

On Measure Phrase Alternation and Smuggling

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1. Introduction

Word order alternation is a core property of human language. The active-passive alternation, exemplified in (1), is a well-known case, as is the Dative alternation exemplified in (2):

- (1) a. John_{agent} kissed her_{theme}. (active construction)
b. She_{theme} was kissed by John_{agent}. (passive construction)
- (2) a. John gave Sue_{goal} a book_{theme}. (double object construction)
b. John gave a book_{theme} to Sue_{goal}. (prepositional dative construction)

From a surface perspective, the alternations in (1) and (2) display the following similarities: Firstly, a noun phrase carrying semantic role *X* —*agent* in (1), *goal* in (2)— is "bare" (i.e., preposition-less) in the a-examples but "dressed" (i.e., preceded by a preposition) in the b-examples. Specifically, the agent *John* is bare in (1a), but prepositionally dressed in (1b), and the goal *Sue* is bare in (2a) but prepositionally dressed in (2b). Secondly, the linear order of the two noun phrases in the b-examples is the reverse of the linear order of the two noun phrases in the a-examples. Thus, in (1a), the agent *John* precedes the theme *her*, while, in (1b), the theme *she* precedes the prepositionally dressed agent *John*. As for (2), the goal *Sue* precedes the theme *a book* in (2a), while the latter precedes the dressed goal *Sue* in (2b).

The word order alternation that is the point of focus in this chapter is given in (3). I label this phenomenon *Measure Phrase* (henceforth, MP) *alternation*.

- (3) a. John is [two inches too tall].
b. John is [too tall by two inches].

From a surface perspective, the word order alternation in (3) is quite similar to the alternations in (1) and (2). In the a-example, we find a bare (measure) noun phrase, *two inches*, while in the b-examples we have a prepositionally dressed measure phrase, *by two inches*. Although the linearization of the two nominal expressions, *John* and *two inches*, is the same in (3a) and (3b), it is clear that the linear position of the bare MP and the dressed one differs: the former precedes *too tall*, the latter follows it.

The aim of this chapter is to examine the syntactic properties of English MP alternation. My analysis will adopt a core ingredient of Collins's (2005, 2017) analysis of the active-passive alternation and the Dative alternation, namely his proposal that the bare noun phrase —*John* in (1a), *Sue* in (2a)— has the same base position as the noun phrase following the preposition in the prepositionally dressed pattern —*by* + *John* in (1b), *to* + *Sue* in (2b).¹ For (3), this means that *two inches* in (3a) and *two inches* in (3b) find their origin in the same base position. This obviously raises the question as to how the word order alternation in (3) is derived. Specifically, which order is the base order and which one is the derived one? Again in line with Collins's approach to the alternations in (1) and (2), it will be proposed that the pattern featuring the bare MP (see (3a)) is the base order, while the pattern featuring the

¹ As Collins (2005) notes, the idea that the agent noun phrase in active and passive sentences originates in one and the same base position, has its origin in Chomsky's (1957:42-43, 78-81) approach to the passive construction.

dressed MP (see (3b)) constitutes the derived one. It will be argued that this derived order results from displacement of an adjectival chunk within the eXtended Adjectival Projection (henceforth XAP). Schematically, where the crossed out string represents the base position of *too tall*:

(4) [too tall by two inches ~~too tall~~]

The uniform approach towards word order alternations such as those in (1), (2) and (3) takes the quest for (structural) symmetry as its point of departure. Cross-structurally, the pattern featuring the bare nominal expression is taken to be the base structure, while the pattern featuring the dressed nominal expression (i.e., P + noun phrase) constitutes the derived structure. In this chapter, the quest for symmetry will play a part also in another way. The phenomenon of MP alternation will namely be studied from a cross-categorical perspective. That is, the question will be addressed as to whether this phenomenon is attested in the nominal, verbal/clausal and prepositional domain, besides the adjectival domain. The minimal pair in (5) offers a glimpse into MP alternation in the verbal domain:

- (5) a. *Mary *two years* outlived her husband.
b. Mary outlived her husband *by two years*.

The well-formed pattern (5b) features a prepositionally dressed MP, the ill-formed pattern (5a) a bare one. The question obviously arises as to what underlies this asymmetry in the verbal domain. In addition, the question arises as to what underlies the cross-categorical asymmetry between (3a), on the one hand, and (5a), on the other. That is, why can a bare MP occur in a position preceding *too tall* but not in a position preceding *outlived*? In my answers to these questions, the phenomenon of Smuggling (Collins *ibidem*) comes in. As for the contrast between (5a) and (5b), it will be proposed that the ill-formedness of (5a) is due to a violation of Relativized Minimality (Rizzi 1990). Specifically, a subject noun phrase cannot be moved (to Spec,TP) across an intervening (nominal) MP. The well-formedness of (5b) results from Smuggling: the subject noun phrase moves to Spec,TP after first having been smuggled across MP by a verbal chunk in which MP is embedded. The contrast between (3a) and (5a) will be explained in terms of the locus of the subject noun phrase in the hierarchical organization of the extended projection. Specifically, *Mary* in (5a) starts out in a base position that is hierarchically lower than MP, while *John* in (3a) starts out in a base position structurally higher than MP.

The chapter is organized as follows: Section 2 discusses the constituency of the MP alternation patterns in (3). Section 3 provides a first sketch of the analysis of MP-alternation. It is proposed that pattern (3a) is the base order and pattern (3b) the derived order, where derivation of the latter pattern involves movement of an adjectival chunk within the extended adjectival projection. Section 4 discusses two word order alternations in the clausal domain (active-passive and Verb-Adverb ordering) and summarizes analyses of these alternations that make use of so-called Smuggling. Section 5 discusses MP alternation in the adjectival domain, section 6 MP alternation in the nominal domain, section 7 MP alternation in the clausal domain, and section 8, finally, MP alternation in the prepositional domain. Section 9 is the conclusion.

2. Constituency

In order to find out whether the MP-alternation in (3) and (4) is internal to XAP, one needs to find out whether the strings *two inches too tall* and *too tall by two inches* form syntactic units, that is, constituents. One might, for example, hypothesize that the bare or dressed MP is located in a position external to the adjective phrase but internal to the verb phrase.

A number of data, based on classic constituency tests (Carnie 2008), show that MP occupies a position within XAP. Firstly, the strings *MP too A* and *too A by MP* can be fronted to the beginning of the clause. In other words, they form units that can be input to displacement.

- (6) a. *Two inches too tall* John certainly is!
 b. *Too tall by two inches* John certainly is!

Secondly, the two strings can be substituted for by pro-forms such as *so*, *as* and *it* (the so-called replacement test).²

- (7) a. John is *two inches too tall* and Bill seems *so* too.
 b. John is *too tall by two inches* and Bill seems *so* too.
- (8) a. John was *two inches too tall*, just *as* his brother was.
 b. John was *too tall by two inches*, just *as* his brother was.
- (9) a. John is *too tall by two inches*, although he doesn't look *it*.
 b. John is *two inches too tall*, although he doesn't look *it*.

Thirdly, the strings *MP too A* and *too A by MP* can function as conjuncts in a coordinate structure:

- (10) a. John was [[*two inches too tall*] and [*3 pounds too heavy*]].
 b. John was [[*too tall by 2 inches*] and [*too heavy by 3 pounds*]].

Fourthly, the strings *MP too A* and *too A by MP* can stand alone as a fragment of sentence, such as in an answer to a question.

- (11) Context: A mother (M) tells her friend (F) about her three sons who were not accepted as marines on a submarine because they were all too tall.

M: John was 3 inches inches too tall to serve on a submarine.

F: What was Peter?

M: *2 inches too tall / too tall by 2 inches!*

F: And Ben?

M: *just 1 inch too tall / too tall by just 1 inch!*

Fifthly, the strings *MP too A* and *too A by MP* can be input to a deletion rule that applies to copular constructions such as (12a) and (12b). The symbol \emptyset represents the deleted adjective phrase.

- (12) a. I believed Bill was 3 inches *too tall / too tall by 3 inches*, and he was \emptyset .

² See Ross (1969) for the observation that adjective phrases in English can be replaced by a pronoun (*it*) or an adverbial pro-form (*as*, *so*).

b. Bill was *3 inches too tall / too tall by 3 inches*, wasn't he \emptyset ?

On the basis of the above-mentioned five constituency tests it can be concluded that the strings *two inches too tall* and *too tall by two inches* form constituents.

For the sake of completeness, observe that MP must always be part of the string to which the syntactic operation applies. That is, MP cannot be "stranded". This is exemplified in (13) and (14).

(13) **Too tall* John certainly is (*by*) *two inches*!

(14) *John is *two inches too tall* and Bill seems \langle *four inches* \rangle *so* \langle *by four inches* \rangle .³

(13) shows that the MP cannot be stranded in clause-internal position after the sequence *too tall* has been fronted. (14) shows that *so*-pronominalization must include the MP.

3. Towards a DegP-movement analysis of *too tall by two inches*.

The question arises how to analyze the MP alternation in (3). Specifically, should we adopt two distinct base positions for MPs, one for bare MPs (*two inches too tall*) and one for prepositionally dressed ones (*too tall by two inches*)? Or should we adopt a single base position for bare and dressed MPs? In line with Cinque's (1999, 2004) proposal that adverbial expressions of the same semantic type (e.g., the manner adverbials *carefully* and *in a careful way*) are base-generated in the Spec-position of a designated functional head, I adopt the latter position. Thus, *two inches* in (3a) and (*by*) *two inches* in (3b) occupy the same structural position in XAP. As will be shown later, this position corresponds to the (left branch) specifier of the prepositional head *by*.

If one adopts the single base position for bare and dressed MPs, one of the word order variants must involve displacement. Suppose *too tall by two inches* is the base order, then *two inches too tall* is derived by either leftward movement of MP (with concomitant deletion or non-realization of *by*) or rightward movement of *too tall* (with concomitant deletion or non-realization of *by*). The two options are given in (15)-(16).

(15) *too tall by 2 inches* \rightarrow (~~*by*~~) *2 inches too tall* ~~*by 2 inches*~~ (leftward mvt. of MP)

(16) *too tall by 2 inches* \rightarrow ~~*too tall*~~ (~~*by*~~) *2 inches too tall* (rightward mvt. of *too tall*)

Alternatively, *two inches too tall* is the base order, and *too tall by two inches* is derived by leftward movement of *too tall* (with concomitant insertion of *by*) or by rightward movement of *two inches* (with concomitant insertion of *by*).⁴ These two options are given in (17)-(18).

