

English particle verbs as complex heads: Evidence from nominalization

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1. Introduction

There is much literature and little consensus on structure of particle verbs (otherwise known as phrasal verbs, verb-particle constructions) such as *take out*. One approach in the literature is sometimes called the **complex head approach** (e.g. Dehé 2002, Farrell 2005, Haider 1997, Harley & Noyer 1998, Johnson 1991, Neeleman 2002, Olsen 1997, 2000, Stiebels & Wunderlich 1994, Toivonen 2003, Zeller 2002). It claims that the verb and particle can, under certain circumstances, form what might variously be called a compound, a morphological object, a complex word or a single head of the form $[V^\circ V P]$. (1) and (2) illustrate different variants of this approach, respectively modelled on Farrell's (2005) flat VP approach and Haider's (1997) VP shell approach. In both (1a) and (2a), the particle has the same external syntax as a normal transitive PP like *into the garage*. In the (b) variants the particle verb is a complex head. In (1b) it is assumed to be inserted as a compound, while in (2b) the particle is initially inserted as a PP but incorporates into V by head movement à la Baker (1988), so that V+P form a complex head for verb movement purposes. A variant of this approach is to assume that the particle and verb in (2b) can reanalyse as morphological structures (Zeller 2002). Complex head approaches easily explain the fact that particles are the only elements in English which can appear between verbs and (non-extraposed) objects. The inability of modified particles to undergo particle shift, cf. (3), is also expected since modified elements are generally ill at ease in compounding/incorporation structures: $[_{PP} (*right) over]turn the cart.$ ¹

- (1) a. She $[_{VP} [V^\circ \textit{pushed}] [_{DP} the car] [_{PP} in]]$
b. She $[_{VP} [V^\circ \textit{pushed in}] [_{DP} the car]]$
- (2) a. $[_{VP} She [_{V'} [V [V^\circ \textit{pushed}] + V] [_{VP} the car [V' t_{push} [_{PP} in]]]]]$
b. $[_{VP} She [_{V'} [V [V^\circ \textit{pushed in}] + V] [_{VP} the car [V' t_{push in} [_{PP} t_{in}]]]]]$
- (3) a. *She pushed the car straight in.*
b. **She pushed straight in the car.*

However, the complex head approach does not have a mortgage on explaining these facts. Among various alternatives surveyed in Dehé et al. (2002) and Haiden (2006), one could name an approach which assumes that the particle and object form a Small Clause or comparable constituent (e.g. den Dikken 1995, Svenonius 1996). (4) gives the variant of this approach in Ramchand & Svenonius (2002). Here the word order alternation takes place entirely within the Small Clause, here conceived as a projection of a R(esult) head, which can either attract a DP to its specifier, (4a), or trigger head movement of a particle, (4b). This can capture data like (3) by assuming that modified particles are not analysable as heads (modulo the complication in note 1). The approach, unlike the $[V^\circ V P]$ approach, readily extends to languages where some constituent intervenes between V and a pre-object particle, cf. (5) and (6).

- (4) a. *push* $[_{RP} the car [_{R'} R [_{PrtP} t_{the car} [_{Prt} in]]]]$
b. *push* $[_{RP} [_{R'} in + R [_{PrtP} the car [_{Prt} t_{in}]]]]$
- (5) Kari *sparka* heldigvis *ut* hunden. [Norw. Ramchand/Svenonius]
K. kicked fortunately out the.dog
- (6) Hon *sparkade* inte *ut* honom. [Swedish, Toivonen 2003:43]

¹ Olsen (2000) objects that head movement wrongly predicts stranding of modifiers and complements: **push in the car* $[_{PP} right t_{in}]$; **push in the car* $[_{PP} t_{in} the garage]$. To meet this objection one would have to assume that modified and transitive P-items, but not particles, have additional functional structure which blocks incorporation. This may be right, but its implementation is not obvious. This problem is sidestepped in theories which assume that the complex head arises by base-generation or reanalysis.

she kicked not out him

The constituent [_{V°} V P_{rt}] assumed in complex head analyses should not be accepted lightly. Several extant arguments for it are inconclusive. For instance, Farrell (2005: 103) sees the mere existence of cases of affixation of particle verbs as an argument for [_{V°} V P], but evidence for syntactic word formation (say Fu et al. 2001, Baker & Vinokurova 2008, Bruening 2012) cautions us against uncritically accepting the No Phrase Constraint. [_{V°} V P] is left-headed, unlike most other morphological structures in English. While it is possible that at some stage in the history of English purely syntactically generated verb-particle strings were reanalysed by language learners as morphological structures, this should not be the default assumption given that English morphology is otherwise nearly always right-headed.

