

Event structure and argument realization in English zero-derived nominals with particles

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Abstract

This paper is concerned with the morphosyntax of zero-derived nominals based on verbs with postposed and prefixed particles (e.g. *to bail out* > *the bailout-∅*; *to override* > *the override-∅*). In general, zero-derived nominals have received less attention than suffix-based nominals (cf. *the climb-ing*, *the examin-ation*, *the assign-ment*). In the generative literature, in particular, after Grimshaw's (1990) insights on the ability of suffix-based nominals to inherit verbal event and argument structure, zero-derived nouns have been claimed to lack such properties and have been syntactically analyzed as derived not from a verb but from an uncategorized root, as modeled in Borer (2013). Drawing on data from natural text corpora and following Rappaport-Hovav and Levin's (1998) theory of event structure and argument realization, I show that zero-derived nouns derived from verbs with postposed and prefixed particles may realize argument structure on their event readings, which can only come about from the event structure of their base verbs.

Keywords: *zero-derived nominals, particle verbs, morphosyntax, argument structure, lexical semantics*

1. Zero-derived nominals and their previous syntactic modeling

The focus of this paper is zero-derived nominals (ZNs), as in (1b), which will occasionally be presented in comparison to suffix-based nominals (Suff-Ns), as in (1c), both types being morphologically related to verbs as in (1a).¹ The main difference between the two is the nature of the nominalizing suffix, which is covert in ZNs and overt in Suff-Ns. In particular, I will closely address what I call P-ZNs, i.e. ZNs derived from verbs with particles, either postposed, as in (2a), or prefixed, as in (2b).

- (1) a. to climb; to divide
b. the climb-∅; the divide-∅ (ZNs)
c. the climb-**ing**; the divis-**ion** (Suff-Ns)
- (2) a. to bail **out** > the **bailout**-∅
b. to **override** > the **override**-∅

Both ZNs and Suff-Ns as in (1b)-(1c) resemble Chomsky's (1970) category of derived nominals and substantially differ from (verbal) gerunds as in (3b) in their fully nominal behavior: see their compatibility with adjectives instead of adverbs and the *of*-genitive marking on internal arguments in (3c)-(3d):

- (3) a. John {slowly/*slow} climbed the ladder.
b. John's {slowly/*slow} climbing the ladder.
c. John's {slow/*slowly} climbing of the ladder.
d. John's {slow/*slowly} climb of the ladder.

¹For zero-marked N-V pairs, it is controversial whether one is derived from the other or both are independently formed. Given that the cases of ZNs I discuss here are related to verbs with particles, which normally do not attach to lexical nouns, we may traditionally characterize them as 'deverbal' (see Cetnarowska 1993:§1.3). In §3, however, I will argue that their morphosyntactic properties support the structural derivation of some ZNs from their base verb, while others must be derived from a root, like lexical nouns.



1.1. *Argument structure nominals and referential nominals*

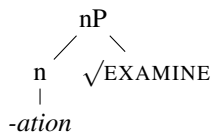
Grimshaw (1990) identifies uses of derived nominals whose interpretation and morphosyntax are compositionally derived from the base verb’s event structure, while others are closer to lexical nouns, in that their connection to the verb weakens to several degrees up to lexicalization. I will refer to the former as Argument Structure Nominals (ArgStr-Ns), since they inherit argument structure from their verbs (Borer 2013). In (4a), *examination* realizes an ArgStr-N reading: it has an eventive interpretation attested by the predicate of events *took a long time* and realizes the external and internal arguments of the base verb. In (4b), *examination* instantiates what Grimshaw calls a Result Nominal reading. On this reading, it is synonymous with *exam*, compatible with a predicate of individuals like *is on the table* and disallows the internal argument. The original external argument *the instructor’s* is interpreted as a possessive modifier. (4c) illustrates a further referential reading labeled Simple Event Nominal by Grimshaw, on which, in the absence of the internal argument, *examination* is compatible with the same predicate of events as in (4a). Yet, its incompatibility with the agentive adjective *intentional* (vs. the ArgStr-N in (4a)) shows that *the instructor’s* cannot be an external argument on this reading and is similar to the possessor in (4b).

- (4) a. The instructor’s (intentional) **examination of the papers** *took a long time.* (ArgStr-N)
- b. The instructor’s **examination/exam** (*of the papers) *is on the table.* (Result Nominal)
- c. The instructor’s (*intentional) **examination** *took a long time.* (Simple Event Nominal)

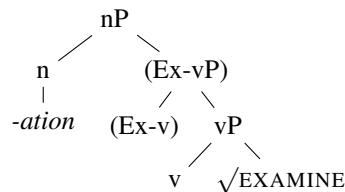
Grimshaw (1990:67) argues that ArgStr-Ns introduce an event argument like verbs, while Result and Simple Event Nominals introduce referential arguments like lexical nouns. For this reason, I refer to the latter two under the joint term Referential Nominals (Ref-Ns) as in Borer (2013). Grimshaw discusses several morphosyntactic tests to tell the difference between ArgStr-Ns and Ref-Ns, which have been refined in later literature (see summary in Borer 2013:Ch. 2; cf. Lieber 2016 for criticism). In this paper, I take the realization of at least the internal argument in an eventive context to represent ArgStr-Ns, much in the spirit of Grimshaw (1990), Alexiadou (2001), and Borer (2013). Further clarifications are offered in §2.

Grimshaw’s dichotomy was successfully implemented in syntactic theories of word formation like Distributed Morphology (DM) (Marantz 1997, Harley and Noyer 2000, Alexiadou 2001) and the Exo-Skeletal Model (XSM) (Borer 2013). Recent developments of DM assume two levels of word formation, which naturally capture the distinction between Ref-Ns and ArgStr-Ns. If we take the root $\sqrt{\text{EXAMINE}}$, the nominal categorizing suffix *-ation* may attach either directly to it in a root-based/inner-cycle derivation pattern, as in (5), or to a level above the first-categorizing node in a word-based/outer-cycle derivation, as in (6) (see Arad 2005, Embick 2010, Marantz 2013).

