The building blocks of word meaning: insights from ambiguous nominalizations

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1 Introduction

- In this paper, I explore the semantic interpretation of sortally ambiguous nominalizations in syntactic approaches to word formation in which there is no generative lexicon but word formation is entirely syntactic (i.e. in the tradition of Halle and Marantz [1993], Hale and Keyser [1993], Marantz [1997], Alexiadou [2001], Borer [2005]).
- Sortally ambiguous nominals are a challenge to syntactic approaches to word formation:
  - Without a generative lexicon, the ambiguity of words cannot be rendered as a lexical ambiguity. Instead, the ambiguity of words must be derived from different analyses of the same surface morphology: *Structural Disambiguation Principle*
  - "[T]he analysis and structures proposed for a form must also be contained within the analysis of any structure derived from that form" [Harley, 2009, p. 320]. In particular, this implies that different analyses of the same surface morphology must be intergradient (i.e. derived from each other in hierarchical order) in order to avoid a lexical ambiguity in the form of a disjunction of analyses for one and the same form: *Containment Principle*

2 Sortal Ambiguity

- Lexicalist approaches to word meaning such as e.g. Pustejovsky [1995], Asher [2011] assume that the following is specified in the generative lexicon:
  - a many-sorted ontology of denotations
  - a specification of acceptable sorts of possible fillers of argument slots of words
  - a specification of the sorts of denotations of a word
  - a lexical process that checks for sortal coherence of predicate and argument according to a head-typing principle and triggers coercion of sorts when necessary
- Assuming an ontology comprising amongst others events, their result states and the objects in which these result states manifest themselves (i.e. result objects), Ehrich and Rapp [2000] propose that the data in (1) shows that the German *-ung* nominalization *Bemalung* ('painting') is ambiguous between three different denotations
- *Bemalung* ('painting') is derived from the root $\sqrt{mal}$ ('mark') by prefixation with *be-* and suffixation with the nominalizer morpheme *-ung*.
- (I leave out Ehrich and Rapp [2000] process denotation because it is derived from a different variant of the lexical entry of *bemalen* identifying a manner verb.)

(1) a. *Die Bemalung der Wand wurde unterbrochen.*
the be.PRFX.mark.ung.NMLZ the.GEN wall.THEME was interrupted.EVENT

The painting of the wall was interrupted.

b. *Die Bemalung der Wand besteht unverändert fort.*
the be.PRFX.mark.ung.NMLZ the.GEN wall exist.STATE unchanged on

The painting of the wall remains unchanged.

c. *Die Bemalung der Wand wurde entfernt.*
the be.PRFX.mark.ung.NMLZ the.GEN wall was removed.OBJECT

The wall painting was removed.

- *unterbrechen* ('interrupt') selects for an event → event denotation of *Bemalung* in (1a)
- *fortbestehen* ('persist') selects for a state → result state denotation of *Bemalung* in (1b)
- *entfernen* ('remove') selects for a physical object → result object denotation of *Bemalung* in (1c)
- Ehrich and Rapp [2000] capture the ambiguity of *Bemalung* with the postulation of three lexical entries in which either the event argument, the state argument or the object argument of the base verb *bemalen* (to paint sth. with sth.) is grammatically available, see (2)
- (In their framework, only grammatically available arguments of the logical form are bound by λ-abstraction. r is a situation argument for a process, e for an event, s for a state. The λ-bound argument in brackets realizes the genitive DP.)

(2) a. $\lambda y \lambda x \lambda e[DO((x,y)r) \wedge BECOME((APPL((z,y)s))e)]$; base verb *bemalen*

b. $(\lambda y)\boldsymbol{\lambda e}[DO((x,y)r) \wedge BECOME((APPL((z,y)s))e)]$; event denotation *Bemalung*

c. $(\lambda y)\boldsymbol{\lambda s}[DO((x,y)r) \wedge BECOME((APPL((z,y)s))e)]$; result state denotation *Bemalung*

d. $(\lambda y)\boldsymbol{\lambda z}[DO((x,y)r) \wedge BECOME((APPL((z,y)s))e)]$; result object denotation *Bemalung*

- In syntactic approaches to word formation in which there is no generative lexicon, a disjunction of lexical entries as in (2) is not an option to capture the ambiguity of *Bemalung*.
- Instead, the different meanings of *Bemalung* must emerge from a structural differentiation of the analysis of *Bemalung* under consideration of the principle of containment.
- Furthermore, in a syntactic approach to argument structure, structural differentation should also account for a further ambiguity that Ehrich and Rapp [2000] do not (need to) account for.
- Only for the event denotation of *Bemalung* in (1a) is the post-nominal genitive an argument - the Theme - of the nominalization (cp. Grimshaw [1990], Alexiadou [2001]).
- Given that the differences in meaning must emerge from a structural differentiation below the word level, the 'building blocks' of meaning from which these structures are built are smaller than semantic forms in lexicalist approaches.
- How can we identify the type and hierarchy of building blocks contained in a given nominalization?