I will nonetheless argue that [_{V°} V P] exists. After reviewing and extending an argument from the literature from quotative inversion (*‘Go away dude!’ shouted out Marmaduke*), I present several arguments connected with nominalizations of particle verbs. Section 3 discusses reduplicative nominalizations of the type *fixer-upper*, arguing that the outer suffix is needed because *-er* takes a whole [_{V°} V P] as input, and providing other remarks on this pattern needed in later sections. Section 4 adduces an argument for [_{V°} V P] based on the fact that event nominals with *-ing* but not with other suffixes are compatible with particles: *the {dividing/*division} up of the country*. In section 5 I mount an argument for [_{V°} V P] which is based on a previously unstudied synthetic compounds of the type *house-fixer-upper*

2. Preliminary argument: Quotative inversion

As an appetite-whetter for my main arguments for [_{V°} V P], I now present an elaboration of a little-known argument in the literature. It is based on the appearance of the verb and particle in pre-subject position in quotative inversion (Collins & Branigan 1997:4f, Toivonen 2003:175f):

- (7) a. “Civilization is going to pieces,” **broke out** Tom violently. [attested; Toivonen]
- b. “Out with it” **blurted out** the Captain brusquely. [Cappelle 2010]
- c. “What!?” **shouted out** John and Yuuda simultaneously. [Google]

Collins & Branigan (henceforth C&B) argue that quotative inversion has the structure in (8) (which I have updated by substituting T for Agr, _vP for VP). Here Op is an empty operator coindexed with the quote (it being hard to defend an analysis involving movement of discontinuous quotes like that in (8)).

- (8) “Why” [_{CP} Op [_{TP} [_{T°} [_{V°} shouts out]] [_{VP} Bill ... t_{shout out} t_{Op}]]] “did you do that?”

C&B argue that the subject is in its initial position (here spec,_vP) and not extraposed. An extraposition analysis makes it hard to explain why the subject cannot appear after the PP in (9a). These contrast with *bona fide* cases of subject extraposition like (9b), which are only possible with heavy subjects.

- (9) a. *‘Get lost!’ shouted at him [a man].
- b. ‘Get lost!’ shouted at him [a man in a bedraggled brown suit].

The elopement of particles with verbs to pre-subject positions in (7) is all the more striking given that other verbal dependents cannot do so, cf. (10)a,b). This is not predicted if we analyse (7) in terms of movement of a VP remnant to a pre-subject position. Such an analysis would also have to explain why the *to*-PP in (10)c) is not part of the remnant. These problems do not arise if we assume that structures like (7) involve head movement of [_{V°} V P] to a pre-subject position, an assumption which also explains why modified particles cannot appear here, cf. (10)d).

- (10) a. ‘Get lost!’, **shouted {*at him/*loudly}** Gertrude.
- b. ‘Get lost!’, shouted Gertrude at him loudly.
- c. ‘Get lost!’, **shouted out** Gertrude to Basil.
- d. ‘You’re a crypto-lexicallist!’, **shouted (*straight) out** Gertrude to Basil.

Thus, [_{V°} V P] gives us the best hope of analyzing quotative inversion. The facts we have seen certainly need to be addressed by those who reject the complex head analysis.

3. Reduplication nominalizations (*fixer-upper*)

We turn now to nominalizations as a source of arguments for [_{V°} V P]. Some such arguments involve the affix reduplication phenomenon seen in (11). This construction is well-attested on the internet, though its text frequency is curtailed by its confinement to a subset of English idiolects and to colloquial style. Use in higher style levels is unlikely since purportedly ‘redundant’ formatives are a sitting duck for purist invective like that in Wentworth (1936).

(11) *fixer-upper*, *taker outer*, *filler-inner*, *writer downer*, *taker offer*, *turner-overer*

While we noted in the introduction that nominalization of particle verbs is not *in itself* an argument for [_{V°} V P], the appearance of the affix to the right of the particle in (11) is most plausibly explained if the particle is part of the V which undergoes affixation, since we do not find reduplication of affixes when a nominalized verb occurs with clearly phrasal arguments (*pusher of cars*, *travellers to Spain*). This argument holds irrespective of whether one executes –*er* affixation in a lexicalist-style derivation with realization of phrasal arguments as arguments of the derived noun (e.g. Grimshaw 1990) or in a syntactic derivation where –*er* is a syntactic head which selects a VP or larger constituent and attracts V (including [_{V°} V P]) in a head movement operation (e.g. Baker & Vinokurova 2009).

Reduplication occurs because a suffix must attach to right of its input but for some reason must also attach to the head of its input. A single suffix cannot fulfill both requirements with left-headed input. Web-attested data like (12) give another example of the same phenomenon. The inputs to plural affixation are treated as left-headed nominal compounds in the relevant idiolects. Stump (1994) discusses a similar case of plural affix reduplication in Breton left-headed diminutives.

(12) %*sisters-in-laws*; %*governors-general*s; %*attorneys-general*s

It is less clear why speakers’ grammars feel the need to attach affixes to the head of their input in addition to the right edge of their input. Possibly this is because heads of morphological objects are stems subject to valuation by functional heads like Tense, and are in themselves not fully formed morphological words (which is not visible in weakly inflected languages like English). Derivational suffixes solve this problem in right-headed structures but cannot do so in left-headed structures where nonhead material intervenes between the suffix and the head of the input. Whether or not this is right, it is clear that the inner affix is inserted for morpho-phonological reasons, since web-attested cases like (13)a) speak for the semantic vacuity of the inner affix (cf. Miller 1993:133; Cappelle 2010). Moreover, the inner affix is expendable when it would violate other constraints. Thus, a phonologically heavy affix like –*able* is better attested on the internet without inner affixation, as in (13)b), than with it (*fixable-uppable*), presumably because reduplication produces too much phonological clutter.