(17) *2 inches too tall* \rightarrow *too tall by 2 inches* ~~*too tall*~~ (leftward mvt. of *too tall*)

(18) *2 inches too tall* \rightarrow ~~*2 inches*~~ *too tall by 2 inches* (rightward mvt. of MP)

³ '....<A> <A>....!' indicates that A occupies either the first position or the second one.

⁴ See Bowers (1975:540) for an analysis of the minimal pair in (i) in terms of rightward movement of *by far*, and Kayne (2002, note 32) for the suggestion that the word order alternation can be recast in terms of leftward movement of *far*, as in (ii).

- (i) a. John is *far* more intelligent than Bill. (base order)
 b. John is t_i more intelligent *by far* $_i$ than Bill. (derived order)

- (ii) a. John is more intelligent *by far* than Bill. (base order)
 b. John is *far* $_i$ more intelligent BY t_i than Bill (derived order, with BY being a silent P)

For making a choice between the alternative analyses in (15)-(18), I base myself on the subextraction phenomena depicted in (19b-d). Before discussing these examples, I should point out that example (19a) shows that the string *how many inches too tall* can also be moved as a unit (i.e., constituent) to Spec,CP.⁵

- (19) I wonder ...
- a. ... *how many inches too tall* John was (to serve on a submarine).
 - b. ?* ... *how many inches* John was *too tall*.
 - c. ? ... *by how many inches* John was *too tall*.
 - d. ... *how many inches* John was *too tall* *by*.

As shown by (19b), fronting of the bare MP *how many inches* yields an ill-formed sentence. On the contrary, fronting of the dressed MP, as in (19c), yields a quite acceptable sentence. The question mark indicates that pied piping of the preposition is slightly marked. Finally, fronting the bare MP with stranding of the preposition *by* yields a sentence that is acceptable for many speakers of English.

Returning to the word order alternation analyses in (15)-(16) and (17)-(18), let's see what these subextraction phenomena entail for them. With regard to (15), it may be somewhat surprising that displacement of MP to the left periphery of XAP bleeds subextraction of MP (see (19b)). Normally, movement to the left edge of an extended projection feeds subextraction, as for example, in movement out of a clause through Spec,CP. As for (18), rightward movement of PP (i.e. dressed MP) normally yields a freezing effect (Wexler and Culicover 1980, Corver 2017), as in *Whose son_i did you talk <to t_i> yesterday <*to t_i>?*. The acceptability of extraction pattern (19d) therefore suggests that the string *too tall by two inches* is not derived by means of PP-extraposition within XAP. At a more theory-internal level, it should further be noted that rightward movement and rightward adjunction are universally prohibited by Kayne's (1994) Linear Correspondence Axiom (LCA). Let's next consider (16) and (17), which involve rightward and leftward movement of *too tall*, respectively. Rightward movement of the adjectival phrase *too tall* is again prohibited by Kayne's (1994) LCA. This brings us to the last option: leftward displacement of *too tall*, as in (17).

Displacement operations that move an adjectival constituent (a phrase or a head) leftward, as in (17), have been observed in the literature. In Bowers (1987), for example, it is proposed that the attributive XAP *too big* in (20a) occupies a position preceding the indefinite article as a result of movement to Spec,DP, as in (20b); see also Kennedy and Merchant 2000, Troseth 2009).

- (20) a. John bought *too big* a car.
 b. [_{DP} too big_i [_{D'} a [_{NP} t_i car]]]

Also within the adjectival domain, there are phenomena that hint at the existence of leftward movement of adjectival material. In Corver (1997a,b), for example, the phenomenon

⁵ When the interrogative MP is part of a *by*-phrase, pied piping of the entire adjective phrase is impossible, as shown in (i). Presumably, (i) is ruled out by the same principle that underlies the ill-formedness of (ii), in which the *wh*-phrase *who* is a complement of the preposition *of*, whose phrasal projection (PP) is part of a larger adjective phrase.

- (i) *I wonder [too tall by how many inches] John was.
 (ii) *I wonder [very proud of whom] John was.

of *enough*-inversion is analyzed in terms of head movement of the adjective (*proud*) and subsequent adjunction to Q (*enough*).⁶

- (21) a. John was *proud enough of his sister*.
 b. [QP proud_i+enough [AP t_i of his sister]]

Other phenomena that hint at the existence of leftward movement of adjectival material within the English XAP are given in (22).

- (22) a. John seemed to be [XAP dependent on noone for anything].
 Compare: *John seemed to be [AXP dependent on anyone for nothing].
 b. Who_i was John [XAP dependent on t_i for what]?
 Compare: *What_j was John [AXP dependent on who(m) for t_j]?
 c. John was [AXP mad at every mother_i about her_i behavior].
 d. Who_i was she [XAP grateful to t_i for his_i kindness]?

These sentences exemplify for the adjectival system the well-known Barrs and Lasnik (1986) observations about c-command relations in the verbal domain. Under the assumption that c-command governs relations like negative polarity licensing (22a), superiority (22b) and the relation between a quantifier/wh-operator and a variable (22c,d), the noun phrase following the first preposition (e.g., *noone* in (22a)) must c-command the noun phrase following the second preposition (e.g., *anything* in (22a)); see also Larson (1988), Pesetsky (1995). In other words, the former occupies a structurally more prominent position within XAP than does the latter. Under a Larsonian shell-analysis, for example, the string *dependent on noone for anything* possibly has the underlying structure in (23a) and the derived structure in (23b):

- (23) a. [AP John [A' e [AP on noone [A' dependent for anything]]]]
 b. [AP John [A' dependent_i [AP on noone [A' t_i for anything]]]]

According to the derivation in (23b), the string *dependent on noone for anything* is derived by head (i.e. A⁰) movement. It could be, however, that the adjectival constituent that is moved leftward within the XAP is not a head, as in (23b), but rather a phrase. One reason for believing this is that the sequence 'degree word + adjective' is removable from XAP, as exemplified by (24):⁷

- (24) a. *How mad* was she *at each student_i for his_i impoliteness?*
 b. *How grateful* do you think she was *to each student_i for his_i help?*

⁶ Possibly, (21b) can be reinterpreted in terms of (remnant) phrasal movement of *proud* after *proud*'s complement has been moved out of AP. Bowers (1975:552) gives example (i) in support of the idea that what moves past *enough* is a phrasal constituent (here, *more interesting*); see also Kayne (2002, note 15).

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

⁷ For discussion of this phenomenon, see Yagi (1977), Hendrick (1979), Namiki (1979), and Koster (1987). In the literature, three types of analyses of this phenomenon can be found: (i) an analysis in terms of reanalysis: the PP is removed out of the AP and the entire AP is subsequently fronted (Koster 1987); (ii) an analysis stating that PP is not AP-internal but rather a clause-internal adjunct (Hendrick 1978); (iii) an analysis in terms of A'-fronting (i.e. displacement of a non-maximal adjectival projection), which adopts the following base structure: [AP [A' Degree word + A] PP]. That is, the degree word starts out in position structurally lower than PP (Yagi 1977, Namiki 1979).

In line with Yagi (1977) and Namiki (1979), I assume that the degree word and the adjective merge together and consequently form a syntactic (adjectival) unit, before the PPs are added to the XAP. One way of implementing this would be along the lines of Kayne's (2002, 2004) proposal that complement-PPs (e.g., *at each student* in (24a)) are not base generated as the complement of (i.e., E-merged with) A, but are introduced later in the derivation: the preposition is merged externally to AP and acts as a probe attracting the DP-complement (i.e., internal argument) of A. In other words, P's role is not theta-role-related. It is the adjective that is solely responsible for theta-role assignment to the internal argument. Following Kayne, I assume that the internal DP-argument raises to the specifier position of the prepositional probe (arguably, for reasons of case assignment). This movement operation is (sometimes) followed by movement of P to some higher functional head W (mnemonic for word order) within the extended adjectival projection. Spec,WP functions as a potential landing site for a "small" adjectival projection (*in casu* DegP) that has been moved within the (bigger) XAP.

To make things more concrete, the derivational steps are depicted in (25) for the adjectival expression *how mad at each student for his impoliteness*. I take *at* in *at each student* to be a functional preposition that attracts an argumental noun phrase (*each student*) to its Spec-position. I further assume that *for his impoliteness* is an adjunct-PP which, in line with Cinque's analysis of adverbial expressions (1999, 2004), occupies the specifier position of some functional "adverbial" layer. A property that hints at the adjunct-status of *for his impoliteness* is its adverbial meaning: 'because of'. The preposition *at* in *at each student* does not seem to contribute meaning to the structure and has a more functional role.

- (25) a. base structure:
 [_{AP} mad]
 b. E-merge of DP-complement
 [_{AP} mad [_{DP} each student]]
 c. E-merge of *how*
 [_{DegP} how [_{AP} mad each student]]
 d. E-merge of modifying *for*-PP in Spec,FP
 [_{FP} [for his impoliteness] [_{F'} F [_{DegP} how mad each student]]]
 e. E-merge of *at*
 [_{PP} Spec [_{P'} at [_{FP} [for his impoliteness] [_{F'} F [_{DegP} how mad each student]]]]]
 f. I-merge of *each student*
 [_{PP} each student_i [_{P'} at [_{FP} [for his impoliteness] [_{F'} F [_{DegP} how mad t_i]]]]]]
 g. E-merge of W
 [_{WP} Spec [_{W'} W [_{PP} each student_i [_{P'} at [_{FP} [for his impoliteness] [_{F'} F [_{DegP} how mad t_i]]]]]]]]
 h. I-merge of *at* (i.e., head movement to W)
 [_{WP} Spec [_{W'} at_k+W [_{PP} each student_i [_{P'} t_k [_{FP} [for his impoliteness] [_{F'} F [_{DegP} how mad t_i]]]]]]]]
 i. I-merge of DegP [*how mad t_i*]
 [_{WP} [how mad t_i]_j [_{W'} at_k+W [_{PP} each student_i [_{P'} t_k [_{FP} [for his impoliteness] [_{F'} F t_j]]]]]]]]
 j. Subextraction of *how mad*
 [how mad t_i]_j [_{WP} [~~how mad t_i~~]_j [_{W'} at_k+W [_{PP} each student_i [_{P'} t_k [_{FP} [for his impoliteness] [_{F'} F t_j]]]]]]]]

This derivation consists of the following steps: First, A combines with its internal argument *each student* (25b).⁸ Second, *how* combines with AP, yielding DegP (25c). Third, an "adverbial" F-head merges with DegP and the adverbial *for*-phrase is generated in Spec,FP (25d). Fourth, the functional preposition *at* merges with adverbial FP (25e). Fifth, the argument *each student* is moved into the specifier position of P (25f). It is this structure in which the quantified noun phrase *each student* binds the pronoun *his* in its c-command domain. Sixth, the functional head W combines with PP (25g). Seventh, the preposition *at* raises from P to W, yielding representation (25h). As a final step, movement of DegP [*how mad t_i*] into Spec,WP takes place. It is this representation that provides the configuration for subextraction from XAP, as in (24a), possibly with an extra XAP-internal movement step that places DegP into the Spec-position of an "adjectival" CP-layer (see Corver to appear).