3 What's in a nominal: the lexicalist perspective

- Hamm and Solstad [2010]'s observation of co-predication of nominals with divergent sorts by anaphoric reference to a nominal that is sortally divergent from the anaphor:

(3) a. *Die Bemalung*$_1$ *der Wand war zwar anstrengend, aber sie*$_1$ *wird*
the be.PRFX.mark.ung.NMLZ the.GEN wall was indeed exhausting.EVENT but it will
nicht lange halten und deswegen hat der Hausmeister sie$_1$ *entfernt.*
not long last.STATE and therefore has the janitor it removed.OBJECT.

The painting of the wall$_1$ was in fact exhausting, but it$_1$ won't last for a long time and therefore the janitor removed it$_1$.

b. **Die Bemalung der Wand*$_1$ *besteht seit Jahren und der Hausmeister*
the be.PRFX.mark.ung.NMLZ the.GEN wall exists.STATE for years and the janitor
fand sie$_1$ *anstrengend.*
found it exhausting.EVENT

The painting$_1$ of the wall exists for years and the janitor found it$_1$ exhausting.

c. *Die Bemalung*$_1$ *der Wand besteht seit Jahren aber jetzt hat der*
the be.PRFX.mark.ung.NMLZ the.GEN wall exists.STATE for years but now has the
Hausmeister sie$_1$ *entfernt.*
janitor it removed.OBJECT

The painting of the wall$_1$ exists for years but now the janitor has removed it$_1$.

d. **Die Bemalung*$_1$ *der Wand hat der Hausmeister entfernt obwohl*
the be.PRFX.mark.ung.NMLZ the.GEN wall have the janitor removed.OBJECT although
sie$_1$ *anstrengend war.*
it exhausting.EVENT was

The wall painting$_1$ was removed by the janitor although it$_1$ was exhausting.

e. ?*Die Bemalung*$_1$ *der Wand wird renoviert denn sie*$_1$
the be.PRFX.mark.ung.NMLZ the.GEN wall will be renovated.OBJECT because it
besteht seit Jahren.
exist.STATE since years.

The wall painting$_1$ will be renovated because it$_1$ exists for years.

- Intuitively, the data in (3) reflects the natural and actual order of things in that an event brings about a result state and that result state manifests itself in a result object (see Pross [2013]).
- In (3a), *anstrengend* ('exhausting') selects for an event denotation of the nominalization, anaphoric reference with *lange halten* ('to last for a long time') selects for a state denotation and anaphoric reference with *entfernen* ('remove') selects for an object denotation.
- In contrast, if the anaphoric referent is introduced as a state as in (3b), then no anaphoric reference to an event is possible
- However, introduction of the anaphoric referent as a state allows for anaphoric reference to the result object (3c).
- Finally, if the anaphoric referent is introduced as a result object, then no anaphoric reference to an event (3d) is possible and reference to a result state (3e) is at least questionable.
- All in all, the possibilities of anaphoric reference indicate that the event denotation must contain an event, state and object block, the state denotation a state and an object block and the object denotation only an object block.
- That is, the data in (3) diagnoses the types of building blocks and their hierarchical containment in *-ung* nominalizations.
- But the diagnosis in (3) doesn't reveal the realization of building blocks at the morphology-syntax-semantics interface
- In order to assess the word-internal realization of ontological building blocks, we need to take into account the function of the *be-*/*-ung* morphology

4 What's in a nominal: the morphosyntactic perspective

4.1 Meaning and function of the *be-* morpheme

- *be-* induces a passive-like transitivity shift of an underlying location into the direct object position, replacing the theme and promoting a PP object to direct object status.
- *be-* is a prefix morpheme which roughly corresponds to the *with*-variants in *spray/load* alternations (see e.g. Günther [1974], Wunderlich [1987], Dewell [2015]), cf. (4).

(4) a. Peter loaded hay on the truck.

b. *Peter ludt Heu auf den Wagen.*
Peter loaded hay on the truck
Peter loaded hay on the truck.

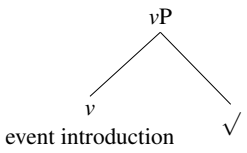
c. Peter loaded the truck with hay.

d. *Peter beludt den Wagen mit*
Peter be.PRFX.loaded the truck with
Heu.
hay
Peter loaded the truck with hay.

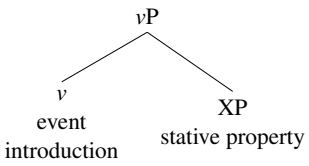
4.2 Meaning and function of the *-ung* morpheme

- *-ung* is a productive nominalizer morpheme that applies to syntactically bi-eventive constructions but not mono-eventive constructions (Roßdeutscher [2010]).
- Bi-eventivity is understood in terms of Roßdeutscher [2010]'s semantic interpretation of Marantz [2005]'s syntactic account of mono- and bi-eventivity.
- In a mono-eventive constructio, the root modifies v as in (5)
- In a bi-eventive construction, a morphologically empty v is merged with an XP denoting a stative property as in (6)

(5)



(6)



5 Structural disambiguation, first attempt

- In syntactic approaches to word-formation, it is often assumed that functional heads in the syntax are responsible for the introduction of a particular sort of discourse referents, e.g.
  - v is a verbalizer head that introduces events
  - n is a nominalizer head that introduces objects
- Wunderlich [1987] proposed that the *be-* morpheme is prepositional because it 'incorporates'the preposition of the locative PP
- Data as in (8) furthermore suggests that *be-* introduces the state required for a bi-eventive construction (Roßdeutscher [2010], similar assumptions are made about the prefix *ver-* in Alexiadou et al. [2014])
- (7a) is mono-eventive and lacks an *-ung* nominalizations (7b) whereas (8a) is bi-eventive and thus has an *-ung* nominalization (8b), with the only morphological difference being the *be-*prefix.

