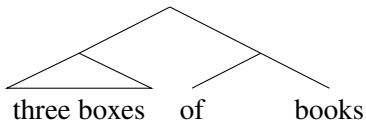
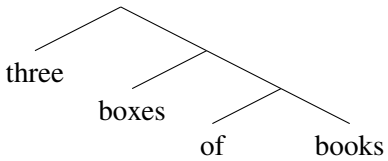
Recursion in NP: pseudopartitive measures require complementation, not specification

I aim here to provide evidence favoring one of two hypotheses regarding the structure of measure phrases in pseudopartitives (*three boxes of books*). I will call hypothesis-(1a) the 'Spec' hypothesis (Schwarzschild, 2006), and hypothesis-(1b) the 'Comp' hypothesis (Stickney, 2009). Only the latter requires nominal complements to nominals (recursion inside NP, which has been more controversial than clausal recursion – see Stowell, 1989; Frank and Kroch, 1994; Frank, 2002; Chomsky, 2008; Kayne, 2008; Citko, 2014).

(1) a.



b.



I argue that patterns of extraction from NP (both leftward Ā-movement and extraposition) support the Comp-hypothesis, suggesting also that the grammar forces some cyclicity inside NP (*pace* Frank, 2002).

Background: In general, extraction out of NPs is no less acceptable when specifiers increase in complexity (2). But increasing the depth of embedding can lead to worse and worse degradation (3).

(2) What did you enjoy [$_{\text{NP}}$ [$_{\text{Spec}}$ the editor (of John's college newspaper)]'s review of t_1]

(3) What did you enjoy [$_{\text{NP}}$ a film about (? a painting of (?? a facsimile of)) t_1]

The Spec hypothesis predicts that extraction from NPs with multiple measure phrases should be like (2). The Comp hypothesis predicts that it should be like (3). The latter is supported by the evidence.

The argument from leftward movement: The Spec-hypothesis treats multiple complex measure phrases *three boxes of folders* as complex left branches, as in (4).

(4) [$_{\text{NP}}$ [$_{\text{Spec}}$ *three boxes of folders*] [of [$_{\text{NP}}$ documentation [$_{\text{PP}}$ about NP$_i$]]]]

Extraction out of a definite is harder than extraction out of an indefinite (Davies and Dubinsky, 2003, Chomsky, 2007, i.a.). With complex measure phrases, each instance of *the* degrades the sentence further.

(5) The journalist exposed the scandal
which the government buried [(??the) three boxes of [(??the) folders of [reports about *t*]]].

This means extraction from *three boxes of folders* is more like (3) than (2). This is in line with the Comp hypothesis, which can say that the middle measure phrase *folders of* is a stopping off point for successive cyclic movement.

The Spec hypothesis does not allow this, and assumes (5) is like the structure in (6).

(6) the scandal [which$_1$ the government buried [[$_{\text{Spec}}$ (three boxes (of folders)] of) reports about t_1]] (✗)

The argument from extraposition: Much work argues that nouns modified by Q(uantity)-adjectives like *many, few, most*, etc. have the structure of pseudopartitives (Jackendoff, 1968; Bresnan, 1973, Schwarzschild, 2006, Rett, 2014; Solt, 2015; Wilson, 2018, i.a.). Extraposition is generally possible out of these (Selkirk, 1977; Stickney, 2009).

(7) Tim has been going to the library every day this week, and borrowing a lot of books.

a. He borrowed many books about the English Civil War yesterday.

b. He borrowed many books t_1 yesterday [about the English Civil War]$_1$.

When the Q-adjective modifies another measure phrase, as in *many boxes of books*, the Spec-hypothesis assigns the nominal the structure in (8a), and the Comp-hypothesis assigns it (8b).

(8) a. [$_{NP_1}$ [$_{NP_2}$ many boxes] [of books [$_{PP}$ about the English Civil War]]]

b. [$_{NP_1}$ many [$_{NP_2}$ boxes [of books [$_{PP}$ about the English Civil War]]]]

Movement of the PP would cross two NP boundaries in (8b) but only one in (8a). Given that extraposition is bounded to the next cycle up (Ross, 1967), the Spec hypothesis predicts extraposition should be as possible out of *many boxes of books* as it is out of *many books*. The Comp hypothesis predicts that extraposition should be unacceptable, as it would have to cross two NP boundaries. The latter prediction holds.

(9) Tim bought [many (??boxes of) books t_1] yesterday [about the English Civil War]$_1$.

We see that extraposition out of *many boxes of books* is degraded, unlike extraposition out of *many books*. The contrast supports the Comp-hypothesis, which assigns *many boxes of books* an [$_{NP}$ N [... NP]] structure.

The semantic motivation for the Spec-hypothesis: Schwarzschild (2006) identifies two positions for measure phrases. He calls the (a)-positions 'attributive' and the (b)-positions 'partitive', and notes that the ability of a measure phrase to occur in one position (10) often entails the inability to occur in the other (11).

(10) a. a ring made of 18 karat gold b. a ring that contains 6 ounces of gold

(11) a. *a ring that contains 6 ounce gold. b. *a ring made of 18 karats of gold.

He notes a generalization, where monotonicity means 'when one ordering tracks another ordering':

(12) When a measure phrase is [in the] partitive, the interpretation is one in which the dimension is monotonic on the relevant part-whole relation in the domain given by the noun [i.e. ounces tracks amount of gold; purity does not].

He encodes this by forcing partitive measure phrases into [Spec, MonP] (headed by *of*), and having Mon^0 force monotonicity on the relation between the denotations of its Spec and its Comp, allowing a perspicuous implementation of the linking generalization in (12). To the extent that the arguments above are correct, this must be achieved by a different syntactic implementation, and cannot simply be coded into the semantics of a functional head 'Mon'. Rehabilitating this generalization can be done by placing constraints on the interpretation of measure functions directly (cf. Wellwood, 2019), rather than on their syntactic distribution.

Conclusion: I have argued for (1b) over (1a) as the correct description of the constituent structure of pseudopartitives. The Spec-hypothesis was motivated by a constraint on the interpretation of (pseudo)partitives ('monotonicity'; Schwarzschild, 2006). But there is no reason to think that our encoding of the monotonicity requirement must be committed to one syntactic implementation, i.e., the (1a)-implementation. I have called attention to syntactic facts which push in favor of the Comp-structure: i) measure phrases show successive-cyclicity effects in extraction, and ii) they bound extraposition, suggesting extraposition would require subextraction from two cycles.

Pseudopartitive measure phrases provide evidence for recursion and cyclicity within the nominal domain, which has remained controversial in recent syntactic theory.

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