In sum, a language like English displays (leftward) movement of adjectival constituents (heads and phrases), including phrases of the type DegP (see (20a), (25i,j)). Given the existence of these DegP-movements, the derivational analysis depicted in (17) is not surprising then: the DegP *too tall* shifts leftward and ends up in an XAP-internal, left-peripheral position, arguably the specifier position of some functional projection. The question obviously arises what this position is. This question will be addressed in section 5. For now, I limit myself to making the derivational step depicted in (17) a little bit more explicit; that is, the adjectival chunk *too tall*, a DegP, shifts leftward across *by two inches* to the Spec-position of some higher functional projection FP.

(26) [_{FP} [_{DegP} *too tall*]]_i [_{F'} F [*by two inches t_i*]]

As an intermezzo, section 4 will discuss two word order alternation phenomena—one from English, the other from Italian—which have been analyzed in terms of movement of a verbal chunk (i.e. a phrasal projection) across an intervening XP. One alternation is the active-passive alternation introduced at the beginning of this chapter (see (1)). The other alternation involves the ordering of a clause-internal modifying adverb and the modified verbal projection. MP-alternation, which is the central phenomenon of this chapter, is more or less a combination of the two alternations in the sense that it involves a *by*-phrase (as in passives) whose nominal subpart (i.e. MP) acts as a modifier. In section 5, the structural representation given in (26) will be refined, based on insights from analyses of the above-mentioned word order alternations in the clausal domain.

4. Leftward displacement of verbal chunks in the clausal domain

In the previous section it was argued that the MP-alternation in (3) results from leftward movement of the DegP *too tall* to a left peripheral position within XAP. Thus, an adjectival chunk moves leftward and ends up in a position to the left of the MP. An important starting point of this analysis was the idea that there is a single base position for MP. That is, the bare MP *two inches* in *two inches too tall* and the prepositionally "dressed" MP *by two inches* in *too tall by two inches* start out in one and the same syntactic position. This analysis, which will be worked out in more detail in section 5 is inspired by Collins's analysis of the active-passive alternation in English. In what follows I will briefly sketch Collins's analysis.

According to Collins's analysis, the base position of the agent noun phrase in the active sentence—*John* in (1a), repeated here as (27a)—is identical to the base position of the agent

⁸ In this derivation I abstract away from the syntactic placement of the external argument of the extended adjectival projection.

noun phrase following the preposition *by* in the passive construction —*John* in (1b), repeated here as (27b).

- (27) a. John_{agent} kissed her_{theme}. (active construction)
 b. She_{theme} was kissed by John_{agent}. (passive construction)

The base position of the agent noun phrase is taken to be Spec,vP. Starting from this assumption, Collins argues that the postverbal placement of the prepositionally dressed agent noun phrase (*by John*) follows from leftward movement of a verbal chunk —more specifically, a Participle Phrase— to the Spec-position of a higher functional head, viz. Voice. Leaving out details, I have given the (intermediate) derived structure in (28) for the passive sentence *Sue was kissed by John*.

- (28) [_{VoiceP} [_{PartP} kissed Sue] [_{Voice'} Voice [_{vP} [_{PP} (by) John] [_{v'} v [~~PartP~~ kissed Sue]]]]]]

As Collins notes, movement of PartP smuggles the internal argument (*Sue*) across the agentive noun phrase *John* in Spec,vP. This way, a violation of Relativized Minimality (Rizzi 1990) —*in casu* movement of the internal argument *Sue* across the external argument *John*— is circumvented. Being embedded within PartP, the internal argument (the smugglee) is invisible for the external argument in Spec,vP. The passive sentence *Sue was killed by John* is derived by moving the internal argument *Sue* from within the (displaced) PartP in Spec,VoiceP to Spec,TP:⁹

- (29) [_{TP} Sue_i [_{T'} was [_{VoiceP} [_{PartP} kissed t_i]_j [_{Voice'} Voice [_{vP} [_{PP} (by) John] [_{v'} v t_j]]]]]]]

In the course of his 2005 article, Collins makes a small adaptation as regards the syntactic analysis of the preposition *by*. In representation (28), the argument *John* forms a constituent (PP) with *by*. The PP *by John* occupies the specifier position of vP. Collins notes that this analysis faces a number of problems. First of all, under a strict interpretation of Baker's (1988) UTAH (Uniformity of Theta Assignment Hypothesis), one expects that a DP —i.e., the form found in spec,vP of active sentences—, and not a PP, should be generated in Spec,vP in passive clauses too. Secondly, if *by* can accompany an argumental agent-DP, as in (29), it is not entirely clear what blocks its presence with other types of argumental DPs: **the leg of (*by) the table; proud of (*by) his son*. Of course, one could stipulate by means of some sort of subcategorization rule that *by*'s appearance is restricted to an argumental DP that occupies the Spec-position of passive v. Clearly, such an implementation of the *by*-property is highly inelegant. Given these (and other) problems with the '*by*-DP in Spec,vP' approach, Collins proposes an alternative analysis. This analysis starts from a different perspective on the selectional relationship between v(P) and *by*. Specifically, it is not v that selects a *by*-phrase; rather, it is *by* which selects a (passive) vP. In other words, the lexical entry of *by* has the subcategorization frame [__ vP].¹⁰ This selectional relationship is implemented by taking *by* to instantiate the Voice head in (28). This yields the following representation:

- (30) [_{VoiceP} [_{PartP} kissed Sue] [_{Voice'} by [_{vP} [_{DP} John] [_{v'} v [~~PartP~~ kissed Sue]]]]]]

⁹ As Collins (2005) notes, the smuggling analysis implies that displacement of a phrasal constituent does not always lead to a freezing effect. See Boskovic (2016) for discussion of structural configurations that permit extraction from displaced constituents.

¹⁰ Since *by* selects vP, the ill-formedness of **the leg of (*by) the table; proud of (*by) his son* is straightforwardly accounted for: *by* does not select an (argumental) DP. See also section 6.

According to Collins's reinterpretation of *by*, *by* is a dummy preposition —i.e. a preposition consisting entirely of uninterpretable features— on the projection line of the extended verbal projection (i.e., the clause).¹¹ It acts as a linker in the sense of Baker and Collins (2003) and its syntactic behavior shows similarities to that of the prepositional complementizer *for* in clausal expressions such as *For John to win would be nice*. Just like the prepositional C *for*, the prepositional Voice-head *by* does not fulfill the role of a theta assigner; that is, it does not assign a theta role to its complement. And just like *for*, *by* checks the accusative case of the noun phrase in the specifier position of its complement (Spec,TP for *for* and Spec,vP for *by*). Clearly, the analysis depicted in (30) shows similarities with Kayne's (2002, 2004) analysis of prepositions as functional heads that attract their nominal "complements," and force the entire remnant to raise to their left, which yields a surface order having the nominal complement in final position; see the derivation in (25).

Clause-internal leftward movement of verbal chunks has been proposed not only for word alternation phenomena involving arguments but also for word order alternations involving adjuncts. In his treatment of word order variation in Italian involving clause-internal adverbs, Cinque (2004), for example, shows that adverbs such as *rapidamente* can fully naturally appear in clause-internal (i.e. pre-verbal) position, besides being able to occupy a clause-final (i.e. postverbal) position. This is illustrated in (31).

- (31) Gianni ha <rapidamente> risolto il problema <rapidamente>.
 'Gianni has rapidly solved the problem.'

Cinque takes the preverbal position to be the base position and proposes that the postverbal placement of *rapidamente* results from (optional) leftward movement of a verbal constituent past the modifier. Schematically:

- (32) [_{YP} [risolto il problema] [_{Y'} Y [_{FP} [_{AdvP} rapidamente] [_{F'} F [~~risolto il problema~~]]]]]

As noted in Cinque (2004) and Belletti and Rizzi (2012), placement of an adverbial PP in between the auxiliary and the participle gives rise to marginality (? is the judgment given in Belletti and Rizzi 2012):

- (33) Gianni ha <[?]con rapidità> risolto il problema <con rapidità>.
 'Gianni has rapidly solved the problem.'

Under the assumption that *rapidamente* and *con rapidità* have the same base position (Cinque 2004), this contrast must be accounted for. Belletti and Rizzi argue that the mild deviance of the pattern having *con rapidità* in between the auxiliary and the main verb is due to a (mild) violation of the Relativized Minimality principle. Specifically, the noun phrase *rapidità* acts as an intervener for the subject noun phrase *Gianni*, which originates in a vP-internal subject position (Spec,vP); see Koopman and Sportiche (1991). Movement of *Gianni* to Spec,TP crosses the adverbial PP containing the nominal modifier. Since, being embedded in PP, *rapidità* does not directly interfere, the violation of Relativized Minimality is said to be mild.¹²

¹¹ See also Jaeggli (1986) for the claim that passive *by* is not just associated with the agent role.

¹² See Belletti and Rizzi (2012) for an alternative account of the mild deviance of preverbal *con rapidità* in (33).

The pattern in which *con rapidità* follows *risolto il problema* is fully acceptable. This is so because the vP containing the (vP-internal) subject *Gianni* is moved to a position preceding *con rapidità* before *Gianni* is moved from within vP to Spec,TP. In short, the displaced vP smuggles *Gianni* (the smugglee) across (the PP containing) the noun phrase *rapidità*. Schematically:

- (34) [_{TP} Gianni_i ... [_{YP} [_{t_i} risolto il problema] [_{Y'} Y [_{FP} [_{AdvP} con rapidità] [_{F'} F [~~risolto il problema~~]]]]]]

In summary: in the generative-linguistic literature, it has been argued that the mechanism of smuggling provides a way of circumventing a violation of Relativized Minimality. The intervention by a potential intervener (the "nominal complement" of P, where P is English *by* and Italian *con* in the above discussion) can be circumvented by moving a verbal chunk (vP) across the potential nominal intervener and subsequently extracting the subject out of the displaced vP and moving it to Spec,TP. In section 7, I will show that this smuggling device is also used in clausal constructions featuring prepositionally dressed MPs like (5b): *Mary outlived her husband by five years*. But before discussing these constructions, I return to the MP-alternation in the adjectival construction discussed in sections 2 and 3.