(13) a. *breaker-up-ee* “one who is broken up with by their partner”; *eye-putter-outee* “one whose eye is put out”; *pisser-off-ee* “one who gets pissed off”

b. *fix-up-able*, *take-out-able*, *piss-off-able*

c. *passer-by*, *hanger-on*, *runner-up*

d. ...*an act-getter-together* (*act-getter-togetherer? you know, someone to help me get my act together*). [Google; March 2009]

In a third response to the problem of suffixing left-headed structures, the suffix is realized only on the head of its input. This is seen in examples like (13)c), which strike me as memorized relics of a now unproductive pattern (which was replaced by reduplication in the twentieth century, Cappelle 2010). This pattern seems to be the least acceptable of the three seen so far, with the possible exception of particles ending in <er>, where the outer –*er* is prone to

haplology, witness (13d) and the fact that the string “tipper-over of” yields eleven Google hits while “tipper-overer of” yields none. By contrast this strategy is usual with inflectional affixes (*I walked in*), adjectival participial suffixes (*{fallen/falling} down houses*) and the nominalizer *-ing* (see also footnote 2).

The three solutions to the problem of suffixing left-headed morphological objects (called *double affixation*, *head marking* and *external marking* in Stump (1994)) are all suboptimal: only reduplication satisfies all morphophonological requirements but is uneconomical and apt to be stigmatized sociolinguistically. It is thus unsurprising that some speakers accept none of the three strategies. For instance, a British linguistics graduate whom I asked to nominalize *take out* suggested *out-taker*, but found it ‘very marginal’. He volunteered neither *taker-outer* nor *taker-out* nor *take-outer*, and rejected them all when I asked him about them.

I now discuss the account of Svenonius (2004), who does not see reduplication as a response to inflecting a left-headed [_V° V P]. He argues that *-er* merges twice because it binds both the external and internal arguments. By comparison, there is only one *-able* in the (commonest) pattern in (13b) because *-able* only binds an external argument. Unfortunately this appealing idea does not find the empirical support it deserves. We find reduplication even if the internal argument is realized (*fixer uppers of cars*) or if there is only one argument (*walker-outer*). A final point to notice is that some speakers use tripple-*er* (*fix-er up-er-er*; see Cappelle 2010), though presumably the affix is not binding three arguments here.

The remarks given above (and in footnote 2 and section 5) do not capture all the complexities of the reduplication phenomenon noted in Cappelle (2010) and Walker (2009), but I hope to have at least shown that the attachment of affixes to the right of particles in (11) puts the explanatory onus on those who believe we would be better off without [_V° V P].

4. Fussy affixes: **the explanation away of problems*

This section will propose an argument for [_V° V P] which is based on data like (14)-(17). Comparison of the (a) and (b) variants suggests that the nominalization affix *-ing* is compatible with particles, while other affixes (call these **fussy affixes**) are incompatible with particles. Comparison of the (a) and (c) variants suggests that the incompatibility of fussy affixes with particles does not extend to full PPs. (In (18) the data are abbreviated; the corresponding *-ing* nominals are well-formed with particles, as in the (b) variants in (14)-(17)).

- (14) a. *the **division up** of the country
b. the dividing up of the country (into two)
c. the division of the country into two
- (15) a. *the **merger in** of the company
b. the merging in of the company
c. the acquisition of Rodocker’s, or **merger of it into our company** [www]
- (16) a. *the **enticement in** of the people
b. the enticing in of the people
c. the **enticement** of people into a hall [www]
- (17) a. *the **growth up** of children
b. the growing up of children.
c. the **growth** of children **into powerful adults** [www]
- (18) a. the **shipment** {***off**} (of the goods) {to Europe} (last week)
b. the **leakage** {***out**} of water {out of the tank}
c. the **clearance** {***out**} of the goods {out of the factory}
d. the **closure** {***down**} of nuclear power plants
e. the **trial** {***out**} of the products

f. the **explanation** { *away } of the problem

The generalization emerging from these data can be stated more precisely as follows.

(19) **PARTICLE-AFFIX GENERALIZATION (PAG):** Verb particles, but not full PPs, are incompatible with nominalizations with the following properties:

a. The nominalization is a **complex event nominal** (Grimshaw 1990), i.e. is an event nominalization with an argument introduced in an *of*-phrase which corresponds to a direct object or unaccusative subject of the corresponding clause.

b. The nominalization contains an overt affix other than *-ing*.

The PAG as formulated in (19) does not refer to certain types of nominalizations which are found with particles. (19)a) excludes agentive nominalizations like those seen in section 3 (*fixer-up-er*). (19)b) confines the discussion to nominalizations with overt affixes. It says nothing about cases of conversion/zero derivation like *bailout*, *meltdown*, *stuffup*. For many speakers these do not conform to the condition in (19)a) anyway (%*the stuffup of the concert*).

