prepositional object *rien* moves leftward obligatorily (in the absence of modification), for all speakers.⁵² Comparable movement of prepositional object *rien* is generally rejected. However, I have come across one speaker (Léna Baunaz) who accepts (214) and also accepts at least some sentences like (210).

More specifically, she finds acceptable (with a certain intonation contour, including stress on the quantifier word):

- (215) Il avait à trop répondu de lettres ce jour-là pour...
 he had to too-many answered of letters that day-there to...

49. Preposition stranding itself now needs to be reinterpreted in non-government terms, a task beyond the scope of this paper.

50. See, e.g., Milner (1978b, 100).

51. In literary French there are some examples resembling (214) that are fairly acceptable - see Kayne (1975, chap.1, note 81).

52. See Kayne (1975, §1.6).

- (216) Il avait à énormément téléphoné de copains.
 he had to enormously(many) telephoned of friends
- (217) Le comité était à très peu parvenu de compromis.
 the committee was to very few reached of compromises
- (218) Il s'était à beaucoup adressé de collègues.
 he REFL.was to many adressed of colleagues

Although these are not as 'easy' for her as:

- (219) Il avait à rien pensé de drôle depuis un moment.
 he had to(of) nothing thought of funny for a while

the fact that they are acceptable to her is striking.

2.6. *combien*

It is not, however, entirely unfamiliar. Obenauer (1976) studied in detail the interrogative counterpart of (190):

- (220) Combien a-t-il acheté de livres?
 how-many has.he bought of books

He noted (p.11ff.) that if *combien* is preceded by a preposition, the sentence is often rejected, but sometimes accepted:

- (221) A combien s'est-il adressé de gens heureux?
 to how-many REFL.is.he addressed of people happy
- (222) A combien a-t-elle souri de garçons?
 to how-many has.she smiled of boys

These interrogative examples are more widely accepted than (215)-(218). (I suspect that the difference is related to the higher landing site with interrogatives.⁵³)

53. There may be a (yet to be explained) parallel with (English) preposition stranding - see Kayne (2000, 39).

Both subtypes are possible (to some extent) with other prepositions. Obenauer (1976, 11) gives as '??' (vs. '?' for (221)-(222)):

- (i) Sur combien faut-il pouvoir compter de personnes?
 on how-many is.necessary.it to.be.able to.count of persons

And Léna Baunaz accepts:

- (ii) Il avait sur beaucoup tiré de lapins ce jour-là.
 he had at many shot of rabbits that day-then

If there is in addition to the PP a direct object, the result in both subtypes is sharply impossible if the direct object intervenes:

The acceptability of both types (even though limited) is notable, since it looks at first glance as if they must, for those who accept them, be an instance of movement of a non-constituent, i.e. to take just two of the examples, it looks like there must be movement of *à très peu* in (217) out of a phrase ‘[*à très peu de compromis*]’; similarly it looks like there must be movement of *à combien* in (222) out of a phrase ‘[*à combien de garçons*]’.

Starke (2001) has proposed, however, that sentences like (221)-(222) are not that at all, but rather instances of remnant movement. (His proposal converges with one made by Androutsopoulou (1997) for Greek sentences that I think are close to these.)

From the present perspective, with *de* VP-external in all of (220)-(222), the derivation of (220) would look like:

- (223) ...acheté [livres combien] → merger of K-de
 ...K-de acheté [livres combien] → movement of livres to Spec,K-de
 ...livresi K-de acheté [ti combien] → merger of de
 ...de livresi K-de acheté [ti combien] → movement of VP to Spec,de
 ...[acheté [ti combien]]j de livresi K-de tj → Wh-movement out of VP
 [ti combien]k...[acheté tk]j de livresi K-de tj

Wh-movement moves *combien* together with the trace of *livres*.⁵⁴

The derivation of (222) is now:

(iii) *A combien a-t-il montré son article de collègues
 to how-many has-he shown his article of colleagues

(iv) *Il avait à beaucoup montré son article de collègues.
 he had to many shown his article of colleagues

If *de collègues* precedes *son article*, there is some improvement in both (see Obenauer (1976, 74); also Androutsopoulou (1997, 26) on Greek), for unclear reasons.

The impossibility of (iii)/(iv) recalls the fact that French ‘stylistic inversion’ can usually not produce ‘V O S’ where O is a lexical direct object - see Kayne and Pollock (2001, §16). The parallelism is supported by the observation that there is substantial improvement if the object is idiomatic:

(v) A combien a-t-il rendu hommage de collègues.
 to how-many has.he rendered hommage of colleagues

54. Fanselow and Cavar’s (2001) approach to remnant movement has in common with this the movement of a ‘large’ constituent, but differs in that it uses selective deletion, rather than prior extraction of a subpart.