(5) Root-based/inner-cycle derivation



(6) Word-based/outer-cycle derivation



While in (5) *n* simply attributes the noun category to the root, in (6) *n* changes the category of an already categorized word (the *vP* or some extended projection of it) into a noun. Building on previous work, Marantz (2013) argues for a crucial distinction between the two levels of attachment to the extent that (inner-cycle) categorization represents a local phase domain with clear predictions about the behavior of the two types of formations. On the one hand, root-attachment predicts: 1) negotiation of idiosyncratic meanings of the root in the context of the first categorizing node, leading to polysemy; 2) limited productivity accompanied

by phonological changes and selectional restrictions in the combination of the derivational suffix with the root; 3) impossibility of argument realization, since arguments come from extended functional structure, which is not available in (5); 4) phonological changes on the root are possible (allomorphy). On the other hand, word-level attachment predicts: 1) compositional meaning derived from the functional structure of the base word; 2) apparent productivity; 3) realization of argument structure to the extent that the appropriate functional structure is available; 4) no phonological changes on the root are possible. If we take *n* to be the suffix *-ion* in (5) and (6), we derive the Ref-N uses in (4b-c) as root-based formations displaying polysemy² and the ArgStr-N use in (4a) as a word-based formation, where Ex-vP stands for extended projections like ThemeP/VoiceP that introduce internal/external arguments; see §3.

1.2. Zero-derived nominals in Borer (2013)

Grimshaw (1990:67) assumes ZNs to be Ref-Ns, without addressing their properties. Borer (2013:Ch. 7) investigates them more closely and reaches the same conclusion. She offers an XSM-account as in (7) for *walk*, which is comparable with the root-based derivation in (5), excluding the categorizer *n* – in XSM, roots are indirectly categorized in the categorial space of extended functional projections like D for nouns:

(7) [D [_{C=N} √WALK]]

Borer discusses several aspects of the morphosyntax of ZNs that lead to this account, with a focus on reasons to reject the hypothesis of a zero derivational suffix in a non-separationist theory of word formation which maintains the form-meaning isomorphism. I focus on two of her arguments for a direct comparison with the DM structures in (5)-(6), admitting that there are foundational differences between the two theories that I cannot address here.³ First, Borer (2013:332) argues that ZNs cannot realize argument structure: in (8), it is the corresponding Suff-N that is compatible with the internal arguments *of the dog*, *of the officers*, the external argument *by the subordinates*, and the aspectual adverbial *for three hours*; the ZN is not.

- (8) a. the {**walking**/***walk**} *of the dog for three hours*
 b. the {**salutation**/**saluting**/***salute**} *of the officers by the subordinates*

Second, Borer highlights that ZNs often involve stress shift from verbal final stress to nominal initial stress (cf. Marchand 1969:378, Kiparsky 1982), as in (9). From the perspective of the two derivational patterns in (5)-(6), the absence of argument structure in (8) and the phonological changes on the base in (9) indicate that ZNs must be root-derivations as in (5)/(7).

- (9) a. to tormént > the tórmènt b. to permít > the pérmít

Furthermore, Borer (2013:331) mentions some ZNs which ‘exceptionally’ realize argument structure (e.g. *(ex)change*, *release*, *(mis)use*, *abuse*, *murder*, *discharge*, *endeavor*, *consent*, *resolve*, *descent*, *ascend*; see also Harley 2009, Lieber 2016). Yet, she argues that the bisyllabic ones do not show stress shift, which must be due to some suffix that is phonologically robust enough to block stress shift. In Borer’s view, these ZNs represent ArgStr-Ns (see *release* in (10)) and conform to a structure parallel to (6).

²Challenging cases of overt verbalizing morphology such as *-ize* in the result nominal readings of *nominalization*, *organization* have been pointed out in Harley (2009), Borer (2013:447), and some solutions are mentioned in Marantz (2013).

³In the DM literature, Alexiadou and Grimshaw (2008) and Harley (2009) do not go to great lengths to analyze the behavior of ZNs. Alexiadou and Grimshaw (2008) propose zero as a possible spellout of *n* just like overt suffixes, much in the DM spirit of lexical categorizers that I also embrace, while Harley (2009) suggests that ArgStr-N uses of ZNs are mass nouns, which is not confirmed by my data: cf. fn. 9.

(10) the {release/*rélease} of prisoners

The two ZNs I started with in (1b) show a contradictory picture: on the one hand, *divide* receives the Ref-N reading ‘boundary’ and is incompatible with ArgStr-N contexts that the SN *division* allows (e.g. *the division/*divide of the town by the political parties*), much like in Borer’s (8). On the other hand, *climb* easily realizes ArgStr-N readings, as in (3d), pointing to a word-based derivation. In what follows I investigate what I call P-ZNs, i.e. ZNs derived from verbs that involve a postposed or prefixed particle (cf. *bailout*; *override*), which have not been addressed in Borer (2013). I will show that these often realize argument structure, although they usually also involve stress shift (Bolinger 1961, Berg 1998, Hurrell 2001:287-288). This behavior challenges both Borer’s reasoning and the DM distinction in (5)-(6), in that they combine a property typical of word-based derivations (i.e. argument realization) with one of root-based derivations (i.e. stress shift). My empirical contribution draws on data from natural text corpora, which allow me to illustrate the great variety of P-ZNs that show the potential to realize ArgStr-Ns. In §2 I present my corpus-based methodology and the empirical picture that I rely on. §3 lays out my syntactic analysis of P-ZNs, especially on their ArgStr-N uses, and in §4 I present my conclusions.

This paper makes two contributions to the study of zero-derived nominals with important implications for theories of word formation. First, I offer an insight into the puzzle of ‘exceptional’ ArgStr-ZNs by investigating how this behavior may be traced back to the lexical semantics of their base verbs and the ontology of the root. I will argue that ArgStr-ZNs that involve particles include two roots, each of which lexicalizes a different structural subevent with its corresponding argument (Rappaport-Hovav and Levin 1998). Second, the challenge of zero derivational morphology leads theoretical thinking to positing a clear distinction between zero and overtly marked formations: i.e. between ZNs and Suff-Ns. By showing that, depending on the base verb, some ZNs may realize both ArgStr-N and Ref-N readings, my study supports a DM separationist view of word formation (contra Borer 2013), in which the covert or overt spellout of a suffix does not bear on the morphosyntactic and semantic complexity of the derivation.

2. The challenge of ZNs with particles

In this section I describe how P-ZNs challenge Borer’s generalizations and the two patterns of word formation in (5)-(6). I start by briefly introducing the theory of argument structure in Rappaport-Hovav and Levin (1998) and subsequent work, which I build on in my account, and then explain why verbs with particles and their ZNs are interesting from this perspective. In the second part, I focus on the ability of P-ZNs to realize ArgStr-N readings and explain their limited productivity by means of the competition with *ing*-Suff-Ns.