(7) a. *malen*
paint
to paint

b. **Malung*
paint.ung.NMLZ
painting

(8) a. *bemalen*
be.PRFX.paint
to paint sth. with sth.

b. *Bemalung*
be.PRFX.paint.ung.NMLZ
painting

- Consequently, it could be assumed that the XP in the bi-eventive construction is a state-denoting PP headed by *be-*.
- But then, as a reviewer correctly noted, if *be-* realizes a P-head which introduces a state, what does the PP do in the result object denotation of the nominalization in which there is no state building block although the *be-* is still there?
- Under the containment principle, we cannot assume that *be-* has a different function in one derivation of the same surface than in another, as this would require the postulation of a 'sublexical' ambiguity of *be-*.
- To account for this observation, I argue that *be-* is a participle morpheme and that the participle meaning of *be-* is independent of the introduction of a result state.
- Then, I decompose the aspectual and stative aspects of the meaning of *be-* in the syntax and thus avoid the problematic assumption about *be-* realizing a PP that denotes a state.

5.1 *be-* as a participle morpheme

- A considerable number of *be-*verbs occurs more or less exclusively in the form of a participle (cp. Günther [1974]), see (9).

(9) *berühmt* (famous), *betrunken* (drunk, and its many synonyms), *bekannt* (popular) *bewußt* (aware of), *begabt* (gifted), *betagt* (elderly), *befangen* (biased, and many other verbs of emotional affectedness), *behämmert* (batty), *bebrillt* (bespectacled, and many other verbs of affixation of an article or clothing), *bemehlt* (floured, and similar verbs characterizing the presence of a certain property or feature)

- Because *be-*verbs as in (9) appear only as participles, none of the *be-*verbs in (9) alternates with the prepositional construction and thus *be-* cannot be the incorporation of a preposition.
- In turn, this renders the assumption that *be-* has a preposition-like status implausible.
- Instead, the *be-* prefix is in complementary distribution with the standard German participle morpheme *ge-* but realizes the same range of participle constructions:

- Verbal participle in (10a)/(11a)
- Adjectival passive participle in (10b)/(11b)
- Prenominal use of the adjectival passive participle in (10c)/(11c)

(10) a. *Peter hat (eine Blume) gemalt.*
Peter has (a flower) ge.PRFX.PART.painted

Peter has painted (a flower).

b. *Die Blume ist (*immer noch) gemalt.*
the flower is (*still) ge.PRFX.PART.painted

The flower is (*still) painted

c. *Die gemalte Blume*
the ge.PRFX.PART.painted flower

the painted flower

(11) a. *Peter hat *(die Wand) bemalt.*
Peter has *(the wall) be.PRFX.PART.painted

Peter has painted the wall.

b. *Die Wand ist (immer noch) bemalt.*
the wall is (still) be.PRFX.PART.painted

the wall is (still) painted

c. *Die bemalte Wand*
the be.PRFX.PART.painted wall

the painted wall

- However, despite the superficial similarity of the *ge-/be*-participles, they are semantically different for verbs that are mono-eventive without prefixation:
  - (10b) expresses a resultant state whereas (11b) denotes a target state according to the *immer noch* test Kratzer [2000]
  - (Where a target state can be identified independent of the event which caused it whereas a resultant state is defined relative to the event which caused it.)
- (For bi-eventive verbs, the semantic difference is in the affectedness entailment, cp. *der (*fast) geladene Wagen* (the (*nearly) loaded truck) vs. *der (fast) beladene Wagen* (the (nearly) be.PRFX.loaded truck))

6 Parallel derivation of nominalizations and their underlying sentences

- To motivate the internal structure of building blocks in *Bemalung*, I propose to correlate the participle function of the *be-* morpheme with the internal structure of *Bemalung* under the assumption that "nominalization transforms a sentence into a noun phrase" [Vendler, 1967, p. 125] and thus nominalizations are "noun-like versions of sentences" [Lees, 1960, p. 54].
- (A similar idea underlies the analysis of argument structure in nominals in Grimshaw [1990], Alexiadou [2001])
- The idea spelled out in the following is to identify the morphosyntax of *Bemalung* with the morphosyntax of the participle *bemalen*-sentence that it nominalizes.
- If such a parallel analysis can be achieved, each derivation step in the nominal containment hierarchy of building blocks also derives the semantics of the underlying nominalized sentence and vice versa.
- Then, we can use the sentential analysis to infer information missing in the nominal analysis and vice versa.
- The parallelism I would like to propose is given with the pairs (12a)-(13a), (12b)-(13b), (12c)-(13c).