Luigi Rizzi (p.c.) points out that a remnant movement analysis of these *combien* sentences will require rethinking the intervention and weak island effects discussed by Obenauer (1984; 1994, chapter 2), Rizzi (1990, 12ff.) and Starke (2001).

- (224) ...souri à [enfants combien] → merger of K-de
 ...K-de souri à [enfants combien] → movement of
 enfants to
 Spec,K-de⁵⁵
 ...enfantsi K-de souri à [ti combien] → merger of de
 ...de enfantsi K-de souri à [ti combien] → movement of VP
 to Spec,de
 ...[souri à [ti combien]]j de enfantsi K-de tj → Wh-movement
 [à [ti combien]]k...[souri tk]j de enfantsi K-de tj⁵⁶

In the last step, *à combien* is pied-piped along with the trace of *enfants*.⁵⁷ This remnant movement derivation does not require movement of a non-constituent.

55. Note that this must not count as an instance of preposition stranding.

Why this type of sentence is not equally acceptable to all speakers remains to be understood. (There might be a link to the judgments Milner (1978b, 156n) reports for right-dislocation.)

What is moved in this step in (224) is the NP *enfants*. This distinguishes (222) from:

- (i) *De quel livre a-t-elle souri à l'auteur?
 of what book has-she smiled at the-author

on which, see Kayne (1975, §2.8, §2.10).

56. If Wh-movement moved '[ti combien]' in the last step without moving *à*, we would have a preposition stranding violation exactly as in (206) (and (208)):

- (i) *Combien a-t-elle souri à d'enfants?
 how-many has.she smiled at of.children

57. (224) contains an oversimplification, thinking of Kayne (2001), where *à* itself is argued to be a VP-external probe. A fuller derivation would be:

- (i) ...souri [enfants combien] → merger of K-à
 ...K-à souri [enfants combien] → movement to Spec,K-à
 ...[enfants combien]i K-à souri ti → merger of à
 ...à [enfants combien]i K-à souri ti → movement of VP to Spec,à
 ...[souri ti]j à [enfants combien]i K-à tj

At this point K-de comes in:

- (ii) ...K-de [souri ti]j à [enfants combien]i K-à tj → movement of *enfants* to Spec,K-de
 ...enfantsk K-de [souri ti]j à [tk combien]i K-à tj → merger of *de*
 ...de enfantsk K-de [souri ti]j à [tk combien]i K-à tj → movement to Spec,de
 ...[[souri ti]j à [tk combien]i K-à tj] de enfantsk K-de tl

At this point, Wh-movement pied-pipes the phrase '[à [tk combien]i K-à tj]'.

Two points worth mentioning are: First, the phrase moved to Spec,de is headed by *à*, i.e. is not a VP. Second, the phrase pied-piped by Wh-movement is not a maximal projection unless '[souri ti]' has moved to some higher Spec in the transition from (i) to (ii) (Koopman and Szabolcsi (2000) may be relevant).

An alternative would be to reinterpret prepositional pied-piping in terms of a high merger of the preposition - see the appendix to Kayne (2001). That would mean a derivation for (222) like:

Starke's point about remnant movement clearly carries over to (215)-(218), e.g. the derivation of (217) would be (with *de* VP-external):

- (225) ...parvenu à [compromis très peu] → merger of K-*de*
 ...K-*de* parvenu à [compromis très peu] → movement of
 compromis to
 Spec,K-*de*
 ...compromisi K-*de* parvenu à [ti très peu] → merger of *de*
 ...*de* compromisi K-*de* parvenu à [ti très peu] → movement of VP
 to Spec,*de*
 ...[parvenu à [ti très peu]]*de* compromisi K-*de* *tj* →
 [à [ti très peu]]*k*...[parvenu *tk*]*j* *de* compromisi K-*de* *tj*

The 'splitting' of the PP seen in (215)-(218) and (221)-(222) is, given the derivations (224) and (225), essentially due to the movement (out of the PP) of the NP *enfants/compromis* to Spec,K-*de*. If we ask what motivates this NP movement, the answer, from the perspective of the analysis being pursued, is Case. French *combien* and *très peu*, etc. block Case-valuation from applying simultaneously to them and to their sister constituent. Therefore K-*de* must appear; the movement of the NP to Spec,K-*de* is essential if the sentence is not to violate Case requirements. Since that Spec,K-*de* is VP-external, we get the effect of splitting.