Most contexts used for illustration below come from natural text corpora available at <http://www.english-corpora.org> – namely, Corpus of Contemporary American English (COCA), Corpus of Global Web-Based English (GloWbE) and News on the Web (NOW) (Davies 2008-; 2013a;b); some examples are from the Oxford English Dictionary (OED) or from the web, and a few others come from introspection and previous literature. The web corpus data are collected from US, British (GB), Canadian (CA), and occasionally Irish (IE) and Australian (AU) web domains, as indicated when necessary.

My main goal in this paper is to show that there are sufficient P-ZNs to challenge the previous observations and that they deserve a close scrutiny instead of being treated as ignorable exceptions. For this reason, I opt for the illustration of several different ZNs in contexts from natural text corpora instead of an in-depth analysis of just a few data points, which could again be argued to be exceptional. As I indicate in my data discussion in §2.2 and §2.3, to illustrate ArgStr-N uses, I chose contexts with ZNs that realize at least the internal argument of eventive readings parallel to their base verbs. Sometimes both arguments are realized and other times additional eventive modifiers accompany them, enforcing the event reading.

2.1. *Manner, result, and manner+result verbs*

Rappaport-Hovav and Levin (1998) proposed a binary distinction among verbs based on the ontology of their roots, which they further developed into what has come to be known as the Manner/Result Complementarity hypothesis in verb meaning (Beavers and Koontz-Garboden 2020). They follow an event structure approach to verb meaning, in which the *template* or *event structure* is responsible for regularities that lead to systematic verb classes, while the *root* represents the idiosyncratic meaning that distinguishes between verbs within the same class. The core of their proposal is that verbal roots may be classified into two large classes – manner and result – which present restrictions on the kind of template they will combine with: some verbs are built on roots that modify the event by specifying the manner in which the event evolves, while others involve roots that act as arguments of change of state events and specify result states. A few examples for the two kinds are given in (11).

- (11) a. Manner verbs: run, jog, yell, walk, play, wipe, sweep, scrub etc.
 b. Result verbs: break, clean, destroy, dim, shatter etc.

While unergative verbs all involve manner roots, transitivity does not entail result: namely, verbs like *wipe*, *sweep*, *scrub* differ from transitive result verbs like *clean*, in that they do not lexicalize a result state. Their compatibility with an adjective that denies an expected result state such as *dirty* in (12) shows that only *clean* is a result verb and encodes a result state, while the others solely specify manners of events.

- (12) I {*wiped/scrubbed/#cleaned*} the tub, but it is still dirty.

For the two types of verbs, Rappaport-Hovav and Levin (1998) offer the two event structures in (13). For manner verbs in (13a), the root modifies the single ACT event, which requires only one argument *x*; for result verbs in (13b), the root appears in the complement position of the BECOME predicate, specifying the result state of the ACT subevent, in which a second argument *y* finds itself. Importantly, the Argument Realization Condition (Rappaport-Hovav and Levin 1998:113) requires a syntactic argument for each of the event structure participants in these templates, and each syntactic argument must correspond to such a participant. The implication is that manner verb templates only require a structural external argument, while result verb templates require both an external and an internal argument. For transitive manner verbs, the internal argument is argued to come from the root and not from event structure, so it is not obligatory in the syntax: see *Phil swept (the floor)* vs. *Kelly broke *(the vase)*.

- (13) a. Manner verbs: e.g. run [*x* ACT_{<RUN>}]
 b. Result verbs: e.g. break [[*x* ACT] CAUSE [BECOME [*y* <BROKEN>]]]

Levin and Rappaport Hovav assume the two types of root to be complementary: i.e. a given root can either name an action/manner or a (result) state, but not both. This follows from the fact that a verb's event structure can only have one root (cf. Levin and Rappaport Hovav 2013 on some challenging cases of verbs that lexicalize both manner and result in different contexts). However, recent work summarized in Beavers and Koontz-Garboden (2020) specifically argues against the Manner/Result Complementarity, by showing for some particular verbs that their roots encode both manner and result. Without going into the details of the debate, this observation is important for my purposes, since, to the extent that the verbs that Beavers and Koontz-Garboden take to be built on manner+result roots form ZNs, these seem to realize argument structure. For instance, *climb* is argued to be a manner+result verb in Beavers and Koontz-Garboden (2017), and we saw in (3d) that it forms ArgStr-ZNs, many of which can be found in corpora. In addition, we find ArgStr-ZNs such as *toss*, *throw*, *roast*, whose verbs are also argued to be manner+result in Beavers and Koontz-Garboden (2020:Ch. 4):

- (14) a. His frustration was made clear by *a **furious** toss of said wheel to the ground.* (NOW: GB)
 b. *a **quick** throw of a syringe* shows he may be broken, but ... (GloWbE: GB)
 c. The sun, unclouded, resumed *its **slow** roast of the forest canopy.* (COCA)

2.2. P-verbs and their zero-derived nominals

P-verbs as in (2), repeated here in (15), are interesting for the manner-result distinction, since they involve two roots: the verb and the particle. Although in their work on verb meaning, the authors above limit their attention to morphologically simple verbs, a traditional and widely accepted view is that the particles of P-verbs contribute a resultative component similar to a small clause (Dikken 1995, Svenonius 1996, Ramchand and Svenonius 2002, Roßdeutscher 2013, van Gelderen 2018; for the semantics of different particles see Cappelle 2005, McIntyre 2007, Larsen 2014:Ch. 3).

The literature on P-verbs focuses on verbs with postposed particles, which are syntactically more interesting due to their analytic form. Svenonius (1996) notes that in Scandinavian languages, like in English, P-verbs with prefixed particles are more idiomatic: cf. *to uplift – to lift up*. This difference, however, does not change the generalization that they both involve resultative particles, as Larsen (2014:Ch. 3) also argues. From the perspective of the manner-result distinction, this means that the verb roots *baile* and *ride* in (15) introduce manner, and the particles *out* and *over* introduce result states, as in (13b).

- (15) a. They *bailed out* the banks./They *bailed* the banks *out*.
 b. The counsel *overrode* the veto.