4.1. My account: [_{V°} V P] is input to affixation

I will argue that the best explanation for the PAG, and thus the data in (14)-(18), has the ingredients put forth in points A to C below.

A) The verb and particle are forced form a complex head [_{V°} V P] in complex event nominalizations. The old observation that verb-adjacent particle placement is obligatory in *-ing*-nominals like (20) (e.g. Chomsky 1970) is consonant with this (though this is not *in itself* an argument for [_{V°} V P]). Since my account does not depend on an explanation for the obligatoriness of particle incorporation in complex event nominals, I will postpone such an explanation to section 4.3.

(20) *the dividing {up} of the country {*up}*

B) It follows from point A that the input to affixation in complex event nominals based on particle verbs is [_{V°} V P], and not just a simple V. I will clarify this point with regard to both lexicalist and syntactic approaches to affixation.

In a traditional lexicalist approach in which nominalising affixes attach to V°, my point would be that *the {dividing/*division} up of the country (into two)* involves attachment of the affixes to *divide up*. The DP and PP arguments selected by V are realized above affixation as arguments of the derived noun (e.g. Grimshaw 1990).²

Now consider non-lexicalist approaches which derive nominalizations by head movement (e.g. Alexiadou 2001, Baker & Vinokurova 2009, Borer 2003, Fu et al. 2001, Harley 2008). For our purposes the various differences between these approaches are unimportant, so I will illustrate

² That the particle is part of the input is perhaps unexpected given *[_{V°} *divide up*]-*ing*]. I must assume that *-ing* differs from reduplicating affixes like *-er* (section 3) in that it is only spelt out on the head of its input (cf. Stump's 1994 notion of *head marking*). Some varieties show overt evidence of such affixes attaching to both the stem and the whole particle verb, witness the following web attestations:

(i) %house-fixing-upping, %trash taking-outing

Such *-ing*-reduplication structures deserve more study. Noticeably many examples on Google featured incorporated nouns like (i). To me (i) is very degraded, but *house-fixing-up*, *trash-taking-out* are worse, despite the perfect acceptability of *taking out*, *fixing up* in their various inflectional and derivational uses without incorporated nouns. A perhaps related puzzle is that perfect participle affixes do not normally reduplicate (*I have walked out*; *folded up chairs*), but do for some speakers when adjectival participles undergo further affixation, cf. (ii) and Cappelle (2010). For varieties rejecting all such reduplications we are left with Wentworth's (1936) prescient question: "Why the evil genius of slang permits *-er*, but not *-ing* or *-ed* to be so misused [i.e. reduplicated, A.M.] is puzzling. Forms like *calling downing*, *thinking upping*, *dropped inned*, and *walked upped*, have not been observed."

(ii) %put-out-ed-ness, %grown-up-ed-ness, %screwed-up-ed-ness, %pissed-off-ed-ness

them using the simple structure in (21). The affix is a phonological spellout of a head, labelled N in (21), which selects a phrasal projection containing the arguments of V (be it VP or a larger functional projection). V undergoes head movement to N. My claim is that the V which raises to N in (21) is *divide up*, not merely *divide*.

(21) [NP N [VP/FP *divide up (of) the country into two*]]

C) Some fussy affixes in (14)-(18) are unproductive (say *-th* in *growth*), so we should not expect them to enter new combinations with particle verbs. Other fussy affixes are productive but impose constraints on the (types or tokens) of bases with which they combine, and it so happens that [_V° V P] does not conform to such constraints. I elaborate on the productivity and selection restrictions of fussy affixes in section 4.2, but for now note with Harley & Noyer (1998) that *-ing* imposes no constraints on the verbs with which it can combine and is thus called upon when no other affix is compatible with V, including cases where V is a particle verb.³

Putting the three points of my argument together, we can state that if particles can form complex verbs which serve as the bases of affixes, we can reduce the incompatibility of fussy affixes to their fussiness in other areas. If particles do not incorporate in nominalizations, we would expect fussy affixes to be as oblivious to particles as they are to full PPs, which is at variance with what we see in (14)-(18).

It remains to tie up some loose ends in the argument. Section 4.2 gives more detailed remarks on the constraints on the productivity and selection restrictions of fussy affixes. Section 4.3 completes points A and B by explaining why particle incorporation should be obligatory in complex event nominals. Section 4.4 describes problems with an alternative account of data like (14)-(18), which does not rely on particle incorporation, Sichel (2010).

4.2. More details on constraints on fussy affixes

The affixes other than *-ing* in (14)-(18) are not only fussy about particles. Even in the absence of particles they are either unproductive or subject to constraints limiting the (types or tokens) of bases with which they combine, while *-ing* is free of such constraints and can be regarded as an Elsewhere nominalizer (e.g. Harley & Noyer 1998). Let us apply this to the affixes individually.