In Italian, the counterparts of *combien* and *peu* do not take a preposition before the NP:

- (226) Quanti (*di) libri hai comprato?
 how-many of books have-you bought
- (227) Hai comprato pochi (*di) libri.
 you-have bought few of books

-
- (iii) *souri* [enfants combien] → merger of K-*de*
 K-*de* *souri* [enfants combien] → movement of *enfants* to Spec,K-*de*
enfantsi K-*de* *souri* [ti combien] → merger of *de*
de *enfantsi* K-*de* *souri* [ti combien] → movement of VP to Spec,*de*
 [*souri* [ti combien]]*j* *de* *enfantsi* K-*de* *tj* → merger of subject and aux
 (plus inversion)
as-tu [*souri* [ti combien]]*j* *de* *enfantsi* K-*de* *tj* → merger of K-*à*
 K-*à* *as-tu* [*souri* [ti combien]]*j* *de* *enfantsi* K-*de* *tj* → movement of '[ti combien]' to
 Spec,K-*à*
 [ti combien]*k* K-*à* *as-tu* [*souri* *tk*]*j* *de* *enfantsi* K-*de* *tj* → merger of *à*
 [ti combien]*k* K-*à* *as-tu* [*souri* *tk*]*j* *de* *enfantsi* K-*de* *tj*

Again, no recourse to non-constituent movement would be necessary.

The derivation in (iii) abstracts away from questions about Wh-movement - see Pollock, Munaro and Poletto (1999) - that may be relevant to the tension between (iii) and the proposal in Kayne (2000, 292, 322) concerning the obligatory filling of functional Specs.

In our terms, this means that Italian does allow simultaneous Case-valuation here, e.g. of *pochi* and *libri* in (227). In the consequent absence of *K-di*, the French-type derivation is not available, and the (correct) expectation is therefore that splitting will not be possible in Italian:

(228) **Quanti hai comprato libri?*

Things are a bit more complex, however, since Modern Greek allows splitting in the absence of a preposition corresponding to French *de*, even when what is split is a PP, much as in (221)-(222).

One example from Androutsopoulou (1997, 30) is:

(229) *Me to BLE eghrapsa molivi (ohi me to kokkino).*
with the BLUE I-wrote pencil (not with the red)

The derivation she proposes seems correct - the NP *molivi* scrambles out of the PP *me to BLE molivi*; subsequently the PP '[*me to BLE t(molivi)*]' containing the trace of *molivi* preposes by focus movement.

The question is why Greek allows this scrambling step, but not Italian. Greek has morphological Case on lexical DPs, and Italian does not. Nor does Bulgarian, yet some Bulgarian allows (some) sentences like (229) (Steven Franks and Roumyana Pancheva (p.c.)):

(230) *Na TOZI sedjah stol.*
on THIS I-sat chair

It remains unclear whether this Italian vs. Greek/(some)Bulgarian difference has to do with DP-internal syntax (transparency to extraction; or internal structure as in (159)) or with the availability of a scrambling landing site in the latter, but not in Italian.⁵⁸

2.7. More on remnant movement of *peu*

Returning to the preceding derivations, we see that the movement step indicated in the last line of (224) is simply *wh*-movement of a familiar sort. More interesting is the last movement step in (225) and similarly in (199)/(200). Why does *peu* in French move leftward, even if modified by *très*, and even (for Léna Baunaz) if preceded by a preposition.

Part of the answer may be that the movement of *peu* (similarly *beaucoup*, *trop*, *énormément* and others) is akin to the movement of *rien* seen in:

(231) *Jean n'a rien acheté.*
Jean NEG.has nothing bought

58. Note that Italian must not have an unpronounced counterpart of French *de*. In addition, Catalan may show that having *de* is not sufficient to allow splitting of the French sort, in particular when *de* cooccurs with ϕ -feature agreement, as it can in Catalan - see Martí Girbau (2001), whose correlation between the presence of *de* (in *molts (de) llibres* ('many of books')) and non-specificity might be interpretable in terms of splitting vs. non-splitting.

Moved *rien* can be modified:

- (232) Jean n'a absolument/presque rien acheté.
 Jean NEG.has absolutely/almost nothing bought

and for Léna Baunaz can be preceded by a preposition, as noted earlier in (219). The movement of *rien* does not find a parallel with lexical negative phrases:⁵⁹

- (233) Jean n'a acheté aucun livre.
 Jean NEG.has bought no book

- (234) *Jean n'a aucun livre acheté.