5. DegP movement and the nature of *by*

The analysis of passive *by* in (30) raises the following question: Can Collins's analysis of passive *by* as a dummy preposition that occupies a head position (Voice) on the clausal projection line and fulfills a purely syntax-internal role (viz., case licensing) be extended to "measure" *by*? Following Collins's argumentation, it does not seem plausible to generate the dressed MP (i.e. PP) *by two inches* in the same structural position as the bare nominal expression *two inches*. If the bare MP and the dressed one have an identical meaning—in informal terms: 'to the amount or degree of X'—then one would expect the bare (i.e. more minimal) form to be sufficient. Furthermore, if *by* would simply be an element that can optionally be added to a measure nominal, then one would expect it to surface also in other structural environments featuring an MP. However, as exemplified in (35), MP cannot be "augmented" with *by* in those configurations:

- (35) a. John weighed (*by) 80 pounds.
 b. John is (*by) five feet tall
 c. She looks (*by) 10 years old.

The idea that MP is not a selected complement of *by* possibly also receives support from the semantic side. As argued in Schwarzschild (2005), the MP is not a thematic argument—that is, it does not carry a thematic role assigned by the preposition *by*—but rather a predicate (i.e., a modifier) that gives the size of the gap between two points on a scale.¹³ For example, to say that John is two inches too tall to serve on a submarine is to say that there is a 2-inch gap between John's height and the cut-off for working on a submarine. Under an analysis in which P selects MP, as in (26), the question arises what grammatical role P fulfills if MP is a predicate nominal. One might propose that P is a linker that mediates between the modifier (*two inches*) and the modifiee (*too tall*). However, if MP needs a linker for establishing a

¹³ See also Ross (2002) and Corver (2009) for the idea that MPs are not argumental noun phrases but predicative noun phrases.

predicative relationship in *two inches too tall*, the question arises why this linker is not needed in an expression like *(*by) five feet tall*, where MP also acts like a predicate rather than an argument (see Schwarzschild 2005).

In short, an analysis in which *by* forms a constituent with MP seems problematic. Also here, a shift of perspective may provide the right answer to the question regarding the role of "measure" *by*: it is not the *by*-phrase that is selected by some functional head (*in casu* Deg). Rather, it is the element *by* that selects the degree projection as its complement, as in (36).

(36) [PP Spec [P' by [DegP two inches [Deg' too [AP tall]]]]]

The string *too tall by two inches* can be derived from (36) by moving *too tall* into the specifier position of *by*, as in (37):

(37) [PP *too tall*_i [P' by [DegP [MP two inches] [Deg' t_i]]]]

It should be noted, however, that this displacement involves a non-maximal projection, viz., Deg'. Such movements are often taken to be impossible; that is, only heads and maximal projections are input to displacement. A slight reinterpretation of (37), however, solves this problem. Suppose that, instead of being base-generated in Spec,DegP, the MP *two inches* originates in the specifier of the *by*-phrase, as in (38a). Suppose, furthermore, that in the spirit of Kayne (2002) there is a phrasal projection WP on top of PP, whose head (W) can attract the preposition *by* and whose Spec-position functions as a landing site for the displaced DegP. Application of these two movement operations yields the structure in (38b).¹⁴

(38) a. [PP two inches [P' BY [DegP too [AP tall]]]] (BY is a silent, i.e. unpronounced, P)
 b. [WP [DegP *too tall*]_i [W' by_j+W [PP two inches [P' t_j t_i]]]]

Placing MP in the specifier position of a designated functional projection is compatible with Cinque's (1999, 2004) approach to the syntax of adverbial expressions. In the spirit of

¹⁴ So far, all my examples of the patterns in (38) feature a Measure Phrase. It should be noted, though, that also other types of phrases designating a quantity can be used:

(i) It is <a little bit/a lot/a great deal> too short <by a little bit/by a lot/by a great deal>

Interestingly, certain quantity designating phrases are restricted to a position preceding *too+A*. In other words, these phrases can't occur as prepositionally dressed forms (i.e., with *by*) in a position following *too+A*. Consider, first of all, the following idiomatic measure phrases:

(ii) a. It is <a touch> too difficult <*by a touch> to monitor this.
 b. The multi-million dollar purchase of the small startup proved <a bridge> too far <*by a bridge> for the social media company, as the added revenue couldn't make up for the cost in the end.

Notice also the following contrast:

(iii) It is <much/way/somewhat> too short <*by much/*by way/*by somewhat>

These examples suggest that the "bare" (i.e. *by*-less) pattern is the most productive one. One might interpret the broader use of this pattern as evidence in support of it being the base order. I leave the analysis of the above contrasts for future research.

Baker and Collins's (2006) interpretation of passive *by*, I analyze measure *by* as a linking head.¹⁵ Specifically, it links the modifying MP (the predicate nominal) occupying the specifier position of the functional head *by* to the modified DegP, which is the complement of *by*. If *by* is a selecting head, one expects it to be compatible with a particular type of DegP. Clearly, *too tall by two inches* is fine but *very/extremely tall by two inches* is not. It seems that *by* typically selects a DegP that encodes the idea of comparison, that is, superiority ('more than') or inferiority ('less than'). The meaning of the degree word *too* can informally be characterized as: 'more than enough' or 'more than decent, or proper, or good' (see Jespersen (1977: 248)). To say, for example, that John is too tall to work on a submarine is to say that John's height is of a higher degree than the maximum height allowed for working on a submarine. If *by* selects a degree phrase expressing comparison, then we expect this element to appear also in other adjectival constructions expressing the idea of comparison. Some examples are given in (39)-(41).¹⁶ Observe that each of these constructions displays the phenomenon of MP-alternation.¹⁷

- (39) John is [*<two inches> taller than Bill <by two inches>*].
 (40) The train was [*<ten minutes> overdue/late <by ten inutes>*].
 (41) She was [*<about ten pounds> overweight/underweight <by about ten pounds>*].

In (39), MP is part of an XAP containing the bound comparative morpheme *-er*. In (40)-(41), there is no comparative morpheme present but the adjectives *overdue*, *late*, *overweight* and *underweight* have a comparative meaning component in the sense that the degree D_i to which the property designated by the adjective holds is more (e.g. *overweight*), or less (e.g. *underweight*), than the degree D_j to which the property expressed by the adjective holds under "normal" circumstances (i.e., the standard of comparison). For example, *ten minutes overdue* implies that the train will arrive ten minutes later than the normal time of arrival as given by the train schedule. Thus, *overdue* expresses a relation between points on a time line, and the MP *ten minutes* gives the size of the gap between the two points (see Schwarzschild 2005).

In the spirit of Collins's (2005) analysis of passive *by*, I have so far proposed in this section that *by* is a linker connecting a measure phrase to a complement encoding the property of comparison. In the generative-linguistic literature on linking elements (see e.g. Kayne 1994, Den Dikken 2006), the preposition *of*, and its equivalent in other languages (e.g. French *de*), has been identified as a characteristic linker in various syntactic constructions. For example,

¹⁵ See also Den Dikken (2006: 38-41) for an analysis of prepositions as mediators in a modification relation. In his analysis, prepositions are so-called Relators that mediate a predication relationship between two terms.

¹⁶ Jespersen (1977, Chapter XVIII) calls adjectives such as *taller*, which (i) carry a morpheme *-er* encoding comparison, and (ii) can be accompanied by a *than*-phrase, 'formal comparatives'. Adjectival expressions such as *too tall*, *overdue*, *late*, and *over-/underweight* are what he calls 'latent comparatives'. Note, for example, that these adjectival expressions cannot be combined with a *than*-phrase:

- b. This train was [ten minutes late/overdue (*than that train)].
 b. This train was [ten minutes later (than that train)].

Other latent comparatives are the verb *to outlive* ('to live longer than') and the words *senior* and *junior*. See sections 6 and 7 for discussion of these items.

¹⁷ I will leave the internal syntax of the latent comparative adjectival expressions in (40) and (41) for future research. I assume they are DegPs, where, possibly, the Deg-head (or its specifier position) is occupied by *over-/under-*, or by a zero-morpheme in the case of *late*.

Kayne (1994:102), gives the following French examples of constructions featuring the linking element *de* (cf. also Kayne 2002):

- (42) a. cet [D/PP [NP imbécile_j] [de [IP Jean [I° [e]_j ... (p. 106)
 that idiot of Jean
 b. le [D/PP [AP rouge_j] [de [IP crayon [I° [e]_j ... (p. 106)
 the red of pencil

According to Kayne's structural analysis of these patterns, the phrase preceding *de* is moved from a position after I° to the specifier position of *de*.

If English *of* and French *de* are linking elements, just like English (passive and measure) *by*, one might expect these elements to surface in structural environments featuring *by* in present-day English. Consider, first of all, passive *by*. As noted in Jespersen (1964:123; 1977:164), older varieties of English used passive *of* instead of passive *by*.¹⁸

- (43) a. Where like a virtuous monument she lies,
 To be admired *of lewd* unhallowed eyes.
 (The Rape of Lucrece (1594), W. Shakespeare)
 b. Chaucer (*of all* admir'd) the Story gives.
 (The two Noble Kinsmen (1634), J. Fletcher and W. Shakespeare)
 c. [...] Stay, I fancy
 I'm now turned wild, a commoner of Nature;
Of all forsaken, and forsaking all
 (All for Love (1677), J. Dryden)

As shown in (46), present-day French also has passive constructions featuring the linking preposition *de* instead of *par* 'by'; examples taken from Corbeau (1951:105):¹⁹

- (44) a. Ce prince est aimé *de tous ses sujets*.
 this prince is loved by all his subjects
 b. Le vieillard était accompagné *de ses deux fils*.
 the old man was accompanied by his two sons

Interestingly, as shown in (45b), the preposition *de* also surfaces in the French equivalent of *too tall by two centimetres*. Its presence is obligatory. As shown by (45a), *de* is optionally present in the French equivalent of the English pattern *two centimetres too tall*.²⁰

- (45) a. Il était (de) quelques centimètres trop long.
 he was (of) several centimetres too tall
 b. Il était trop long *(de) quelques centimètres.
 he was too tall of several centimetres

¹⁸ As Jespersen notes (1964: 123), this use of passive *of* is still found in modern English chiefly after verbs denoting mental states, as in *The rose is the most romantic of flowers, beloved of poets, singers, and artists*. For some of my informants, this use of *of* sounds archaic.