The affix in *growth* is unproductive (Marchand 1969: 349). In current English *growth* is the only clear deverbal formation with this affix. Other formations are either derivationally opaque (*stealth* < *steal*), obsolete ([†]*spilth*) or deadjectival (*breadth*, *strength*, *width*). Since *-th* is unproductive, we should not expect it to be able to attach to *grow up*, hence (17).

Similarly, the affix in *merger* does not productively form complex event nominals. Marchand (1969: 273-281) makes no mention of an event-denoting reading of *-er* and while Ryder (1999: 294) names some *-er*-nouns which ‘refer to actions or events’ (*cliff-hanger*, *nail-biter*), none of these are complex event nominals. The only *-er*-nouns I found which admit of complex event nominal uses are *merger*, [%]*ouster* and *waiver* (*their waiver of the restrictions*, *their ouster of the president*).

³ The only constraint on *-ing*-nominalizations is blocking by well-established synonymous nominalizations, as reflected in judgments like (i) (cf. Harley & Noyer 1998). Such behaviour is normal with fully productive affixes, witness the well-known blocking of *-er*-nominals like *cooker*, *stealer*, *server* in meanings equivalent to the existing forms *cook*, *thief*, *servant*. A caveat here is that *-ing*-forms like those in (i) are web-attested and fairly acceptable to me. It might be that acceptable *-ing*-forms differ subtly in meaning from their rivals (to my ear *admiring* has an eventive reading lacking in *admiration*). However one explains such cases, it is noteworthy that even stronger blocking effects like that in (ii) are overridden in the presence of particles, cf. (iii).

(i) *her {admiration/*admiring} of Mary; the {destruction/*destroying} of cities*
(ii) *the {trial/*trying} of the products*
(iii) *the {trying/*trial} out of the products*

There are doubts about the synchronic productivity of most other fussy affixes in (14)-(18). This holds of *-ance*, *-ure* and *-ment* according to Bauer (2001: 177-181). One can certainly find many tokens of derivations with *-ment*, but new tokens since the mid-nineteenth century are scarce. By contrast, *-(at)ion* is productive, but note with Bauer (2001: 183) that nearly all new formations have affixed bases, mainly with *-ize* and *-ify* (*Obamarization*, *Bushification*), and other formations are apt to be jocular (*chatteration*). Our expectation that *-(at)ion* should attach to particle verbs diminishes further when we note that Germanic particles are at loggerheads with its preference for Romance input (Marchand 1969: 259-261).

(22) exemplifies constraints on the use of the fussy affixes in (14)-(18). Attributing the unacceptability in current English of the formerly possible *-ment*-formations in (22)f) to blocking is unconvincing, since the only competing nominalizer is *-ing*, which is an Elsewhere affix which is itself blocked by other affixes (recall footnote 3), and since *-ing*-forms like those in *their {garnishing/flustering/reviling} of them* do not evince the familiarity effects one would expect of memorized derivations capable of blocking others.

- (22) a. the {trial/denial/*supplial/%decrial} of them
 b. the {clearance/appearance/*steerance} of them
 c. the {leakage/seepage/%drippage/*flowage/*escapage} of water into it
 d. the {closure/exposure/*imposure} of them
 e. their {division/decision/derision} of them / his {confiding/*confision} of the matter to a doctor
 f. †astoundment, †garnishment, †dispiritment, †flusterment, †revilement, †concernment, †bailment, †securement (Marchand 1969: 331f)

4.3. Why particle incorporation is obligatory in complex event nominals

My appeal to obligatory particle incorporation in complex nominals would gain plausibility if I can name plausible factors which force it. My attempt in this direction begins with the observation that *of*-insertion arguments must be arguments of the nominalized verb, witness the well-known observation (e.g. Chomsky 1970, Sichel 2010) that *of*-insertion is excluded with ECM objects, cf. (23)a). Similarly, complex event nominalizations of unselected object resultatives like (23)b) are adjudged unacceptable by Carrier & Randall (1992) (in contrast to cases like (23)c) involving objects selected by V). A complication is that some speakers, myself included, accept (23)b). I surmise that in such cases the more liberal idiolects allow the verb and result predicate to reanalyse as a complex predicate which takes the Theme⁴ as its argument, which then means that the Theme counts as an argument of V and can be linked by *of*-insertion.

- (23) a. *the considering/consideration of John (to be) honest.
 b. (*)the running of pavements thin, (*)the working of one's fingers to the bone
 c. the hammering of metal flat, the pushing of the car into the garage
 d. their outplaying of the home team; the river's overflowing of its banks
 e. the voting {out} of the government {*out}; the working {off} of the debts {*off}

The complex predicate formation just described involves abstract incorporation (e.g. Baker 1988) in that it has no morphological or phonological reflexes, witness the separation of the derived nominal from the result predicate by the *of*-marked Theme in (23)c). English does not allow the morphological incorporation of APs and full PPs. By contrast, it does allow the morphological incorporation of complementless prepositions, whether they surface as prefixes, as in (23)d), or as particles, as in (23)e). If my reasoning is correct, the complex predicate formation mechanism just described must be at work in (23)d,e), since these examples involve

⁴ I use *Theme* as shorthand for whatever thematic role an argument corresponding to a transitive object or an unaccusative subject has (be it Patient, Theme of Motion, Incremental Theme, etc.), without wishing to imply that *Theme* in this sense is a grammatical primitive.

unselected objects. To explain the constraint on particle placement in (e), we need only assume that the incorporation spoken of must be realized morphologically *if possible*.