(12) a. *Peter hat die Wand schrittweise bemalt.*
Peter has the wall incrementally be.PRFX.PART.painted

Peter painted the wall step-by-step.

b. *Die Wand ist seit Jahren bemalt.*
the wall is for years be.PRFX.PART.painted

The wall is painted for years.

c. *Die bemalte Wand wird renoviert.*
the be.PRFX.PART.painted wall is being renovated.

The painted wall is being renovated.

(13) a. *Die Bemalung der Wand durch Peter erfolgte schrittweise.*
the be.PRFX.paint.ung.NMLZ of the wall by Peter took place incrementally

The painting of the wall by Peter took place step-by-step.

b. *Die Bemahlung der Wand besteht seit Jahren.*
the be.PRFX.paint.ung.NMLZ of the wall exists for years

The painting of the wall exists for years.

c. *Die Bemalung der Wand wird renoviert.*
the be.PRFX.paint.ung.NMLZ of the wall is being renovated

The wall painting is being renovated.

- *Event denotation:* (12a) describes an event (testified by modification with *schrittweise* (incremental)) in which Peter's action causes the wall to be completely painted (which is the result state of the event). The same event is described by the event denotation of the nominalization (13a) (although in a passive mood, I'll come to this later).
- *Target state denotation:* (12b) denotes the target state of paint having been applied to the wall. The same state is described by what we identified as the result state denotation of the nominalization.
- In fact, the diagnosed lack of an event building block in the state denotation of the nominalization corresponds to the way in which target states are conceptualized (i.e. independently of the causing event).
- Consequently, the perceived result state denotation of the nominalization is better conceptualized as a target state denotation (a shift not only in terminology I adopt from now on) and I take (13b) to be the nominalization of (12b).
- Finally, what is the derivational relation between (12c) and (13c)?
- Consider the data in (14)

(14) a. *Die bemalte Wand wurde entfernt (*ohne die Wand zu beschädigen).*
the be.PRFX.PART.painted wall was removed (*without the wall to damage)

The painted wall was removed (without damaging the wall).

b. *Die Bemalung der Wand wurde entfernt (ohne die Wand zu beschädigen).*
the be.PRFXpaint.ung.NMLZ of the wall was removed (without the wall to damage)

The wall painting was removed (without damaging the wall).

- *Object denotation:* The physical object which is removed in (14a) is the wall itself. This is in conflict with the result object denotation of the nominalization because in (14b) it is not the wall which is removed.
- In (14a), *bemalt* denotes a property of the wall whereas in (14b), *Bemalung* denotes an object.
- Under the containment principle, we need to derive both denotations from a common structural core.
- To account for the difference between (14a) and (14b) I propose to derive the object denotation of the nominalization *Bemalung* from the property denotation of *bemalt*.
- To this end, I reconsider the function of the *-ung* nominalizer morpheme.
- Syntactically, the *-ung* morpheme transforms a given expression into a noun phrase, but what is the semantic reflection of this transformation?
- The semantic function of the transformation of a given expression into a noun phrases is to make available a quantifiable discourse referent that represents the transformed expression.

- Instances of such transformations are called *reification*, i.e. "to regard (something abstract) as a material or concrete thing" (Merriam-Webster)
- A prime example of the use of reification for the introduction of quantifiable discourse referents is Davidson [1967].
- (15b) is the reification of (15a) and the reified nominal *flight* makes available a quantifiable discourse referent for an event.

(15) a. Amundsen flew to the Northpole

b. A flight by Amundsen to the Northpole

- In the same vein, I propose that the semantic function of the *-ung* morpheme is to reify the semantic interpretation of the structure with which it is merged so as to make available a quantifiable discourse referent corresponding to the denotation of the nominal.
- For the case under consideration (14), *-ung* reifies the property denoted by the adjectival use of the participle as a physical object, namley that object in which the property manifests itself.
- (From this point of view, *-ung* has the same reification function for the event and state denotation of *Bemalung*, where events and states manifest themselves as spatiotemporal objects.)
- I conclude that the answer to the question for what the *be-* does when there is no state building block is that *be-* introduces a property (*Bemaltheit*/paintedness).
- Furthermore, *be-* syntactically functions as a participle morpheme.
- Finally, the function of the *-ung* morpheme is to reify the structure with which it is merged.

7 Analysis at the Syntax-Semantics Interface

- (For more details on the syntax-semantics interface, see the Appendix)

7.1 Derivation of property denotation

- Putting things together, the diagnosed containment of building blocks and their morphosyntactic realization in *Bemalung* gives rise to the analysis in (17) in which the first step is to insert the the root $\sqrt{}$mal into an nP template, giving rise to the object-denoting underived nominal *Mal* ('the mark').
- *be-* is realized as an applicative participle head Part(iciple) which turns the denotation of the root n(oun)P into a property (i.e. a function from individuals to possible worlds, represented with the intensional abstraction operator $^\wedge$).
- This property is explicitly realized with a discourse referent p introduced by an a(djective)P which takes PartP as a complement.
- If aP is nominalized with *-ung*, we get the analysis in (17)
- The *-ung* reifies its complement structure as an object-denoting noun phrase.
- I leave open the exact specification of the reified discourse referent with the underspecified referent β, because the exact specification depends on the selection restrictions of the predicate which takes β as a argument (but as we have reached the word-level, we could in principle plug in the framework of Asher [2011] to deal with semantic coherence)
- If (17) weren't nominalized, it would provide the structure necessary for the derivation of the adjectival use of the *be-* participle as in *die bemalte Wand* (the painted wall).
- The genitive DP in (17) is in an adjunct position and receives the default possessive interpretation provided by genitive case, i.e. possession of the reified property.