If these verbs involve two subevents with their structural arguments, the expectation is that, to the extent that their ZNs receive parallel event readings, they should syntactically realize these arguments. This is the case for *bailout* and *override* in (16), which are parallel to the verbal constructions in (15):

- (16) a. their *bailout* of the banks
 b. the counsel's *override* of the veto

I focus on P-verbs and P-ZNs with parallel morphological structures: that is, i) with postposed particles, as in (15a), (16a), and ii) with prefixed particles, as in (15b) and (16b). I will not address pairs in which the verb's postposed particle is promoted to a prefix in the noun such as *to break out* vs. *the outbreak*, *to lay out* vs. *the outlay of money*, but see Berg (1998), Roeper (1999) for some discussion and Wood (To appear) on comparable cases with prepositions in Icelandic.⁴ Moreover, I keep the N-V pairs with prefixed particles separate from those with Latin prefixes such as *de-*, *re-* (see *declutter*, *rewrite*), although I assume that the latter's analysis would be quite similar to the one I offer for the former.

Roeper (1999) argues for a syntactic difference between nominalizations with postposed and prefixed particles, by which he claims that only the latter realize argument structure: see his contrasting examples with the particle *out* in (17)-(18), although he also notes the counterexamples in (19a) vs. (17), and (19b-d)/(16a) vs. (19). Roeper's goal is to support the anti-symmetry thesis in derivational morphology by positing leftward movement of verbal particles to a prefixed Spec-position which c-commands the internal argument, allowing its realization in (17). Postposed particles do not respect anti-symmetry, as they do not move to the left, and Roeper analyzes them under rebracketing, as compound formation. From their position, postposed particles do not c-command arguments and block their realization, in Roeper's view.

⁴A reviewer notes that such ZNs may be losing ground to the ones faithful to the verbal structure: cf. *the breakout of the war* (OED). It would be worth investigating whether we find any meaning differentiation in this competition, although *outbreak* and *breakout* appear to be close synonyms.

- | | | |
|---------------------------------|------------------------------------|-------------------------------------|
| (17) a. outflow of funds | (18) a. * burnout of people | (19) a. *the outfit of Bill |
| b. output of energy | b. * dropout of school | b. the buy out of CBS |
| c. outbreak of cholera | c. * blow-out of tires | c. the bail out of S&L's |
| d. outburst of invective | d. * work-out of muscles | d. the black out of the city |
| e. outlay of money | e. * fadeout of interest | |

Roeper (1999) does not systematically investigate the inheritance of verbal properties by the derived nouns, as I do here following Grimshaw (1990), Marantz (1997), Harley and Noyer (2000), Alexiadou (2001) and later work. Many of his examples involve postposed particles in the verb, which move to become prefixes in the noun, as in (17), and he does not offer a unitary analysis of argument realization in the parallel nominal and verbal constructions, so I will not dwell more on his analysis.

Instead, I will follow the theory of argument realization summarized in §2.1 and assume that the differences between the individual ZNs that may or may not realize arguments come from their idiosyncratic properties – typical of derivations – as to whether they inherit the full event structure of the base verb or not, leading to ArgStr-Ns or Ref-Ns, respectively. It remains to be seen in future research whether the position of the particle has a real impact on argument realization, as Roeper (1999) claims. The evidence in (17)-(18) is insufficient, as we find many counterexamples, besides (19). While *outfit* is lexicalized as a Ref-N and fails to exhibit an event reading (see (19a)), the opposite pattern *fitout* realizes ArgStr in (20a) on a compositional event reading indicated by the aspectual verb *start*. Moreover, *burnout*, *drop-out*, *blowout*, *fade-out/fade-in*, *close-out*, *buildout*, and *rubout* also realize arguments on event readings, as shown in (20b-h) (contra (18)), where plain bold words represent diagnostics for event readings in examples where the external argument is not realized. When a ZN realizes both arguments on an apparent event reading parallel to that of the verb, as in (20h), I take this to indicate an ArgStr-N use, as usually assumed in the literature.

- (20) a. Boom Cycle have **started** *their **fitout** of a new 6,500 sq. ft. spinning and yoga studio.*
(<http://www.commercialnewsmedia.com/archives/87721>)
- b. [I]t will lead to a **slow *burnout*** of equipment in the long term. (GloWbE: IE)
- c. The restructured grant program will hopefully enable Australia to **avoid** *further **drop-out** of early- and mid-career researchers.* (NOW: AU)
- d. ... which caused the **blowout** of the well to later **occur** (GloWbE: US)
- e. It's no coincidence that the **fade-out** of solid studio teaching of art **has happened** with the **fade-in** of the marketing-curatorial direction of visual art. (GloWbE: US)
- f. [S/He] [p]erforms all other administrative duties [...] including [...], **daily *close-out*** of POS, bidding, ordering and receiving supplies and inventory controls (NOW: IE)
- g. By [...] encouraging a **rapid *buildout*** of renewable energy (GloWbE: GB)
- h. *Jaret Babych's **rubout** of Patrick McGillis* sent the Viper captain to the hospital (NOW: CA)

The data in (20) – next to (16a) and (19b-d) – show that, depending on the context, ZNs with postposed particles can realize compositional ArgStr-N readings, parallel to their verbs, contra Roeper's prediction. Similarly, not all ZNs with prefixed particles instantiate ArgStr-Ns. Many ZNs with a prefixed *out*, which is postposed with the verb, lack compositional event readings with argument structure: see Roeper's *outfit* in (19a), but also *outlet*, *outlook*, *outride*, *outreach*, in contrast with those in (17).

From the data in (16) to (20) I conclude that there is no one-to-one correspondence between an ArgStr-N or Ref-N use of a ZN and the position of the particle, since we see both types of ZNs, whether the

particle is prefixed or postposed. Like other derived nominals, ZNs may instantiate both root- and word-based derivations as in (5)-(6), and whatever argument licensing conditions are available for the verb should also apply in the case of the corresponding ArgStr-ZNs.

2.3. Argument realization in P-ZNs

Having shown that the position of the particle does not have an impact on the ArgStr-N/Ref-N status of P-ZNs, I present below an empirical overview of P-ZNs with their Ref-N/ArgStr-N readings. My resource is a database that currently includes $\pm 1,000$ ZNs. Its creation had two aims: to document the recent productive patterns of ZNs and to verify whether semantic verb classes display particular tendencies in the behavior of their ZNs.⁵ ZN-formation is productive: the database includes about 370 ZNs attested after 1900. About 25% of these are P-ZNs, which represents more than half of the overall number of P-ZNs, suggesting that P-ZNs have been particularly productive over the last century. For each ZN, we documented the types of readings they receive in relation to their base verbs and whether they appear in contexts that look like ArgStr-Ns. The readings were guided by their OED entries and classified into event- and participant-related. For my present purposes only the event readings are relevant, to the extent that they also display argument realization. In my discussion below, I disregarded P-ZNs that are not attested in the relevant corpora, which led to a list of 70+ ZNs with postposed and 40+ with prefixed particles.