¹⁹ As noted by Corbeau (*ibidem*), *de* is often used with verbs that express a habitual action or a state that holds for a longer period of time. The preposition *par* 'by' is preferred with verbs that express a momentaneous and spontaneous action, as in *Il était suivi partout par un détective* 'He was followed everywhere by a detective' and *La maison a été entouré par la police* 'The house has been surrounded by the police.'

²⁰ See Zamparelli (1993) for Italian.

I propose the analysis in (46) for the *de*-less pattern in (45a). The MP *quelques centimètres* occupies the specifier position of a silent "measure" P. Consider next pattern (45b). As indicated in (47), I assume that this representation results from head movement of P (*de*) to W in combination with phrasal movement of DegP (*trop long*) into the Spec-position of WP.

(46) $[_{PP} \text{ quelques centimètres } [_{P'} \text{ DE } [_{\text{DegP}} \text{ trop } [_{AP} \text{ long}]]]]$ (DE is silent P)

(47) a. Head movement of *de* to W

$[_{WP} \text{ de}_i + W [_{PP} \text{ quelques centimètres } [_{P'} \text{ t}_i [_{\text{DegP}} \text{ trop } [_{AP} \text{ long}]]]]]$

b. Movement of DegP to Spec,WP

$[_{WP} [_{\text{DegP}} \text{ trop long}]_j [_{W'} \text{ de}_i + W [_{PP} \text{ quelques centimètres } [_{P'} \text{ t}_i \text{ t}_j]]]]$

Now what about the pattern in (45a) with *de* in front of *quelques centimètres*? Under the assumption that *de* typically surfaces in a functional head position whose Spec-position is occupied by a displaced phrasal constituent, one expects there to be a moved phrasal constituent in the Spec-position of the head position occupied by *de*. Suppose now, in line with Kayne (2002), that measure-P (i.e., the preposition that has MP in its Spec-position) can also be base-generated in a position within the clausal domain. In other words, *de* in (45a) is in a position external to the extended adjectival projection. The "starting structure" with *de* in clause-internal position is given in (48a) and the following derivational steps are given in (48b-e).²¹

(48) a. Merger of P (*de*) in clause-internal position

$[_{PP} \text{ de } [_{VP} \text{ était } [_{SC} \text{ il } [_{XAP} \text{ quelques centimètres trop long}]]]]]$

b. Movement of SC to Spec,*de*

$[_{PP} [_{SC} \text{ il quelques centimètres trop long}]_i [_{P'} \text{ de } [_{VP} \text{ était } \text{t}_i]]]$

c. Movement of *de* to W

$[_{WP} \text{ de}_i [_{PP} [_{SC} \text{ il quelques centimètres trop long}]_i [_{P'} \text{ t}_j [_{VP} \text{ était } \text{t}_i]]]]]$

d. Movement of VP to Spec,*de*

$[_{WP} [_{VP} \text{ était } \text{t}_i]_k \text{ de}_j [_{PP} [_{SC} \text{ il quelques centimètres trop long}]_i [_{P'} \text{ t}_j \text{ t}_k]]]]$

e. Movement of *il* to Spec,TP + V-to-T

$[_{TP} \text{ il}_m [_{T'} \text{ était}_n [_{WP} [_{VP} \text{ t}_n \text{ t}_i]_k \text{ de}_j [_{PP} [_{SC} \text{ t}_m \text{ quelques centimètres trop long}]_i [_{P'} \text{ t}_j \text{ t}_k]]]]]]$

So far, I have shown that English *by* (*too tall by two inches*) and French *de* (*trop long de quelques centimètres*) typically surface in syntactic configurations in which P (*by/de*) has moved to W and Spec,WP is occupied by a displaced phrase. The prepositional element does not surface in its base position: *two inches *(by) too tall / quelques centimètres *(de) trop long*. The question, obviously, arises as to what underlies this asymmetry. I tentatively propose that the presence *versus* absence of *by/de* is governed by a constraint like the Doubly-filled-XP filter (Chomsky and Lasnik 1977, Koopman 2000a); that is, either the specifier position or the head of a functional projection FP is filled by phonologically overt material.

²¹ That *de* can also be base-generated in the clausal domain is suggested by the existence of copular constructions such as (ia,b):

- (i) a. Le retard est **(de) deux minutes*.
the delay is of two minutes
b. La course est **(d)'un kilomètre*.
the run is of one kilometre

Thus, the functional head and its Spec-position cannot be lexically filled simultaneously. In (38b) and (47b), we appear to have a violation of the doubly filled FP constraint as well, since both the Spec-position and the head-position are lexically filled. However, if P (*by/de*) head-moves and adjoins to the phonetically empty W, the complex head still counts as being empty, under the assumption that the silent W-host determines the nature of the complex head: [_W *de* [_W Ø]]. That is, *de*, being a subpart of a complex word, whose head is silent, remains "invisible" for the Doubly-filled-XP-filter.

Summarizing, I have tried to show in this section that *by* is a linking preposition that takes a DegP encoding comparison as its complement, and whose specifier position can be occupied by a Measure Phrase. In the next section, I will extend my empirical investigation of MP alternation by addressing the question as to whether MP-alternation is also attested in the nominal domain.

6. MP alternation in the nominal domain

So far, I have examined the phenomenon of MP-alternation in the eXtended Adjectival Projection (XAP). It was shown that MP-alternation is typically found in adjectival structures having a comparative meaning. In sections 6, 7 and 8, I address the question as to whether MP-alternation is also attested in other phrasal domains, more specifically the nominal domain (section 6), the verbal/clausal domain (section 7), and the prepositional domain (section 9).

MP-alternation is also attested in nominal expressions such as (49) and (50); see also Jespersen (1977: 249).²²

- (49) John is <*ten years*> *my senior/junior* <*by ten years*>.
 (50) She was <*ten years*> *my elder/younger* <*by ten years*>.²³

That the italicized strings are constituents is shown among others by their ability to move as a unit, as in (51a), and by the fact that they can be substituted for by a pro-form, as in (51b).

- (51) a. <*Ten years*> *my senior* <*by ten years*> John certainly is!
 b. Although he does not look *it*, John is <*ten years*> *my senior* <*by ten years*>.

The presence of the possessive pronoun *my* before *senior/junior* and *elder/younger* suggests that the strings in italics are nominal expressions. As for their internal syntax, two analyses come to mind. First of all, *senior/junior* and *elder/younger* are nouns, possibly derived from adjectives via zero-morphology: [_N [_A *senior/elder*]-Ø]. Secondly, *senior/junior* and *elder/younger* are attributive adjectives within a noun phrase whose head is silent (Kayne 2003): [*my* [[_{AP} *senior/elder*] *N*Ø]]. Before making a decision on what the right analysis is for the nominal expressions in (49) and (50), consider also the following facts:

- (52) a. <**Ten years*> *my senior* <**by ten years*> left the company after a few months.
 b. She fell in love with <**two years*> *her senior* <**by two years*>.

²² The words *senior* and *junior* have their origin in Latin and contain the comparative morpheme *-ior*. Other adjectives ending in *-ior* that have a comparative meaning are: *anterior* ('before in time/place'), *exterior* ('external'), *posterior* ('later in time'), *prior* ('earlier in time'), *superior* ('higher in place or position').

²³ Some of my informants do not accept (50) with *younger*.

In these examples, MP cannot be combined with *my senior*. The question, obviously, arises as to what underlies this contrast between (52), on the one hand, and (49a), on the other. Notice that the italicized nominal expression in (49) has a grammatical role that is different from the one in (52). In (49), and also (50), it functions as a predicate nominal, in (52) it has an argumental role. I propose that this contrast in grammatical function correlates with a difference in internal structure. Specifically, in its argumental use, *senior* is a (zero-derived) noun. Thus: [_N [_A *senior/elder*]-Ø]. The ill-formedness of the patterns featuring MP in (52) is due to the fact that the comparative property associated with *senior* is "inaccessible" to the modifying MP; that is, no modification relationship can be established between the modifying MP *ten years* and the modifiee *senior*. I assume its inaccessibility is due to the fact that *senior* is a subpart of a complex word. The MP *ten years*, being a modifier in phrasal syntax, cannot act as a modifier of an element that is embedded in a word. In short, the principle of Lexical Integrity blocks a modification relationship between MP and *senior*.²⁴ As a result of that, (*by*) MP is a vacuous modifier. This causes the ungrammaticality of the italicized strings in (52).

Returning to the well-formed patterns in (49) and (50), I propose that *senior* is an attributive AP that modifies a silent noun. Thus: [*my* [[_{AP} *senior/elder*] *N*Ø]], or alternatively, [*my* [[_{AP} *senior/elder*] *ONE*]], where *ONE* is a silent noun in the sense of Kayne (2003). Evidence in support of an attributive-AP-analysis of *senior/elder* comes from the following examples, in which *senior* is bare—more specifically, it does not carry a plural suffix *-s*—even though the (italicized) predicative noun phrase has a plural interpretation:

- (53) a. So far I've only mentioned a 20 year age gap, what about the couples (and there are some out there) who opt for partners who are *30 years their senior*.
 b. I am excited about the prospect of getting to know my peers, some of whom are *ten years my junior*.
 c. Makarov is still one of the youngest members of the team and competes regularly against players who are *10-15 years his elder*.

If *senior* and *elder* were nouns, one would expect plural *-s* to be obligatorily present, as in *Millennials are more receptive to immigrants than are their elder*(s)*.

Interestingly, examples can be found in which plural *-s* is found attached to *senior/elder*, where the latter is preceded by MP. Some examples, drawn from English texts available on the internet, are given in (54):

- (54) a. When the Rolling Stones fell in love with American blues music as teenagers in England in the late 1950s and early '60s, the grand old men of the genre they idolized were *20 to 30 years their seniors*.
 b. [...] recent graduates may be more flexible to live on campus, coach a sport or two, and make connections with students who are *just a few years their juniors*.
 c. Therein lies the challenge for freshmen, especially this time of the year. How ready are they for the bright lights, not to mention the prospect of staring down seniors who are *three years their elders*?

²⁴ 'Lexical integrity' stands for the property that no syntactic process is allowed to refer to parts of a word. For example, it is impossible to refer to *coffee* in *coffee pot* by means of the pronoun *it*: *Mary took the *coffee*, *pot*, and *poured it*, into the mug, meaning 'Mary poured the coffee into the mug'.

I propose that in these examples, a plural *-s* is attached to the silent noun *ONE*. For example, *20 to 30 years their seniors* in (54a) has the representation: *[20 to 30 years my [_{AP} senior] ONE-s]]*. This analysis is reminiscent of Kayne's (2003) analysis of *the others* as *the other ONE-s*.