A remaining question is why *of*-insertion should be illegitimate with arguments which are not thematic arguments of the nominalized V. My answer begins by noting that most devices for argument realization stipulate particular thematic interpretations for the arguments they introduce. We see this with various prepositions: *to* can assign a Recipient role (*give it to them*), *with* can link Theme of Motion arguments (*The garden crawled with spiders; Off with his head!*) and *of* has a use in linking removed objects (*rob/deprive/clear/empty X of Y*). Similarly functional heads like Voice and Appl(icative) proposed in the literature assign roles like Agent or Recipient/Beneficiary to their specifiers (e.g. Pytkänen 2002). By contrast, *of*-insertion does not stipulate particular thematic interpretations for the arguments it links, beyond insisting that the argument be an *argument of the nominalized verb*.

This account briefly laid out here is still in its infancy, but it appears to be promising as a potential explanation for a number of different facts, and makes the obligatoriness of particle incorporation understandable.

4.4. Dismissal of an alternative account: Sichel (2010)

Sichel (2010) proposed an interesting alternative explanation for data like (14)-(18) which makes no appeal to incorporation of particles and would thus nullify my argument if it were correct. Sichel suggests that the only English nominalizer capable of supporting an event structure with multiple subevents is *-ing*. The other affixes in (14)-(18) are accordingly incompatible with resultative particles, since a resultative interpretation entails multiple subevents. An immediate problem for this account is that ruling out e.g. **the enticement in of people* wrongly excludes *the enticement of people into the building*, and analogous problems affect all data in (14)-(18).

One could try to uphold Sichel's account by adding the following assumptions to it:

- (24) a. Certain PPs that look like result predicates are actually adjuncts.
- b. The full PPs in (14)-(18) are adjunct PPs of the type in (a).
- c. Particles cannot be merged as adjunct PPs of the type proposed in (a).
- d. Adjunct PPs do not create complex event structures which are illicit in event nominals with affixes other than *-ing* on Sichel's account.

The claim in (24)a) is seldom discussed, but may be right, as I argued myself (2004). It is for instance supported by (25)a), in which *re-* triggers the presupposition that the settlement had been divided in some way before, but not necessarily that it had been divided into six districts. Since the PP is outside the scope of *re-*prefixation, it is presumably merged higher in the structure than the object, in an adjunct-like position. One could extend this analysis to *the (re)division of the country into two*, as per (24)b).

- (25) a. The redivided a settlement it into six administrative districts.
- b. Bob kicked Bill in the head, so Bill kicked Bob in the head back.
- c. We had dinner at the table in *(the house).

I also concede that (24)c) is reasonable. Few particles share the ability of *back* in (25)b) to appear in a clearly adjunct-like position outside other PPs. Even the particle in *we had dinner in* cannot replicate this behavior, cf. (25)c), although it has a locational modifier interpretation which one normally associates with adjuncts.

However, Sichel's account cannot be salvaged using (24). The claim in (24)b) makes no sense of (15), since we are dealing with an unselected object resultative construction: the object in *they merged company A into company B* does not entail *they merged company A*. If the *into*-PP in (15)c) were an adjunct, one would have to allow it to merge with a semantically and argument-structurally ill-formed *merger of it*. Similar remarks apply to (18)b): in PP in *the clearing of goods out of the factory* is hardly an adjunct given that *they cleared the goods* has the irrelevant

interpretation ‘affirm that the goods conform to regulations’ but not the relevant motion verb interpretation.

5. Synthetic compounding in particle verb nominalizations

5.1. Introduction to the data

My next argument in favour of [_V° V P] will involve structures like (26) in which the Theme of a nominalized particle verb is incorporated to form an apparently previously unstudied kind of synthetic compound. The examples in (26) are all internet-attested and could easily be multiplied.

- (26) a. *trash taker outer* [cf. *the taker-outer of the trash*]
b. *house-fixer-upper, house-puller-downer, head-kicker-inner, form-filler-inner, stain-getter-outer, shoe-taker-offer, sock-putter-onner*
c. *water soaker-upper, title thinker-upper*

Now consider the paradigm in (27). Comparison of (a) and (b) suggests that full PP complements are compatible with Themes realized as full phrases, but not with incorporated Themes. Theme incorporation is only possible if the Goal is realized as a particle, as in (27)c). (28) furnishes more examples of failed attempts at incorporating nominals with a full phrasal complement present.