About fifty of the ZNs with postposed particles are recorded with event-like readings in the OED. ZNs such as *roughout*, *mug-up*, *walk-on* (in theater), *ringback*, *rake-off*, *fuck-off*, *ring-off*, and *lay-away* receive only participant readings. An event reading, however, does not necessarily entail that such ZNs express verbal eventualities with event structure of the type found in ArgStr-Ns. As Grimshaw (1990) argues, lexical nouns like *trip*, *event* denote simple events, as in (4c), but not eventualities, and such examples are found among ZNs, too: e.g. *walkabout*, *walkout*, *bounceback*, *come-on*, *log-in*, *log-out*, *opt-out*, *pigout*, *row-off*, *stare-out*, *gross-out*, *takeaway* seem to refer to actions without encoding event/argument structure.

About twenty ZNs with postposed particles in my database also display ArgStr-N readings. Some were cited in (16a), (19b-d), and (20), and a few more are given in (22), which involve particles other than *out*. For some I found only examples in which the internal argument is realized alone (see (22a-d)), but for others we also find external arguments with *by*-phrases, as in (22e-g), or with a prenominal genitive, as in (22h-l) or (20h) above. These contexts were selected so as to indicate events, but some may be ambiguous and also allow Ref-N readings, not just ArgStr-Ns. Ideally additional event structure tests should be verified via introspection, but for this paper I concentrate on the diversity of the corpus data.⁶

- (22) a. [It] has no plans to launch *any do-over of the ballot proposal petitions*. (NOW: US)
 b. [W]e accept *the trade-off of delicious seafood gumbo for [...] enchiladas*. (NOW: US)
 c. to ensure the production and *sign-off of the plan* to ensure that it is appropriate (NOW: GB)
 d. Other ideas [...] call for *the throwaway of top-down economics*. (NOW: GB)
 e. *take-back of recyclable waste by contractors* (NOW: AU)

⁵The OED documents $\pm 2,800$ ZNs, but my collection also includes ZNs that OED lists as borrowed and not formed in English. The reasoning is that, even if a ZN like *change* was borrowed from French, it corresponds to a productive word formation process in English, which makes it perceivable to speakers as a native formation.

⁶A reviewer expresses doubts on the ArgStr-ZN use of *tradeoff*, as they argue that, in spite of accepting (22b), they do not accept the verb *to trade off* and would not allow a *by*-phrase in (22b). I have consulted two native speakers, who both can access the verb, and they consider *by*-phrases, prenominal genitives, and purpose clauses acceptable in (21), even if they find the constructions heavy:

- (21) a. The tradeoff of economic security for health *by the government* is a measure most citizens currently agree with.
 b. *The government's* tradeoff of oil for electric cars *in order to reach the environment protection targets by 2030*

- f. denouncing *the outrageous **frame-up** of Tommy Sheridan by the tabloid press* (GloWbE: IE)
- g. Will the world see a ***lock-in** of one nation by its own safety curtain?* (OED)
- h. *Celtic's **trade-in** of the stylish Dutchman* has left room for ... (NOW: GB)
- i. *the House Ways and Means Committee's first **markup** of the Republican tax plan* (NOW: US)
- j. [TSA] is defending *an officer's **pat-down** of a boy* at a Texas airport (NOW: CA)
- k. Aaron insists *his **rundown** of Babe Ruth* never would have transpired (COCA)
- l. That may have been the proximate cause of *their **takeover** of the banking system* (GloWbE: US)

My collection of ZNs with prefixed particles is balanced between participant- and event-related readings. Participant-denoting ZNs include *downvote, onlay, overarch, overbend, overbid, overcross, overfill, overfit, overpaint, overvote, under-bid, underbite, underspend, and understudy*, besides those with *out*, listed above. P-ZNs like *about-turn, overbloom, overcure, overdrive, overswing* refer to actions on a Ref-N reading, since they do not present argument structure. At least ten ZNs with prefixed particles exhibit ArgStr-N readings in corpora: see (23). Interestingly, ArgStr-ZNs with prefixed particles frequently instantiate a result state interpretation, which realizes the internal argument (e.g. *overkill, overspend, overspill, overturn*). (23) illustrates examples that come closest to eventive ArgStr-ZNs.

- (23) a. *My **download** of Sleater-Kinney's 'All Hands on the Bad One' **took half an hour.*** (COCA)
- b. the Province **begun the *upload* of court security [...]** *costs* (GloWbE: CA)
 - c. a means of **avoiding *overkill* of animal species** within hunting territories (GloWbE: CA)
 - d. the risks of *the **ongoing overshoot** of inflation* relative to the 2% target (NOW: GB)
 - e. *the **constant overspend** of the health budget* every year (NOW: IE)
 - f. they have experienced *some **overspill** of violence* from the hell that is Kingston (GloWbE: GB)
 - g. An injured man was recovered [...] **following the *overturn* of a work platform.** (GloWbE: GB)
 - h. *Kimi's **overtake** of Schui* at Spa shows who is the most naturally gifted driver (GloWbE: GB)
 - i. we have seen some **flooding** and ***overwash** of the seawall* (NOW: US)

This empirical overview shows that, although P-ZNs present ArgStr-N uses, these are not a majority. In my database, a little over 25% of the P-ZNs realize ArgStr-Ns. Their most frequent uses represent Ref-Ns (whether result entities or simple events), but these are not exclusive, as claimed in previous literature.

2.4. The competition with *-ing*

Grimshaw (1990) and Borer (2013) argue that ZNs always form Ref-Ns and, while I have already shown that this is not entirely true, the empirical overview above shows that most P-ZNs indeed exhibit Ref-N uses. The reason for this, I will argue, is not the covertness of their suffix, but the strong competition with the much more productive suffix *-ing*. An overt suffix is obviously at an advantageous position, due to its transparency for the form-meaning mapping. However, this does not mean that a covert suffix cannot embed complex event structure, as Borer (2013) claims in her system, which denies the separationist thesis between form and meaning in derivational morphology. In Borer's XSM, there is no derivational zero suffix;⁷ its categorizing function is taken over by the corresponding functional heads and, consequently, ZNs must be roots categorized by nominal functional material. In DM, a separationist theory, zero suffixes are just as motivated as overt suffixes, and the insertion of one or the other with different roots depends

⁷Her suggestion to handle the 'exceptional' ArgStr-ZNs with a zero suffix (Borer 2013:fn. 13, p. 331) would go into this direction, but she does not offer an implementation.

on various morphosyntactic or idiosyncratic factors (Alexiadou and Grimshaw 2008). My thesis is that the competition between overt and covert suffixes is similar to that between overt suffixes. The nominalization that competes with ZNs for the domain of P-verbs is the *ing-of*-gerund: see parallel examples in (24).