Having argued that *senior/junior* and *elder/younger* are attributive APs in (49)-(50), let us next see how MP is integrated into the predicative noun phrase. With the hypothesis of cross-categorical symmetry in mind, one would expect that the structural configurations that correspond to the noun phrases in (49) and (50) are quite similar to those corresponding to the adjective phrases *ten years too tall* and *too tall by ten years*. This brings us to the analyses in (55a) and (55b):

- (55) a. [_{PP} ten years [_{P'} BY [_{DP} my [_{D'} D [_{NP} senior ONE]]]]]
 b. [_{WP} [_{DP} my senior ONE]_i [_{W'} by_j+W [_{PP} ten years [_{P'} t_j t_i]]]]

As indicated, I take *my senior* to be a DP whose Spec-position is filled by the pronoun *my*. In line with my analysis of "measure" *by* in section 5, I take the *by*-head to be a functional head in the extended projection which takes a phrase expressing the idea of comparison as its complement. The comparative property is associated with the attributive APs *senior/junior* and *elder/younger*, but gets associated with the larger nominal expression *my senior ONE* by the modification relationship between *senior* and the silent noun *ONE*. Informally put, *senior ONE* corresponds to 'someone senior'.²⁵ The possessor *my* refers to the individual whose age/rank is compared with that of the clausal subject. The MP designates the size of the gap that separates (the age/rank of) individual A from (the age/rank of) individual B.

The MP *ten years* occupies the Spec-position of *by*. In order to avoid a doubly-filled-XP effect, *by* must be deleted (or, alternatively, must remain silent) in (55a). In (55b), the DP *my senior ONE* is moved leftward to Spec,WP, whose head has *by* adjoined to it as a result of head movement. Under the assumption that the adjoined element *by* is invisible for the Doubly-filled-FP constraint, the Spec-position can be filled by *my senior ONE*.²⁶

I finish this section with a brief remark on French. Recall from section 5 that French uses the dummy preposition *de* in combination with MP (see (45)). As exemplified in (56), the French equivalents of (49) and (50) also feature the element *de*:

- (56) a. Il est (*de*) deux ans mon aîné/cadet.
 he is (of) two years my senior/junior
 b. Il est mon aîné/cadet de deux ans.
 he is my senior/junior of two years

²⁵ In British English, MP-alternation is also attested with *junior* and *senior* in their adjectival function (see Merriam Webster's learner dictionary: <http://www.learnersdictionary.com/definition/junior>).

(i) He is [_{AXP} <six years> junior to me <by six years>].

²⁶ As suggested by the negative polarity licensing relationship between the possessor *noone's* and the MP *any more years (than Mary was)*, the possessor embedded within the DP that occupies Spec,WP c-commands the negative polarity item that occupies the specifier of the PP headed by *by* (see (55b)). See Kayne (1994) for the idea that possessors occupying Spec,DP can c-command material located outside of DP.

(i) John was *noone's* senior by *any more years* than Mary was.
 (meaning: 'John and Mary have the same age.')

I propose that the sequence *dix ans mon aîné* has the structure in (57a), and the sequence *mon aîné de deux ans* the one in (57b). As for the analysis of *de deux ans mon aîné*, which features *de* before MP, I refer the reader to the analysis of *de quelques centimètres trop long* in (48).

- (57) a. [PP deux ans [P' DE [DP mon [D' D [NP cadet ONE]]]]]
 b. [WP [DP mon cadet ONE]_i [W' de_j+W [PP deux ans [P' t_j t_i]]]]

So far I have shown that MP-alternation is attested both in the adjectival domain (section 5) and in the nominal domain (section 6). The next section will address the question as to whether MP-alternation is also attested in the clausal domain.

7. MP alternation and smuggling in the clausal domain

In this section it will be shown that clause-internal MP alternation is more limited in the sense that only one of the two word orders is permitted, viz., the one featuring *by+MP* in postverbal position. The pattern in which an MP precedes a verb is impossible. The question arises, of course, why the latter pattern is ruled out in the clausal domain but permitted in the nominal and adjectival domains.

Given the fact that MP-alternation typically occurs in structural environments that encode the idea of comparison, we need to find verbal structures that display this meaning property. In what follows, I will show that such structures exist, restricting myself for the moment to patterns of the type *V + by-MP*.²⁷

Consider, first of all, the examples in (58) and (59).²⁸

- (58) a. Mary *outlived* her husband *by four years*.
 b. Mary *outweighed* her sister *by five pounds*.
 c. Lewis Hamilton *outran* his nearest challenger *by 1.211 seconds* at Suzuka.
- (59) a. Mary *overslept* her alarm *by one hour*.
 b. Costs *overran* the budget *by about 30%*.
 c. Some weeks ago I shot a whole event using a film camera and *overexposed* almost every shot *by one to more than three stops*.

The verbs in these examples express comparison to a higher degree (i.e., superiority). Thus, *outlived* in (58a) means "lived longer than" and *overslept* in (59a) means "slept longer than". In (58a), the *by*-phrase designates the (size of the) gap that separates Mary's age from the age

²⁷ French displays the prepositional element *de* also clausal constructions featuring an MP; see (i). For reasons of space, I won't discuss the derivation of these patterns. Arguably, movement of a verbal chunk across *de+MP* is involved, under the assumption that MP starts out in a preverbal position.

- (i) a. Elle a perdu 3 points pour avoir dépassé le temps *de 3 minutes*.
 she has lost 3 points for having gone-beyond the time by 3 minutes
 b. Ma montre retarde *de deux minutes*.
 my watch is slow of two minutes
 'My watch is two minutes slow.'

²⁸ The sentences in (58)-(61) are taken from English texts available on the internet. My informants, whom I asked for acceptability judgments of the sentences, accepted most of them. Some of them were judged as being slightly deviant (with interspeaker variation).

at which her husband died, and in (59a), the gap that separates the point on the time line at which Mary's alarm went off and the point at which Mary woke up.

Other verbs that express comparison to a higher degree are given in (60):

- (60) a. The Geopark not only attained the ambitious target of £ 30,000, but *exceeded* it *by £355*.
b. When I was younger I *exaggerated* my age *by five years*.
c. These farmers *increased* their income *by USD 101.75*.

The verb *exceeded* in (60a) means "to be greater than". The string *by £355* indicates the size of the gap that separates the target amount (£ 30,000) and the obtained amount (£ 30,355).

As shown in (61), *by*-phrases also combine with verbs that express comparison to a lower degree (inferiority). Thus, *abridged* in (61a) means "to make (something written or spoken) shorter by using fewer words".

- (61) a. The editors have *abridged* the book *by 3000 words*.
b. This time the pilgrims will not have to trek the entire route to the holy shrine as the construction of a motorable road has *curtailed* it *by 4 km* and they will be able to commute on their vehicles on this stretch.
c. They *lowered* the price *by another \$200*.

The examples in (58)-(61) raise the following question: What is the source of the comparative meaning? For answering this question, I start with the minimal pair in (62):

- (62) a. Mary outweighed her sister *by five pounds*. (= (58b))
b. Mary weighed her husband (**by five pounds*).

This minimal pair suggests that the comparative property is associated with the element *out*. The presence of the prepositionally dressed MP *by five pounds* correlates with the presence of *out*.

I take the element *out* in *outweighed* to be a particle. In line with various analyses of verb-particle structures, I assume that the particle starts out as a predicate in a small clause configuration (see Kayne 1984, Hoekstra 1988, Den Dikken 1995).

- (63) Mary weighed [_{SC} her sister out]

The verb (*to weigh*) in combination with the small clause predicate (*out*) designates a state, where the small clause predicate specifies a point of termination (see Hoekstra 1988).²⁹ In informal terms, this point of termination corresponds to the point on the scale of degrees (of weight) at which Mary's weight exceeds ('is bigger than') her sister's.

The small clause analysis in (63) is compatible with the observation that small clause (resultative) predicates license the appearance of an argumental noun phrase after an intransitive verb (Kayne 1984, Hoekstra 1988). This argument-licensing role of a resultative predicate is exemplified in (64); examples taken from Hoekstra (1988).

- (64) a. The joggers ran the pavement **(thin)*.

²⁹ The idea that *to weigh* in (63) selects a small clause *predicate* makes this instance of *to weigh* quite similar to the measure verb *to weigh* in *John weighed fifty pounds*, in the sense that *fifty pounds* is a *predicate* nominal (see Schwarzschild 2005, Corver 2009).

b. He cried his heart *(out).

Consider now the minimal pairs in (65) and (66):

- (65) a. *Mary lived her husband.
b. Mary outlived her husband.
(66) a. *Costs ran the budget.
b. Costs overran the budget.

These examples show that the argumental noun phrase after the verb is permitted only if the verb is accompanied by a particle. This suggests that the particles *out* and *over* in (58) and (59) fulfill the same role as *thin* and *out* in (64); that is, *out* and *over* are small clause predicates.

Having given some reasons for analyzing the particles *out* in (58) and *over* in (59) as small clause predicates, I will now address the question as to how the particle ends up in a position adjoined to the verb. In line with Hoekstra's (1988) claim that small clause particles can be affixal (see also Hoekstra and Mulder (1990), I propose that these particles have an affixal status. In Hoekstra's terminology, they are 'morphological predicates'.³⁰ In order to avoid a violation of the Stray Affix Filter—the requirement that syntactic affixes must be affixed to some host; Lasnik (1981)—the affixal small clause predicate must incorporate into the verb, yielding a complex verb.³¹

Let us now turn to the distribution of the measure phrase and the element *by*. Following the line of reasoning in section 5, I analyze *by* as a functional head on the verbal projection line which has MP in its specifier position. I further take the entire verbal chunk (*outweighed her sister*) to have a comparative meaning as a result of particle incorporation; the meaning of the verb 'to outweigh' corresponds to 'to weigh more than'.