7.2 Derivation of target state denotation

- According to the containment principle, the target state reading of *Bemalung* must be derived from the structure in (17) up to aP.
- To derive the target state denotation of *Bemalung*, aP merges with an applicative PP as in (18) and is then nominalized with *-ung*.
- If (18) weren't nominalized, it would derive the adjectival passive participle target state construction *Die Wand ist bemalt* (The wall is painted).
- The target state denoted by (18) is a relation in which paint has been applied to the wall

- The target state semantics is testified by specification with a PP describing the type of painting (16a), a specification which is not possible for the reified object denotation in (16b).
- Furthermore, the oddness of event modification with instrumental PPs as in (16a) is predicted by the lack of an event block in the derivation.

(16) a. *Die Bemalung der Wand (mit Blumen)/(*mit Pinseln) besteht seit Jahren.*
the be.PRFX.paint.ung.NMLZ of the wall (with flowers)/(*with brushes) exists for years

The wall painting (with flowers)/(*with brushes) exists for years.

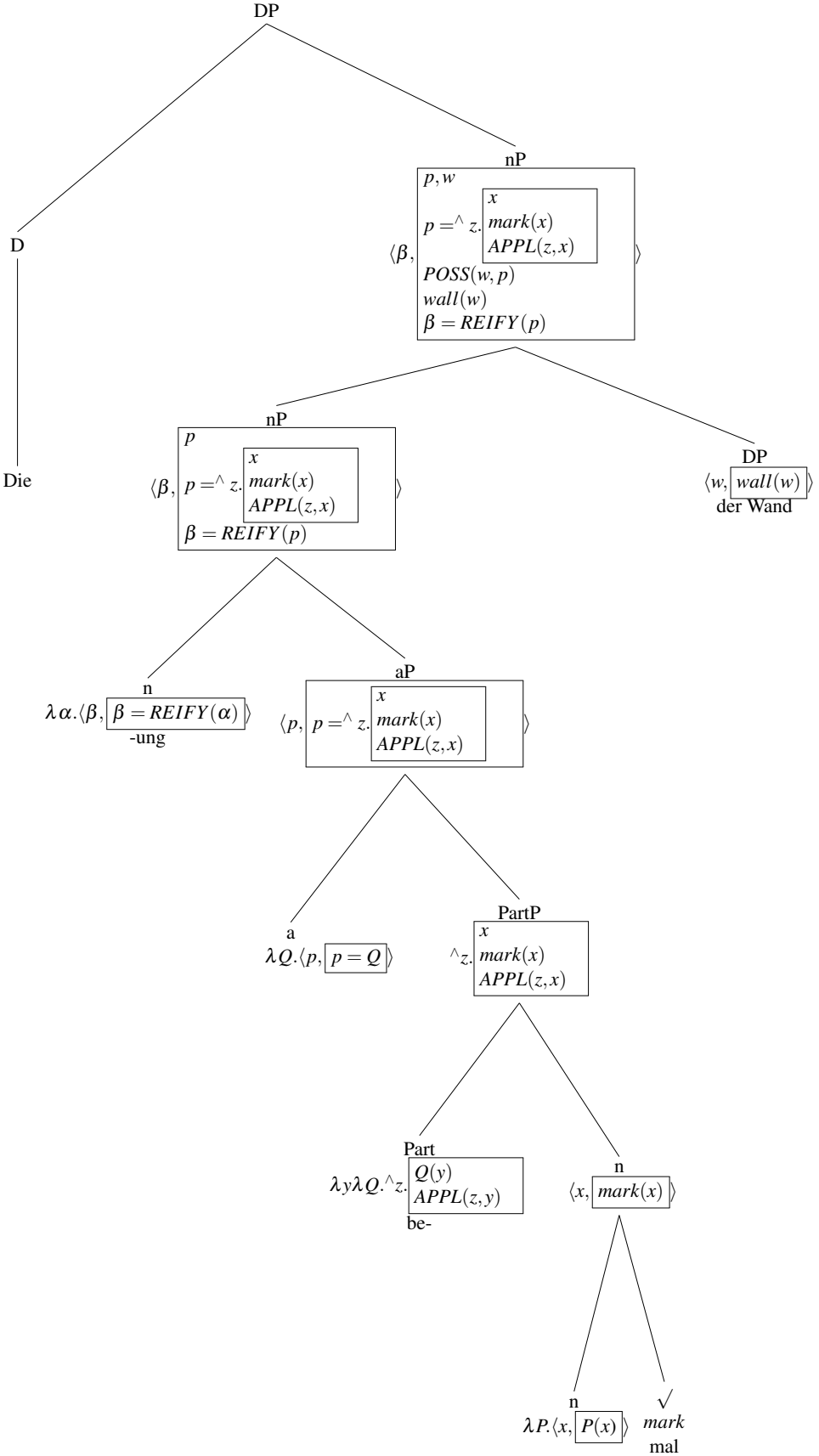
b. *Die Bemalung der Wand (*mit Blumen) wird entfernt.*
the be.PRFX.paint.ung.NMLZ of the wall (*with flowers) is being removed

The wall painting (*with flowers) is being removed.