- (24) a. their *bailing out/bailout* of the banks
 b. the counsel's *overriding/override* of the veto

It is well-known that *ing-of* is the most productive pattern of derived nominals in English. The only restriction that it shows is with stative verbs and result states (Asher 1993:167, Alexiadou et al. 2013, Iordăchioaia and Werner 2019; cf. Borer 2013:168-169). The competition with Latinate suffixes in (25) (from Iordăchioaia and Werner 2019) shows that *-ing* fails to express the result state of the separating event, which is only expressed by *-ion*, while both suffixes express the event; the stative interpretation is diagnosed by the predicate *hold* in (25a), and the eventive one by *last* in (25b).

- (25) a. The {*separation*/**separating*} of the children held for 10 minutes. (result state)
 b. The {*separation*/*separating*} of the children lasted for 10 minutes. (event)

The suffix *-ing* has also been argued to primarily denote events (Borer 2013).⁸ The few Ref-Ns with *-ing* (e.g. *building*, *painting*) usually co-exist with ArgStr-N readings (cf. [*The building of the house*]/[*The painting of the portrait*] *took a long time*). The domain that remains to be covered only by Latinate nominalizations and ZNs in the competition with *-ing* is that of stative verbs as in (26) or the result state of eventive result verbs as in (25). On the event reading, however, we may even find pairs of ArgStr-Ns with both *-ing* and ZN forms, as shown by (24) and (27). Like Latinate suffixes, ZNs freely realize stative readings, which are not possible for *-ing*, as shown for psych verbs in (26b). For eventive result verbs like *kill*, *rewrite*, *download* in (27), the *-ing* nominalization only realizes the event reading, while ZNs may express both an event and a result entity.⁹

- (26) a. the {*depression/amazement*/**depressing*/**amazing*} of the people
 b. John's {*love/hate/hurt*/**loving*/**hating*/**hurting*}
- (27) a. the *kill***ing**, the *rewriting***ing**, the *download***ing** (event; #result entity)
 b. the *kill*, the *rewrite*, the *download* (event; result entity)

Given *-ing*'s predilection for encoding events and its full productivity, it is expected to realize ArgStr-N readings of eventive verbs by default. From the perspective of language change and language economy, the consequence for competing suffixes like zero in ZNs, which are less productive, is that they will not be used as freely as ArgStr-Ns and will rather specialize for Ref-N readings, for which *-ing* is not as productive. In a comparable scenario, Iordăchioaia and Werner (2019) argue that the suffix *-ing*, which in Old English productively formed Ref-Ns and stative nominalizations, was pushed towards the event domain by the emerging Latinate suffixes, which were borrowed with a result meaning component from French during Middle English.

⁸This must have led Grimshaw (1990) to (wrongly) take *-ing* to always instantiate ArgStr-Ns (her Complex Event Nominals).

⁹It remains to be investigated how the two patterns may differ from one another in this competition. One contrast is in terms of countability: while *-ing*-nominals usually behave like mass nouns on the ArgStr-N reading, ZNs are more easily countable: *a {murder/*murdering} of a cop*. In support of Grimshaw's (1990) generalization that ArgStr-Ns are mass nouns, Harley (2009) briefly argues that ZNs realize argument structure only on a mass interpretation but see Alexiadou et al. (2010) for evidence that, depending on their aspectual value, ArgStr-Ns may be countable, contra Grimshaw (1990).

2.5. Empirical sum-up

We can draw three conclusions from the empirical overview above. First, the absence of an overt suffix in ZNs is not incompatible with their realization of argument structure. P-verbs offer an interesting case of result verbs, which lexicalize both a manner and a result component (i.e. the verb and the particle, respectively), and about a quarter of the corresponding P-ZNs may realize their original argument structure. These facts are incompatible with the analysis in Borer (2013), in which ZNs involve no suffix and are categorizations of roots by nominal functional projections. Second, I have explained the lack of full productivity in forming ArgStr-ZNs by competition with the fully productive *-ing*-nominalization, which is restricted to events and incompatible with result readings. This makes *-ing* fully productive with ArgStr-Ns and leaves the domain of Ref-Ns to the competing ZNs, for which, however, ArgStr-Ns are not impossible – just not as productive as with *-ing*. Third, the possibility of P-ZNs to form ArgStr-Ns poses an additional challenge to both Borer’s system and the derivational dichotomy in (5)-(6), since we see a case of word-based derivation which triggers phonological changes on the root, and this is only expected in root-derivations. Namely, P-ZNs exhibit initial nominal stress, which means that they undergo stress shift, given that their verbs have level or final stress (Bolinger 1961, Cetnarowska 1993:34-35, Hurrell 2001).

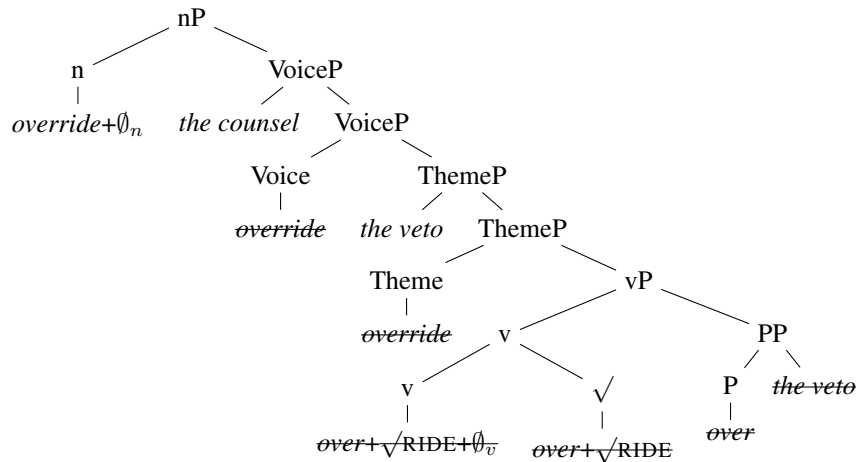
3. A syntactic analysis of ZNs with particles

In this section, I syntactically derive ZNs with prefixed and postposed particles, especially on their ArgStr-N readings, which are compositionally built on the functional structure of their base verbs.¹⁰ All the base verbs are of the result type, whereby the result component is introduced by the particle, and the verb’s root contributes manner. Following Svenonius (2003) and Roßdeutscher (2013), I assume the Split-P-Hypothesis and take particles to be intransitive prepositions, which realize one of the two prepositional functional layers PP and pP, depending on which argument they introduce. PP introduces the ground, and pP the figure argument. To implement Svenonius’s (1996) observation that verbs (and, implicitly, also their ArgStr-ZNs) with prefixed particles are more idiomatic than those with postposed particles (*uplift* vs. *lift up*), I analyze the former as building a compound with a particle and a root (see Steddy 2019 on nominal compounds): i.e. the particle moves to incorporate with the root of the verb before they get categorized together as a verb, as shown for *override* in (28). Following the DM reasoning for root-based derivations in (5), the meaning of the compound is negotiated when it gets categorized by *v*, as there is yet no fixed meaning for $\sqrt{\text{RIDE}}$.