In what looks like exactly the same way, moved *peu* cannot be accompanied by a noun (contrasting with (190)):⁶⁰

- (235) *Jean a peu de livres achetés.
 Jean has few of books bought

The commonality of this restriction is emphasized by:

- (236) Jean n'a rien acheté d'intéressant.
 Jean NEG.has nothing bought of interesting'

- (237) *Jean n'a rien d'intéressant acheté.

especially if (236) involves remnant movement (parallel to (199)/(200)), as in:

- | | |
|--|--|
| (238) ...acheté [intéressant rien] | → merger of K-de |
| ...K-de acheté [intéressant rien] | → movement of
intéressant to
Spec,K-de |
| ...intéressanti K-de acheté [ti rien] | → merger of de |
| ...de intéressanti K-de acheté [ti rien] | → movement of VP
to Spec,de |
| ...[acheté [ti rien]]j de intéressanti K-de tj | → movement of rien
out of VP |
| ...[ti rien]k...[acheté tk]j de intéressanti K-de tj | |

59. Why the Icelandic counterpart of (234) is grammatical (and usual) in contrast to French remains to be understood.

The French pattern recalls Cinque (1990) on bare quantifiers, though 'bare' must now be reinterpreted to accommodate remnant movement.

60. There may be a link here to:

- (i) J has carefully/??with care described it to them.
 (ii) J has frequently/often/?twice/*many times/*five times gone there for his vacation.

It should be said that movement of *rien* and movement of *peu* differ somewhat in that movement of *rien* is essentially obligatory:

(239) *Jean n'a acheté rien.

and preferred even in cases like (236):

(240) ?Jean n'a acheté rien d'intéressant.

whereas non-movement of *peu* seems fully acceptable:

(241) Jean a acheté peu de livres.

Conversely, while (231) is fully acceptable without hesitation to all French speakers (that I have ever asked), movement of *peu*, as in:

(242) Jean a peu acheté de livres.

is more 'delicate' in a way that's hard to pin down.⁶¹ This recalls the fact that Icelandic negative phrase movement is more robust than the movement of other quantified phrases (see Svenonius (2000)), and suggests that despite the parallelisms mentioned, the movement of *rien* and that of *peu* might not be triggered in exactly the same way, and might not, thinking of Cinque (1999), have exactly the same landing site.⁶²

This bears in turn on a long-standing question concerning the relation between (242) and instances of adverbial *peu*, as in:

(243) Jean a peu apprécié ta communication.
Jean has little appreciated your talk

I take a non-movement adverbial approach to (242) of the sort considered in Kayne (1975, §1.5) (using a non-movement mechanism that in fact mimics movement) to be undesirable (from a derivational perspective) on grounds of theoretical redundancy. In addition, the parallel with adverbs is not perfect. For example, Viviane Déprez (p.c.) finds passably acceptable:

(244) (?)Elle a tout plein acheté de bouquins.
she has all full bought of books

but a comparable position for adverbial *tout plein* is very marginal for her (cf. Doetjes (1997, 178)):

61. See Grevisse (1993, §295) and Milner (1978b, 98).

62. Relevant is Milner (1978b, §2.3.3) on the (in)compatibility of moved *peu* (and similar elements) with various types of adverbs.

The movement of '[ti peu]' in (242) might well be expected to correlate with interpretive effects - for relevant discussion, see Obenauer (1983, 82; 1994, 111ff.), Doetjes (1997, chapter 10) and Vinet (2001, 85ff.). Some of the psych-verb restrictions discussed by Obenauer might fall out from the object being prepositional - see Landau (2001); others recall Landau (1999) on restrictions on possessive datives.

- (245) ??Elle a tout plein rigolé.
 she has all full had-fun

The remnant movement approach that I have been pursuing is compatible with these facts.⁶³

2.8. Conclusion

In conclusion, many instances of French *de* ('of') and English *of* that look DP-internal can be reanalyzed as being VP-external. What looks like movement of bare 'quantifiers' such as *peu* ('few'/'little') turns out to be remnant movement (as Androutsopoulou (1997) had proposed for Greek and Starke (2001) for interrogative *combien*). In many cases there is reason to postulate the presence of an unpronounced AMOUNT/NUMBER and/or an unpronounced MUCH/MANY, both in French and in English.

The Case filter should apply to all +N elements, much as Emonds (2000) had suggested. In particular, each +N subpart of DP must get its own Case, sometimes in a way that parallels Chomsky's (2001, 18) discussion of participles. This leads to the proposal that (non-head) phrases never have Case.

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63. (Non-remnant) movement is explicitly argued for by Milner (1978a, 690-692), non-movement by Doetjes (1997, chapter 10).

Whatever triggers the movement of *peu* (and of *tout plein* in (244)) must not allow:

- (i) *J'ai un million lu de livres.
 I.have a million read of books

which contrasts for Isabelle de Crousaz with:

- (ii) Il avait un peu acheté de chocolat pour lui faire plaisir.
 he had a little bought of chocolate to him/her make pleasure

(Obenauer (1983 p.80) had found a fairly similar example to be impossible.)

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