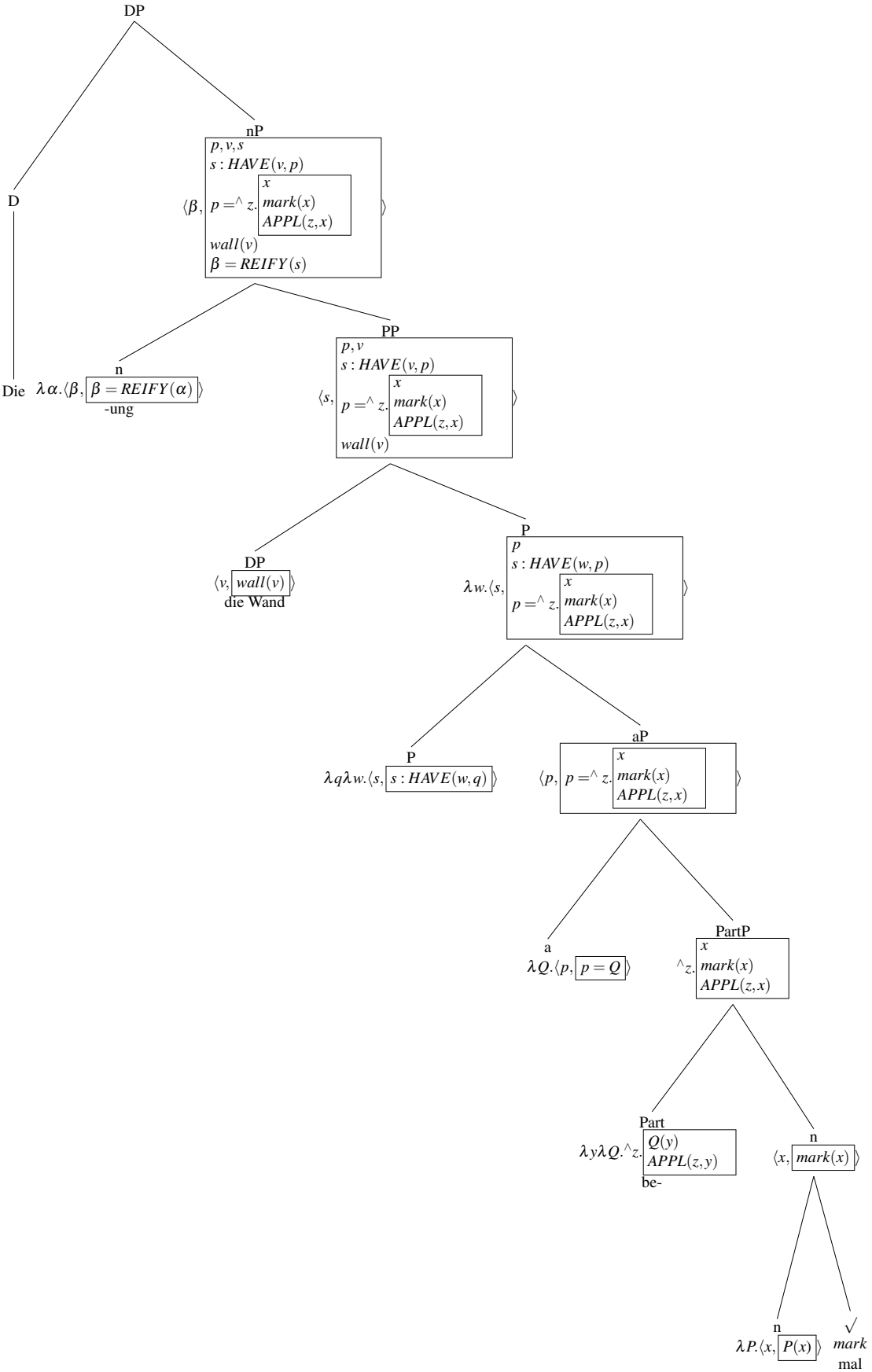
7.3 Derivation of event denotation

- The event denotation is derived from the structure in (19) up to PP if the target state PP merges with vP as in (19).
- v introduces an event e and the target state introduced by the PP is identified with the result state caused by e.
- The DP projected by P in (19) has argument status and receives a theme interpretation in the structural position Spec,Comp,vP.
- If (19) weren't nominalized, then it would derive the active transitive use of *bemalen*.
- (From this point of view, a possible explanation for why nominalizations are passive constructions (see e.g. Alexiadou [2001], Alexiadou et al. [2014]) is that the nominalizer cuts off the further derivation of the verbal spine. Thus, an agent/causer must by represented as in passives with a *durch*/by-PP.)