It is unclear whether we should distinguish between categorized and uncategorized particle roots. As defective prepositions, particles realize one of the two functional layers and, by virtue of the locality of head movement, the root moves to P (or p) before reaching the verb. In (28), *over* then moves out of the PP, which introduces the ground argument *the veto*, and incorporates with the verb root. I use head-movement as conflation, by which the p(honological)-signature of the P head *over* conflates with that of the root $\sqrt{\text{RIDE}}$ (Hale and Keyser 2002, Harley 2004, Larsen 2014:§6.1). I take the defective P *over* and all bound morphemes (including roots) to have a [+affix] feature, by which they must undergo conflation. Since *over* and $\sqrt{\text{RIDE}}$ are both specified as [+affix], the one that moves is linearized to the left (vs. (31); see Roeper 1999). This compound then moves to *v* and to the following [+affix] heads up to *n*. The resulting ZN inherits the meaning and the associated event and argument structure of the P-verb. In the absence of a p head, the ground argument *the veto* cannot receive case in its base position and must move to Spec ThemeP in the verbal domain (see Svenonius 2003, cf. Biskup and Putnam 2012 and Roßdeutscher 2013).

¹⁰I am very indebted to two reviewers for their constructive criticism, which led to a substantial improvement of this analysis.

(28) the counsel's override of the veto



A possible argument against incorporating the particle into the verb's root before categorization is the existence of a few P-verbs with the overt verbalizer *-en*, such as *oversweeten*, *overripen*, *overdeepen*, *outsweeten*. Following the OED, the first two also have corresponding adjectives *oversweet* and *overripe*, attested well before the verbs, which supports my analysis for the compound formation before categorization (as an adjective or a verb). Their semantics does not show any scope interaction between the particle and the verbalizer: to make excessively sweet (*oversweet+en*) and to excessively make sweet (*over+sweeten*) are synonymous. *Overdeepen* and *outsweeten* have no compound adjectives but none of these P-verbs with overt verbalizers form ZNs, so I will not dwell on them any further.

While in (28) the particle *over* realizes the ground argument, it may also introduce the figure: see examples such as (23c-g), where the ground remains implicit, a configuration that is in fact more usual than ground promotion in English (McIntyre 2007). Following Svenonius (2003) and Roßdeutscher (2013), I assume that the particle originates within a pP introducing the figure argument, for which the same movement operations apply as in (28). Thus, the example in (23g) receives the representation in (29). Given the anticausative reading in (23g)/(29a), the structure lacks a VoiceP (see Alexiadou et al. 2015:§2.2).

(29) a. the overturn of a work platform

- b. [_{DP} *the* [_{nP} *overtun* +Ø_n [_{ThP} *a work platform* [_{ThP} *overtun* [_{vP} [_v *over+√RIDE*] [_{pP} *a work platform* [_p *over*]]]]]]]]]

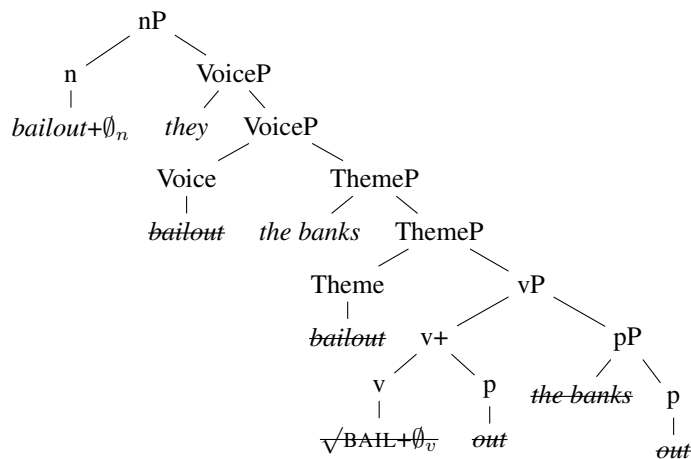
I now turn to the derivation of ArgStr-ZNs with postposed particles. In contrast to verbs with prefixed particles, those with postposed particles are semantically compositional (Svenonius 2003), which suggests that they must be categorized when they combine with the particle. In support of this, such particle verbs may easily include overt verbalizers: see *to soften up*, *to straighten up*, *to flatten out*, some of which also form ZNs (see (30) from the internet, which my consultants judge acceptable).¹¹ Linear order clearly shows that the particle attaches after the verbalizer, unlike with *oversweeten* and *overripen* above.

- (30) a. I throw all my fitteds regardless of the brand in the dryer every couple of months for *a soften up* (<http://www.essentialbaby.com.au/forums/index.php?/topic/644121-second-hand-baby-beehinds/>)
- b. New towels were provided every day, as well as *a straighten up of the bed* (https://www.tripadvisor.co.uk/ShowUserReviews-g186338-d285524-r724451834-Queens_Hotel-London_England.html)

¹¹I am grateful to an anonymous reviewer for pointing out such examples to me, which are not recorded in the OED.

Let us take the ZN *bailout* in (16a), repeated in (31). The morphosyntax that such ZNs are built on is one in which the verb and the particle are inseparable. To account for this, I assume that the two parts form a complex head, which I symbolize with *v+*, as in Larsen (2014). Several versions of the complex head analysis have been proposed for particle verbs (see McIntyre 2013 and Larsen 2014:§2.2 for discussion). Here I follow Larsen’s analysis, which is more explicit in implementation (Larsen 2014:210-215), with the only difference that I take the whole *v+* head to move further up to *n*. This accounts for the fact that ZNs show inflection at the rightmost edge (*bailouts* vs. **bailsout*).¹² Following the idea of head-movement as conflation, the particle *out* is specified as [+affix] and it will move to conflate with the verb. Since it is affixal, the particle will be linearized to the right. Like in the case of incorporated particles, the figure argument of the particle moves into the verbal domain to receive structural case. These verbs and their ZNs are more likely to promote the figure argument, as in (29) (see (22); cf. Svenonius 2003, McIntyre 2007).