- (27) a. I am an inveterate and incurable taker of people into my house.
b. *an inveterate people-taker into my house
c. an inveterate people-taker-inner
- (28) a. *a car pusher into the garage; *the ball thrower off the boat; *a bus driver south
b. *a door breaker open; *the partner shooter-dead; *the prisoner beater to death

A complication is the fact that structures with *to*-datives like (29) are attested and perfectly acceptable to at least some speakers. These differ from the PPs in (27)a,b) and (28) in that the latter are *complement* PPs, while Bruening (2010) shows convincingly that there is a kind of dative *to*-PP which merges higher than Theme arguments and is thus not a complement. (Presumably speakers who reject (29) cannot use the high-merging type of dative PP in nominalizations, for reasons which are unclear to me, but not crucial here.)

- (29) a gift-giver to children

A final empirical point to note is that it is sometimes possible to improve structures of the type in (28) by incorporating the PP, cf. (30). (30)b) is degraded due to the very marginal status of incorporation of full PPs in English synthetic compounds, but is not as bad as (30)a), where the PP is not incorporated.

- (30) a. *a bricklayer drinker under the table
b. ??a bricklayer under-the-table-drinker [Cappelle 2010]

The conclusions from the data seen thus far can be stated as follows.

- (31) a. Theme arguments cannot incorporate in the presence of a full PP complement, cf. (27)c) and (28).
b. Incorporation of the PP makes Theme incorporation better, cf. (30).
c. Theme arguments can be incorporated in the presence of particles in structures of the type *trash-taker-outer* in (26), (27)b).

If particle verbs are complex heads in cases like *trash-taker-outer*, we can collapse the collection of statements in (31) into a single generalization:

- (32) CONDITION ON THEME INCORPORATION (CTI): In a nominalization in which a Theme and (an argument corresponding to) a syntactic complement are realized, the Theme cannot incorporate unless the other argument incorporates first.

5.2. Deriving the data

We now show that the descriptive statement in (32) can be integrated into an explanatory system, irrespective of whether one adopts lexicalist or non-lexicalist assumptions.

One can easily integrate the CTI into a lexicalist approach which assumes that only the least prominent (non-subject⁵) argument may incorporate in a synthetic compound. If the Theme is the only argument, it is the lowest argument, and thus incorporable: *car pusher*. Structures like **car pusher into the garage* are excluded since in a lexicalist system compounding is presyntactic, with the consequence that the PP complement is merged higher in the structure than the Theme (possible structures are given in (33)a,b)⁶, which violates the standard pattern according to which Theme arguments are linked in higher, more prominent positions than directional PPs.

- (33) a. *[NP [N° *car* [N° *push-er*]] [PP *into the garage*]]
 b. *[NP [N° [V° *car-push*]-er] [PP *into the garage*]]
 c. [N° *car* [N° [V° *push-in*]-er]]
 d. [N° [V° *car* [V° *push-in*]]-er]
 e. *cart-overturning, problem-overlooker, tree-uprooter, law-upholder*

Capturing *car-pusher-inner* in the system just described is unproblematic if one assumes that the particle and verb form a complex verb [V° V P]. Possible structures are given in (33)c,d). In both cases the particle is more deeply embedded than the Theme, as it should be. The structures are configurationally equivalent to those that would be needed for data like (33)e), except that these involve right-headed complex verbs rather than particle verbs. Regarding affix reduplication, recall from section 3 the claim that the inner affix is not structurally relevant and is inserted for morpho-phonological reasons.

Structures like (33)c,d) could be seen as a type of recursive synthetic compounding. Data like (34) have been taken to show that synthetic compounding cannot be recursive (Selkirk 1982:37, Lieber 2004:58). However, these data do not show what they are supposed to, since **shelf-putting* and **child giving* are bad on the relevant readings. Apart from isolated cases like *churchgoer*, synthetic compounds with nominals corresponding to syntactic PPs and dative *to* are scarcely productive: **home address sending (of books)*, **museum donation (of art)*. Expecting (34)b) to be grammatical because of the existence of *give a child a gift* misses the fact that double object constructions are not found in derived nominalizations that realize the arguments phrasally (**giver (of) a child (of) a book*). While there are certain types of synthetic compounding that are subject to genuine constraints on recursion, such as *-ing* adjectives (**linguist-sick-making* vs. *sickmaking, peacemaking*), I submit that a ban on recursive synthetic

⁵ Agents do not incorporate in synthetic compounds, cf. **girl {discussion/writing/reading/analysis/collection} (of poetry)*. To my knowledge no apparent counterexample involves genuine synthetic compounding. For instance, in (i) below *Liszt* is not an incorporated Agent but a modifier (perhaps a zero-derived relational adjective) merged above the PP complement, witness the ability of *one* to replace the underlined string in (ii). Furthermore, *Liszt transcriptions* is not initially stressed, unlike genuine synthetic compounds like *symphony transcriptions* in (iii). Analogous arguments also apply to cases like *city employee* discussed in Bobaljik (2002).