(67) [_{PP} five pounds [_{P'} by [_{out_j+weighed} [_{SC} her sister t_j]]]]]

The word order *Mary outweighed her sister by five pounds* can now be derived as follows: *by* raises to a higher functional head (*W*) and the verbal chunk *outweighed her sister* is moved to the Spec-position of *by+W*. The pertinent derivational steps are given in (68):

- (68) a. E-merge of *W*
W [_{PP} five pounds [_{P'} by [[_{out_j+weighed_i}] [t_i [_{SC} her sister t_j]]]]]]]
b. I-merge of *by* (i.e., head movement to *W*)
by_k+W [_{PP} five pounds [_{P'} t_k [[_{out_j+weighed_i}] [t_i [_{SC} her sister t_j]]]]]]]
c. I-merge of verbal chunk (Prt+V plus small clause complement)
[_{WP} [_{out+weighed} her sister]_f by_k+W [_{PP} five pounds [_{P'} t_k t_f]]]

So far, I have shown that the MP-alternation pattern featuring a dressed MP (i.e. *by+MP*) can be derived by the same derivational process as was found in the adjectival domain (*too*

³⁰ Hoekstra (1988) gives Dutch *be-* as an example of a morphological (small clause) predicate that incorporates into the verb. The bound morpheme *be-* has a resultative meaning in the following construction: *Jan be-drinkt zich* (litt.: Jan BE-drinks himself, 'Jan gets drunk'). Hoekstra assigns the following base structure to this sentence: [*Jan drinkt* [_{SC} *zich be-*]]. For English, Hoekstra mentions *en-*, as in *to encamp* ('provide with a camp') and *to enchain* ('provide with chains'), as an example of a morphological (small clause) predicate.

³¹ I leave the analysis of the verbs in (60)-(61) for future research. Possibly, prefixes such as *a-*, *cur-*, *ex-*, *in-* are also small clause predicates underlyingly.

tall by 3 inches) and the nominal domain (*my senior by 2 years*). Recall that the latter two constructions had a counterpart in which the MP precedes rather than follows the "comparative part" of the construction: *2 years my senior* and *three inches too tall*. One would expect then that such patterns in which the MP precedes the "comparative part" are also possible in the verbal/clausal domain. As shown in (69), however, this word order is completely impossible, both with and without *by*:

- (69) a. *Mary (*by*) *many years outlived* here husband.
 b. *Mary (*by*) *one hour overslept* her alarm.
 c. *I (*by*) *five years exaggerated* my age.
 d. *They have (*by*) *3000 words abridged* the book.

The question, obviously, arises as to what rules out these patterns? Under the assumption that there is a single base position for modifying MPs in the clausal domain—that is, bare MPs and prepositionally dressed ones do not have structurally different base positions—the postverbal dressed MP and the preverbal bare MP have the same structural locus in the clause. Recall that this uniform base hypothesis was at the basis of my analysis of MP-alternation in the adjectival and nominal domain. Now if the base position of MP is the spec-position of (silent) *BY*, we have the "starting" structure in (67), repeated here as (70):

(70) [_{PP} five pounds [_{P'} by [_{out_j+weighed} [_{SC} her sister t_j]]]]]

Under the assumption that clausal subjects find their origin VP-internally, as proposed by Koopman and Sportiche (1991), then (70) can be more precisely represented as (71):

(71) [_{PP} five pounds [_{P'} by [_{VP} Mary [_{v'} out_i+weighed [_{SC} her sister t_i]]]]]]]

I assume that, if the MP (*five pounds*) precedes the string *outweighed her sister*, this string has not been moved to the specifier position of WP at any point in the derivation. In other words, the string *Mary outweighed her sister* remains *in situ*. This means that (71) is the structural configuration from where the subject (*Mary*) is moved to Spec,TP. This displacement is represented in (72):³²

(72) [_{TP} Mary_j [_{T'} T [_{PP} **five pounds** [_{P'} BY [_{VP} t_j [_{v'} out_i+weighed [_{SC} her sister t_i]]]]]]]]]

In this representation, the nominal subject *Mary* raises over the *in situ* nominal MP *five pounds*. This movement of the subject across the MP causes a violation of Relativized Minimality (Rizzi 1991) or, in a more recent reinterpretation of this constraint, a violation of the Minimal Link Condition (Chomsky 2000:122).

In the alternative word order *Mary outweighed her husband by 5 pounds* there is no violation of Relativized Minimality (or MLC). For seeing this, consider again the derivational steps in (68), especially (68c). Under the assumption that subject noun phrase (*Mary*) starts out VP-internally, (68c) can be more precisely represented as (73).

(73) [_{WP} [_{VP} Mary out+weighed her sister]_f by_k+W [_{PP} five pounds [_{P'} t_k t_f]]]

³² In more recent years, it has been argued that the subject does not originate in the specifier position of the lexical projection VP but rather in the Spec-position of a light verb (*v*⁰), which takes the lexical VP as its complement (see Kratzer 1996, Chomsky 1995). If one adopted this analysis, *by* in (72) would select *vP* instead of *VP*. The gist of the Relativized Minimality analysis given in (72) remains unchanged, however.

The displacement operation that moves VP to Spec,WP smuggles the VP-internal subject noun phrase *Mary* across the MP *five pounds* in Spec,PP. Being embedded in VP (the smuggler), the VP-internal nominal subject (the smugglee) is invisible for the nominal MP in Spec,PP. After having been smuggled across MP, the subject *Mary* leaves the displaced VP and gets moved to Spec,TP. Schematically:

(74) [TP $Mary_i$... [WP [VP t_i out+weighed her sister]_f by_k+W [PP five pounds [_{P'} t_k t_f]]]]

This analysis of the contrast between the well-formed *Mary outweighed her sister by five pounds*, on the one hand, and the ill-formed *Mary (by) five pounds outweighed her sister*, on the other, reminds us of the contrast in Italian given in (33), and repeated here as (75):

(75) Gianni ha <'con rapidità> risolto il problema <con rapidità>.
Gianni has with rapidity solved the problem`

Recall from the discussion in section 4 that placement of the adverbial PP in between the auxiliary and the participle gives rise to marginality due to a violation of Relativized Minimality, caused by movement of the VP-internal subject across the (PP-internal) noun phrase *rapidità*. The word order variant with postverbal *con rapidità* is fine, because the subject *Gianni* is smuggled across *con rapidità* by displacement of the entire VP. The subject is subsequently moved to Spec,TP.

As Belletti and Rizzi (2012) point out, the intervention effect is really caused by the categorial nature of the "complement" of P, and not by PP. They give the following minimal pair:

(76) a. Gianni ha <di nuovo> mangiato la pasta <di nuovo>.
Gianni has of-new (again) eaten the pasta
b. Gianni ha <?'* di corsa> mangiato la pasta <di corsa>.
Gianni has of-run (rapidly) eaten the pasta

In (76a), the adverbial PP contains (presumably) an adjective (*nuovo*) and the interposition between the auxiliary and the past participle is as natural as the corresponding *-mente* adverb in (31). As shown by (76b), interpolation of the adverbial PP yields a marginal result when the PP contains a noun (*corsa*).

Interestingly, a similar contrast can be found in English. As was shown by the examples in (69), an MP —prepositionally dressed or bare— cannot occur in preverbal position. However, as shown by the examples in (77) and (78), which are drawn from English texts on the internet, the main verb can be preceded by the prepositionally dressed modifier *by far* and the bare modifier *far*.^{33 34}

(77) a. Her award-winning story of how she *far outlived* her doctors' prediction inspires each of us to love, laugh and live life to the fullest.

³³ My informants do not fully accept all examples in (77)-(78). Furthermore, there is interspeaker variation. However, they all agree that preverbal *(by) far* is much better than preverbal MP, as in (69).

³⁴ The modifier *(by) far* is also found with the other patterns discussed earlier, as in *John is <far> too tall <by far>*, and *John is <far> my senior <by far>*. Notice that *(by) far* is also found in patterns featuring a superlative (attributive) adjective, as in: *This is <by far> the best painting <by far>*. I leave the analysis of the latter pattern to future research.

- b. In fact, the tortoise *far outlived* its original owner, who was beheaded in 1645 during the civil war.
- c. Cahoun argues that Upper Mississippi locks have *far outlived* their 50-year design-life.
- d. Her influence was sweeping and her legacy *far outlived* her.

- (78)
- a. The benefits *by far outweighed* the challenges or disadvantages.
 - b. Given just a few years to live after being diagnosed with ALS at age 21, Stephen Hawking *by far outlived* that, reaching the age of 76.
 - c. Travis's self-esteem *by far outran* his ability.
 - d. Recent technological shifts have *by far increased* the availability of Yiddish books to the average Yiddish-reading buyer.

I take the element *far* to be an adjectival element. For sure, it is an adjectival element with special syntactic behavior. For example, it cannot be combined with the degree word *very*, as shown by *She (*very) far outlived her doctor's prediction*. Furthermore, its co-occurrence with a prepositional element (*by*) is rather special given the fact that adjectival expressions typically do not combine with prepositions. It should be noted, though, that there are other adverbial expressions having the “surface structure” P + AP, such as *for long*, *for sure*, and *in short*.³⁵ I tentatively propose that *by far* is a fixed unit, possibly stored in the lexicon as a complex lexical unit or derived by some morphological merger rule that combines (and reorders) the bare adjective *far* in Spec,PP and the preposition *by*, which heads PP.

Under the assumption that *far* is an adjectival expression, the structural representation that corresponds to the sentence *Mary far outweighed her sister* looks like (79):

- (79) [TP *Mary*_j [T' T [PP **far** [P' BY [VP t_j [V' out_i+weighed [SC her sister t_i]]]]]]]]

The element *far*, being an adjectival expression, does not act as an intervener for the subject noun phrase *Mary* that raises from Spec,VP to Spec,TP.

Let me finish this section with a brief discussion of a contrast between the clausal construction in (80a), on the one hand, and the adjectival and nominal constructions in (80b,c), on the other hand, namely: MP can precede the nominal expression *my senior* and the adjectival expression *too tall* but it cannot precede the verbal expression *outlived her husband*. For the sake of completeness, I added the postverbal *by*-phrases, which are all grammatical.

- (80)
- a. Mary <*many years> outlived here husband <by many years>. (see (69a))
 - b. John is <ten years> my senior <by ten years>.
 - c. John is <two inches> too tall <by two inches>.

The question arises what underlies the asymmetry between (80a) and (80b,c). Recall that the ill-formedness of (80a) with preverbal MP was analyzed as a Relativized Minimality violation: the subject *Mary* raises from a VP-internal subject position to Spec,TP, and, on its way to Spec,TP, it crosses the intervening MP. But if the subject *John* in (80b,c) also has its origin in the Spec-position of a lexical projection (NP, AP), one would expect to find a similar intervention effect. Take, for example, the derivation of (80c), if one starts from the

³⁵ Note that *long* can be modified by *very*, as in *He didn't stay for very long*. Patterns such as *for very sure* and *in very short* are impossible.

assumption that *John* originates in Spec,AP. Movement of *John* to Spec,TP would cross the nominal measure phrase *two inches*, as represented by (81):

(81) [_{TP} John_i was [_{PP} **two inches** [_{P'} (by) [_{DegP} too [_{AP} t_i [_{A'} tall]]]]]]]

The structural configuration in (81) is similar to the one in (72), where the VP-internal subject *Mary* crosses the measure phrase *five pounds*. Consequently, one would expect (81) to be ruled out as well, due to a violation of Relativized Minimality. However, the sentence *John was two inches too tall* is perfectly fine. Possibly, then, the subject (external argument) of *tall* does not have its base position in the lexical projection AP, but rather, in a slightly higher position; more specifically, a position that structurally c-commands MP.