(31) their bailout of the banks



As argued in Grimshaw (1990), most – if not all – deverbal nominals instantiate non-compositional Ref-N readings, besides their compositional ArgStr-N uses. The same is the case with P-ZNs, as noted above: for instance, *override* contributes a Ref-N meaning in root compounds such as *override code*, *override commission*, *override switch*, and *bailout* shows ‘participant’ readings such as ‘means to rescue from a crisis’ or ‘money given as such assistance’. As I have not closely investigated the morphosyntax of these readings, I will simply suggest that they are instances of inner-cycle derivations, as in (5), to contrast with (28), (29) and (31), as subcases of (6). I argued that the particle incorporates into the verbal root to form a compound in *override*, while it forms a complex head with a categorized verb in *bailout*. Since it is not obvious how we could test whether the particle is categorized or not, I would argue that once a compound like *override* becomes available, so does a corresponding compound with the two roots merging together. That is, this compound enters the encyclopedia (see Borer 2013:§9.3.3) and can be picked up in a root-based derivation to form a noun, as in (32a). The same would hold for *bailout* in (32b). One possible complication is for P-ZNs with postposed particles which include an overt verbalizer such as *soften up* and *straighten up*. Further study needs to determine whether such ZNs, which are rarely attested, receive Ref-Ns readings. If they do, then the compound *v+p* itself must enter an inner-cycle derivation as in (32c), which brings a complication for the DM principle behind (5), in that the first categorization of *v* and *p* would not block an idiosyncratic Ref-N interpretation at the next categorization level by *n*. Further such challenging formations are pointed out in Harley (2009) and Borer (2013), and Marantz (2013) presents some solutions.

¹²Larsen accounts for the verb’s stem acquiring inflection (*bails out* vs. **bail outs*) by arguing that only the verb moves higher up.

- (32) a. $[_n \emptyset [_\sqrt{\text{OVER}} + \sqrt{\text{RIDE}}]]$
 b. $[_n \emptyset [_\sqrt{\text{BAIL}} + \sqrt{\text{OUT}}]]$
 c. $[_n \emptyset [_v + [_v \textit{soften}]] [_p \textit{up}]]]$

A last point that I want to address is the apparent incompatibility of the complex event structures in (28), (29), and (31) with the presence of stress shift in ArgStr-ZNs that involve particles. Both in Borer’s XSM and in DM, a word-based derivation as in (6), which embeds functional structure above the level of root categorization, should not be able to affect the phonology of the root, since it is non-local (Embick 2010, Marantz 2013). More study is necessary to understand the phonological conditions that trigger or block stress shift in ZNs (cf. Bolinger 1961, Hurrell 2001). The presentation in §2, however, suggests that stress shift is independent of the presence or absence of argument structure. Namely, Borer’s (2013) analysis would predict that ZNs such as *override* or *bailout* should block stress shift on their ArgStr-N reading, but may allow it on their Ref-N reading, which never happens, since the same phonology applies to both.

To account for the availability of stress shift with outer-cycle derivations as in (28), (29), and (31), I follow Embick (2010:58-60), who argues that suffixes that attach in the outer cycle of a derivation may trigger phonological changes on the root, if the intervening functional heads are realized by null morphemes. That is, null exponents are transparent for certain linear relations that involve phonological changes, i.e. allomorphy. Embick introduces a *pruning rule*, by which such null intervening nodes get eliminated, allowing, for instance, the Tense node to become local to the root and yield an irregular form of this root, if it is verbalized by a null suffix: e.g. *ring* – *rang*. When the verbalizer is overt like *-ize* or *-ify*, allomorphy is not possible anymore, leading to regular past tense forms: e.g. *realize* – *realized*, *verify* – *verified*.

If we take the same mechanism to apply in (28), (29), and (31), where *v*, Theme, and Voice are null, we have an explanation for why ZNs may involve stress shift and realize argument structure at the same time. A test case would be ZNs derived from verbs with overt verbalizing suffixes. As Borer (2013) points out, ZNs typically cannot be derived from such verbs (cf. her examples *to crystallize* – **the crystallize*, *to acidify* – **the acidify*). However, a reviewer thankfully points out that the internet offers examples of P-ZNs with postposed particles and verbs that include the overt verbalizer *-en*, as in (30). My prediction, following Embick’s pruning rule, is that these ZNs should not involve stress shift. This prediction is confirmed by my consultants, who report that the ZNs in (30) preserve the same stress pattern as the verb. In conclusion, Embick’s pruning rule successfully accounts for ArgStr-N readings of P-ZNs that involve stress shift.

4. Conclusion

This paper presented a case study of zero-derived nominals with prefixed and postposed particles. P-ZNs challenge previous insights on ZNs, according to which they instantiate only Ref-Ns and never inherit event structure properties from their verbs in the shape of ArgStr-Ns. First, about a quarter of the P-ZNs in the database introduced here exhibit ArgStr-N uses in corpora, although Ref-Ns readings are indeed more frequent. I have explained this tendency of P-ZNs towards Ref-N interpretations by competition with the fully productive *ing*-nominalizations, which always encode events, drifting ZNs towards Ref-N readings, with which *-ing* is not as productive. Second, ArgStr-ZNs with particles pose a challenge to the split between outer-cycle and inner-cycle derivation, since they typically involve stress shift, which is not expected in derivations with complex event structure of the kind they realize. At the end of §3, I offered a solution, in which I follow Embick’s (2010) insight that null functional structure intervening between a derivational morpheme and the root is transparent to allomorphy. Third, the ability of ZNs to realize ArgStr-Ns supports the prospect of a zero derivational suffix whose behavior is comparable with that of overt suffixes in realizing both compositional ArgStr-Ns and idiosyncratic Ref-Ns. Importantly, the empirical picture of ZNs is much more diverse than predicted by the account in Borer (2013), which takes them to be implicit categorizations of roots in the categorial space of a nominal functional head. The next step is to investigate ZNs derived from prefix verbs (e.g. *rewrite*, *declutter*), whose prefixes most likely also

contribute resultative meaning and seem to bear much resemblance to the P-ZNs addressed here.

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