- (i) the Liszt transcriptions of the Beethoven symphonies.
 (ii) the Liszt transcriptions of the symphonies sound better than your ones.
 (iii) (Liszt) *symphony transcriptions*
 (iv) **symphony Liszt transcriptions*

⁶ Fortunately we can sidestep the issue of whether synthetic compounds have the structure [N [V N V]-er] or [N N [N V-er]]. Dismissing the former structure because there is no verb **car-push* is a common but, I believe, overrated argument. There are plenty of attestations of synthetic compounds corresponding to verb-object idioms: *hackle-raiser* (McIntyre, in prep.). Here it will not do to say that the non-head is related to *raiser* by pragmatic inferences, since such compounds are possible even for speakers for whom *hackle* is a cranberry word not usable outside the idiom chunk. Similar cases can be found with V-Particle-Object idioms:

- (i) *towel thrower-inner* [who *throws in the towel* 'gives up']
 (ii) *steam letter-offer* [that lets one to *let off steam* 'relax']
 (iii) *tab picker-upper; rear bringer upper; new-leaf-turner-over; last word getter inner; support drummer upper*

compound nouns is poorly motivated, and would probably not have been proposed had researchers been aware of data like (33)e) and cases like *car-pusher-in-er*.

- (34) a. *shelf book putting/*book shelf putting; *shelf book putter/*book shelf putter
b. *child gift giving/*gift child giving; *child gift giver/*gift child giver

We now see how the CTI in (32) could be policed in syntactic frameworks using head movement à la Baker (1988). Harley (2008) applies this to English synthetic compounds. She updates the First Sister Principle (Roeper & Siegel 1978: 208) by assuming that complements may incorporate into the heads selecting them, but specifiers may not. This approach makes correct predictions regarding our data. A standard compound like *car pusher* would be generated from the configuration in (35)a). *car* incorporates into *push* and *car-push* incorporates into the nominalizer. (To improve legibility, (35) does not depict the head movement.) The approach excludes **car pusher into the garage* because the presence of a PP complement automatically means that the Theme must be in a specifier (be it of a Small Clause or equivalent constituent, as in (35)b), or of a verbal projection, as in (35)c)), and thus cannot incorporate.

- (35) a. [_{NP} -er [_{VP} *push* [_{N°} *car*]]]
b. *[_{NP} -er [_{VP} *push* [_{SC} [_{N°} *car*] [_{PP} *into the garage*]]]]]
c. *[_{NP} -er [_{VP} [_{N°} *car*] [_{V'} *push* [_{PP} *into the garage*]]]]]
d. [_{NP} -er [_{VP} [_{V°} *push in*] [_{N°} *car*]]]

If we assume that particle verbs can merge as complex heads, as in (35)d), then *car* can be merged as complement to such a head, and would thus be able to incorporate in Harley's system, so the system would be able to derive *car-pusher-in-er* (again under the proviso that the inner affix is inserted for morpho-phonological reasons and is thus structurally irrelevant).

One might see (35)d) as inconsistent since *push in* is base-generated as a complex head while nominal compounds are generated by Baker-style head movement. A perhaps preferable assumption is that Theme incorporation involves not head movement, but a much simpler process of *merger of two heads in a sister configuration*, as in either of the configurations in (36)a). (36)a) is empirically superior a head movement approach to the same data, since head movement predicts complement stranding, which is ill-formed in the cases at hand, cf. (36)b).

- (36) a. [_{NP} -er [_V [_N *car*] [_V *push*]]] / [_N [_V [_N *car*] [_V *push*]]-er]
b. **son promotion* [_{NP} *t_{son} of a friend*] 'promotion of the son of a friend'
c. [_{NP} -er [_V [_{N°} *car*] [_{V°} *push in*]]] / [_N [_V [_N *car*] [_V *push in*]]-er]

If Theme incorporation involves direct merge rather than head movement, either structure in (36)c) would work for cases like *car pusher-in-er*; configurationally parallel structures would be usable for *law upholder* and others in (33)e). To exclude **car-pusher into the garage*, we either assume that full PPs always occupy a Small Clause configuration like (35)b), in which case the Theme would not be in a direct sisterhood relation with V, or assume the structure in (35)c) and that the constituent labelled V' cannot reanalyse as a V°, in which case *car* would not be sister to a head and thus unable to form a compound with it.

5.3. Appendix: Parallel German data

I now briefly present German data which confirms assumptions made in sections 5.1 and 5.2. German freely generates particle verb nominalizations with incorporated Themes like (37) (where the particles are in capitals). These are analogous to English *car-pusher-inner* and similar data in (26), except that German particle verbs are head-final and do not force speakers into suboptimal solutions to the problem of suffixing left-headed structures.

- (37) a. *BäumeABSägen* 'trees.down.sawing'; *KerzenAUSblasen* 'candle.out.blowing';
MüllWEGbringen 'rubbish.away.taking'; *ReifenAUFpumpen* 'tyre.up.pumping'

- In (38) we see that the CTI in (32) is valid for German. The Theme can incorporate if the particle incorporates first, cf. (32)a), but not if there is an unincorporated directional complement, cf. (32)b), which is the analogue of cases like *car-pushing into the garage* and similar cases in (28). (32)c) illustrates that this problem can be avoided by incorporating the full PP, but this kind of phrasal compounding is marginal like its English counterpart in (30)b). Finally, (32)d) illustrates that unincorporated full PPs are possible if the Theme is itself not incorporated.

- 12

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