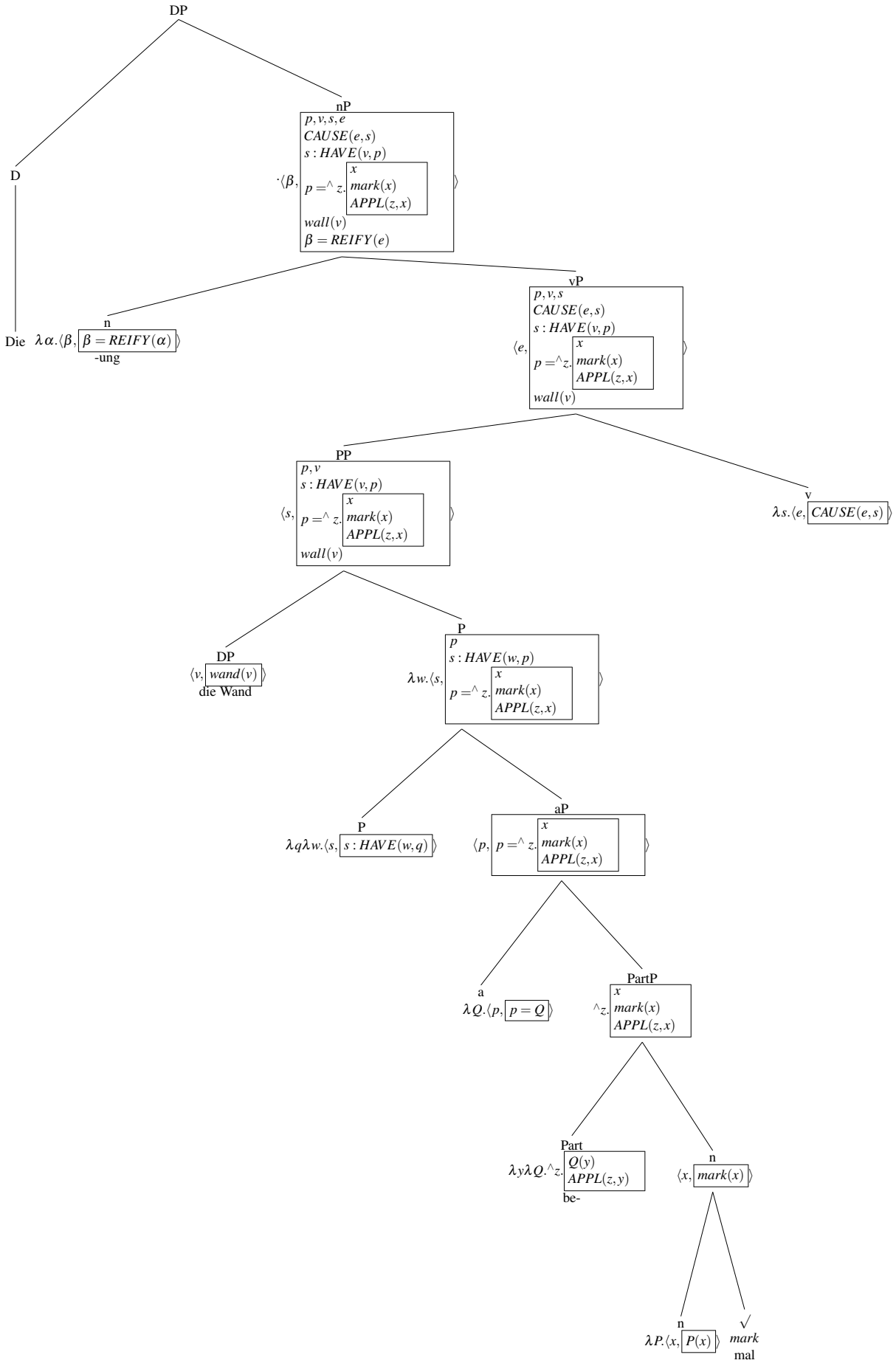
(17) object denotation



(18) target state denotation



(19) event denotation



8 Outlook

- The derivational correlation of sentences and their nominalizations suggests to take into account further ways of saying the same thing with nominals and sentences, e.g. facts (as suggested by a reviewer), imperatives, threats, interrogatives,...
- Consider nominalizations as a window into predication: the nominalization analysis in this paper has repercussions on the analysis of the underlying expressions, e.g. that adjectival participles are not derived from verbs but from underlying adjectival structures.
- Application of Ockham's razor and explain the typology of (result, target, resultant,individual, stage, ...) states in terms of how states are derived from properties. This would also help in explaining why the target state denotation and the object denotation in nominalizations are not easy to separate from each other (see 3e).
- Replace the idea of a fixed language independent natural language metaphysics with judgements at the sentence level and consequent transfer to word-syntax; this seems in particular relevant to transfer the kind of ontological claims that are traditionally justified with nominalizations (cp. e.g. reification of events with nominalizations Davidson [1967]) from the lexicon to the syntax.