Sentences containing a small clause complement indeed suggest that the external argument of the adjective is base-generated in a position external to the lexical projection AP. Consider the following examples:

- (82) a. I got carried away and made [_{SC} *the sleeves about four inches too long*], but that's an easy fix.
 b. The first bivy sack that I made was coated nylon bottom and Goretex top, but I made [_{SC} *it a few inches too short*].

In these examples the verb *made* elects a Small Clause complement. In this SC, the subject argument (*the sleeves/it*) precedes MP and the degree word *too*, and, thus, is clearly located in a position external to the lexical projection AP.

Also for the construction in (80b), evidence can be given that the subject argument has a base position which is located outside the maximal projection of the lexical head (N). The evidence comes again from small clause configurations. Consider the examples in (83):³⁶

- (83) a. My immediate family is large. I am the youngest of six siblings [with [_{SC} *the eldest eighteen years my senior*]].
 b. Ms. DeMarco, who described [_{SC} *her husband as* [[14 years her senior] and [twice divorced]], said that she, too, agreed not to have children.
 c. He definitely did not see [_{SC} *her as ten years his senior*].

Example (83a) shows us an absolute *with* construction, in which *the eldest* is the subject of the complex predicate *eighteen years my senior*. Clearly, the subject is external to the complex nominal predicate. Examples (83b,c) also show that the subject (*her husband, her*) is located outside the maximal projection of the nominal predicate. The linking element *as*, which connects the subject and the nominal predicate, clearly separates the subject from the complex predicate.

On the basis of the data in (82) and (83) I conclude that the subject argument of the (nominal or adjectival) predicate is located in a structural position outside the maximal projection of the lexical head (N, A). Following Bowers (1993) and Den Dikken (2006), I take this subject position to be the specifier position of a functional head that takes the (small clause) predicate as its complement; see Bowers's Pred-head and Den Dikken's Relator head.

³⁶ This empirical argument against generating the SC-subject within the lexical projection (NP) is reminiscent of the argument given in Bowers (1993:593) based on sentences such as *She considered Peter her best friend*, where *her* is the specifier of the predicate nominal. See also Den Dikken (2006:19).

The derivation of *John was two inches too tall* and the derivation of *John is ten years my senior* can now be represented as (84a) and (84b), respectively:

- (84) a. [TP John_i was [PredP t_i [Pred' Pred_o [PP two inches [P' BY [DegP too [AP tall]]]]]]]
 b. [TP John_i is [PredP t_i [Pred' Pred_o [PP ten years [P' BY [my senior]]]]]]

Clearly, the subject noun phrase *John* does not cross MP on its way to Spec,TP.

8. MP alternation in the prepositional domain

So far we have seen that, in English, MP alternation is a phenomenon attested in the adjectival domain (39) and nominal domain (49), and that, in the clausal domain, nominal measure phrases typically occur in a position following the verb, as in (58)-(59). Our examination of MP-alternation in these phrasal domains leads to the following question: What about MP-alternation in the English adpositional domain (PP)?

In Jackendoff (1977:140), it is observed that, within the English prepositional domain, MPs can occur in a position preceding the preposition and its complement, as in (85a), but also in a position following the preposition and its complement, as in (85b).³⁷

- (85) a. [Three miles down the road] there is a gas station.
 b. [Down the road three miles] there is a gas station.

Jackendoff analyzes the word order variation in (85) in terms of free base-generation of the MP; specifically, *three miles* can be a base-generated left-branch specifier or a base-generated right-branch specifier. Under the assumption that there is a single base position for MPs, as argued for in previous sections, I propose that one word order pattern represents the base structure, viz., (85a), and the other one, i.e. (85b), the derived word order.

Before turning to the analysis of the word order alternation in (85), I will discuss some properties of the adpositional construction in (85b). Let me start by giving some additional examples of the word order pattern P + noun phrase + MP. The examples are drawn from English texts available on the internet:

- (86) a. *Behind the cottage about 100 meters* was the Winery Cantina where they would bring in tourists, do wine tastings, and serve a delicious 3 course dinner with the tasting.
 b. By 11 a.m., a parking turnout *down the road a few miles* was full of cars with various boats strapped to trailers and a small crowd of wide-eyed and nervous boaters who swapped advice and stories as they pulled on their wetsuits and helmets for another day of battle.
 c. This stop will not have the usual array of fruit and other foods you may be used to but you will find those *down the road a few more miles* at Valley Ford.
 d. They traveled *up the river about 150 miles* to what is now Albany, before deciding that it would not lead all the way to the Pacific and turning back.

The constituency of the string 'P + noun phrase + MP' is clear from a number of facts. First of all, it can be fronted to clause-initial position, as in (85b) and (86a). Secondly, it can

³⁷ As noted in Jackendoff (1977:141-42), we find this alternation also with adjectival modifiers, as in <too far> down the road <too far>.

function as a modifier within a noun phrase, as in (86b), where *a parking turnout down the road a few miles* functions as a subject noun phrase. Thirdly, it can function as the predicative phrase in a cleft construction, as in (87). Finally, as exemplified by (88), it can occur as an independent phrase, used as an answer to a wh-question. Note that these same examples show that the string MP + P + noun phrase also forms a constituent.

- (87) It was [*<about ten miles> down the road <about ten miles>*] that I met her.
 (88) A: Where did he go?
 B: [*<200 miles> up the river 200 miles <200 miles>*]

The attentive reader will have noticed that the MP following P + noun phrase is bare. That is, the prepositional element *by* is absent. However, as shown by the following examples taken from English texts, it is possible (for certain speakers) to have the element *by* in between the sequence P + noun phrase and MP.³⁸

- (89) a. *Just down the road by about 15 minutes* you'll discover FDR's Presidential Library and the only federally protected home of a First Lady, Eleanor Roosevelt's home/cottage Val-Kill.
 b. *Just down the road by 20 minutes* is Newport News and Norfolk is about a 50 minute drive.
 c. Laura Ingalls Wilder Elementary school (excellent Littleton Public Schools district) is *just down the road by about 5 minutes*.
 d. I could feel the landing gear come off the ground, and we remained *just above the runway by a few feet* for what felt like ten seconds, then it hit us.

Notice that (89a,b) clearly shows the constituency of the italicized strings. The strings appear in clause-initial position in both sentences.

Building on recent analyses of the extended adpositional projection (see Koopman 2000b, Den Dikken 2010, Svenonius 2010) and following the approach towards MP-alternation adopted so far, I propose that there is a unique position for MP in the extended adpositional projection. I take this position to be the Spec-position of the functional element *by*. Schematically:³⁹

- (90) [_{PP} 20 minutes [_{P'} BY [_{DP} down the road]]]

As shown in (90), the pre-adpositional measure phrase can occur in combination with the modifier *right*, which contributes some sort of emphasis to the space expressed by the adpositional phrase:

- (91) a. We asked the receptionist how far we were from the Falls and she said: "They're *2 minutes right down the road* — you can't miss them."
 b. Outfielder Jason Morozowski went to Mount Olive [North Carolina], which is *about*

³⁸ For some of my informants the examples in (89) have an intermediate status on the acceptability scale (??). However, they consider *by+MP* in post-'P+DP' position to be much better than in pre-'P+DP' position. Thus, *by about 15 minutes just down the road* (compare (89a)) is completely impossible. The *by*-less string *about 15 minutes just down the road* is perfectly fine.

³⁹ Jespersen (1977:248) argues that prepositions such as *after* and *before* must also be considered as 'latent comparatives'. For example, *John arrived after Mary* implies that John arrived *later than* Mary. Recall that I have argued that measure *by* selects a phrase encoding the idea of comparison. Interestingly, as noted by Jespersen, *after* even formally shows a sign of comparison: *aft-er*.

45 minutes right down the road.

Following Koopman (2000b) and Den Dikken (2010), I analyze *right* as a degree head, which brings us to the following analysis of the italicized string in (91a):⁴⁰

(92) [PP 2 minutes [P' BY [DegP [Deg right] [PP down the road]]]]

Observe now that, besides the pattern *MP + right + P + noun phrase*, we also find the pattern *right + P + noun phrase + MP*:

- (93) a. There is a great little park *right down the road about two minutes* that serves drinks and some light food while you watch your kids play.
b. There's a Mickey D's *right down the road another two miles or so*.
c. There is a guy *right down the road about 2 miles* who has a yard full of pallets.

I propose that the derivation of the (italicized) word order variant in (93) is similar to the one proposed for adjectival, nominal and clausal expressions featuring a (dressed) MP at the end of the phrase. Specifically, DegP (e.g. *right down the road*) undergoes leftward movement to Spec,WP:

(94) [WP [DegP right down the road]_i [W' by_j+W [PP about 2 miles [P' t_j t_i]]]]

The question, of course, arises as to why *by* can, and for certain speakers must, be absent. At the moment, I have no answer to this question, although the fact that an extended adpositional projection (*right down the road*) occupies the specifier of the amalgam *by+W*, which also features a prepositional element, may play a role.

9. Conclusion

In this chapter, the phenomenon of MP-alternation in English was studied from a cross-categorical perspective. It was proposed that MP has a fixed position, namely the specifier position of *by/BY*, and that word alternation results from leftward movement of a phrasal constituent past MP to the specifier position of a higher functional head. For the clausal domain, the contrast between the well-formed pattern *V by+MP* and the ill-formed **MP V* was observed. The ill-formedness of the latter pattern was accounted for in terms of Relativized Minimality. Specifically, movement of the VP-internal subject across MP violates locality of movement. The well-formedness of the former pattern resulted from Smuggling: the VP-internal subject is smuggled across MP. It was further proposed that the pattern *MP+Head* is permitted in other domains (e.g. adjectival, nominal) due to the fact that the subject of a nominal/adjectival expression is base generated in a position hierarchically higher than MP.

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⁴⁰ That *right* is located in a different (functional) projection than MP is, is suggested by the fact that *right* can occur in adpositional environments where MP is blocked: e.g., *He pointed a gun right between my eyes* versus **He pointed a gun 2 inches between my eyes*.

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