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A Syntax-Semantics Interface

A.1 Syntax

- In pervasive or constructivist syntax approaches such as Distributed Morphology (overview: Harley and Noyer [1999]), Nanosyntax (overview: Starke [2009]) or Exoskeletal Syntax (Borer [2005, 2013]), the same syntactic principles are assumed to be at work below and above the 'word level'.
- Words are formed from 'roots', atomic, non-decomposable and category-neutral elements associated with encyclopedic knowledge
- Roots combine with features to build larger linguistic elements according to the same syntactic and semantic principles which are at work above the word level
- The syntactic structures we employ are not ad-hoc but follow the prinicples of minimalist syntax of phrase structure + move and merge (e.g. Chomsky [1995], Adger [2003]), incorporation is governed by the head movement constraint (Travis [1984]).
- Syntactic structures are motivated by syntactic and semantic acceptability diagnostics (e.g. modification or phrase completion/diminishment)
- Functional heads in the syntax are responsible for the introduction and modification of argument slots according to minimalist approaches to argument structure (creation of argument slots in the syntax, Hale and Keyser [1993]) and parallelism across N/V/P domains (Alexiadou [2001], Harley [2011], Svenonius [2003])
- For the semantic interpretation of syntactic structure, we use Discourse Representation Theory (Kamp et al. [2011]) where composition of DRSs is governed by applying λ-conversion and consequent DRS merge at each node of the syntactic structure.
- We distinguish existentialized discourse referents (occuring in the top of a box, the discourse universe) and variables for discourse referents (introduced in the 'variable store' of a representation indicated by brackets $\langle\rangle$) and discourse referents that are placeholders for argument slots resp. predicates (introduced as λ-bound discourse referents)
- *lambda*-conversion proceeds on discourse variables from left to right.

A.2 The Building Blocks of Meaning

The syntax-semantics interface is complemented with two general principles for the introduction of conditions on discourse referents

- The first function of functional heads is what we call the *conceptualization principle*
- Functional heads in the syntax are responsible for the introduction and predication of a particular sort of discourse referents ("ontological building blocks")
  - *v* introduces events: *e*
  - *a* introduces properties: *p*
  - *n* introduces objects: *x*

- *P* introduces states: *s*
- Discourse referents are introduced by establishing a conceptual relation (i.e. a light verb predication) between the introduced discourse referents and the complement XP of the functional head which introduces the discourse referent.
- The term *conceptualization* refers to the application of one of the following predication conditions:
  - *vP* + state-denoting $PP \rightarrow CAUSE(e,s)$
  - *PP* + property-denoting $aP \rightarrow s : HAVE(x,p)$
  - *PartP* + object-denoting $nP \rightarrow {}^{\wedge}z.$ APPL(x,z)
- From the viewpoint of formal semantics, the function of conceptualization is to existentialize that discourse referent in relation to which a new discourse referent is introduced.

- The second function of functional heads is the realization of what I call the *identification principle*
- From Kratzer [1996]'s work on exernal arguments, it is well known that semantic composition needs a composition prinicple with which thematic conditions imposed on a particular argument slot can be chained together (Kratzer [1996]'s event identification principle)

(20) Kratzer's example for Agent introduction
$\lambda x \lambda e.AGENT(e,x) + \lambda e.feed(the-dog,e) \rightarrow \lambda x \lambda e.AGENT(x,e) \wedge feed(the-dog,e)$

- In the present framework, Kratzer's identification principle is used in a more general way:
  - It applies to the identification of any sort of discourse referent, not just events
  - The thematic conditions imposed on a relation between the newly introduced discourse referent and the identified discourse referent are not limited to the Agenthood condition

B Stem alternation with *ver-/er-*

A question that was raised by a reviewer is how the approach proposed deals with stem alternations in causative/anticausative constructions.

(21) a. Hans versenkt/*versinkt das Schiff.
b. Das Schiff versinkt/*versenkt.
c. Hans verschwendet/*verschwindet das Geld
d. Das Geld verschwindet/*verschwendet.
e. Hans ertränkt/*ertrinkt die Katze.
f. Die Katze ertrinkt/*ertränkt.

Alexiadou et al. [2014] assume that the alternating verbs are both bi-eventive and that the stem alternation is to be explained with the presence resp. absence of Voice. However, only the inflected versions of the verbs have *-ung* nominalizations and thus, according to Roßdeutscher [2010]), are bi-eventive.

(22) a. verschwinden - *Verschwindung
b. verschwenden - Verschwendung
c. ertrinken - *Ertrinkung
d. ertränken - Ertränkung
e. versinken - *Versinkung
f. versenken - Versenkung

Notice that the stem alternation and the causative/anticausative alternation is independent of the *ver-*, as a comparison of the base verbs shows:

(23) a. schwinden - schwenden (Grimm Wörterbuch: "schwenden = schwinden machen, causativbildung zu schwinden", and there was also an *-ung* nominalization *Schwendung*, but see Demske [2002].)
b. trinken - tränken (*Trinkung - Tränkung)
c. sinken - senken (*Sinkung - Senkung)

Instead of a resultative meaning, *ver-* has the effect of disappearance/defocusing a figure, *er-*has a resultative meaning but also an inchoative meaning (see Dewell [2015].
Consequently, I'd propose that the stem alternation reflects mono-/bi-eventivity of the base verb but is not related to Voice nor does the prefixation has to do with it.