When a deverbal noun is really derived from a verb: Insights from zero-nouns

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Semantic criteria for lexical categories: Vs vs. Ns

- "Lexical categories express what can loosely be called semantic content, whereas functional categories [...] express semantic operators or can even be semantically empty" [Baker & Croft 2017]
- Conceptual definitions of nouns as referring to entities/things and verbs referring to events/actions are challenged by lexical action nouns (cf. Huyghe et al 2017):
  (1) The event/trip/incident occurred/happened/took place at midnight.
- Distribution is crucial: Hopper & Thompson (1985): “linguistic forms actually lack categoriality unless it is forced on them by their discourse functions”
- Von Fintel & Matthewson (2008): there is no core semantics in lexical categories!
Distributional characterization of Vs and Ns

• Relational nature of verbs (vs. nouns): Baker (2003): Vs take a specifier vs. Ns bear a referential index (see [+V]/[+N] in Chomsky 1970; Grimm & McNally 2013)

• Grimshaw (1990): argument structure (AS) indicates internal verbal properties in deverbical nominals: mixed categories in ASNs in (2a) vs. SENs/RNs in (2b)/(2c):

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

• Syntactic accounts of ASNs vs. SENs/RNs (DM, XSM): vP-structure in ASNs:

  (3) a. \([nP \ -ation \ [VEXAMIN]]\) (simple nominal structure: RN/SEN)
  b. \([nP \ -ation \ (Ext-vP) \ [vP \ v \ [VEXAMIN]]]\) (mixed N-V structure: ASN)
Deverbal zero-derived nouns (ZNs)

• In the absence of a nominalizer, ZNs are analyzed as root-derived simple nouns:
  (4) a. \([\text{DP} [\text{C=N} \text{ VWALK}]] \) vs. \([\text{TP} [\text{C=V} \text{ VWALK}]] \) (XSM, Borer 2013)
  b. \([\text{nP} \emptyset \text{ [VWALK]} ] \) or \([\text{nP} \emptyset \text{ [vP} \emptyset \text{ [VWALK]} ] ] \) (DM-style)

• Borer predicts no mixed categories in ZNs (no zero suffixes & no lexical categories)

• How can we tell if a ZN may include some vP structure or not?
• Distributional evidence (i.e., argument realization with genitives) is multiply ambiguous in nominals (see the instructor’s in (2))
• A complementary semantic criterion would be welcome!
Contribution of this talk

• Combine semantic insights on the verbal lexical category with distributional evidence from argument realization to test mixed categories in ZNs

• Koontz-Garboden et al (2019): cross-linguistically, state roots use the verb category to lexicalize change of state semantics: e.g., red – to redd<em>en</em>

➢ To the extent that such ZNs encode change of state meaning, they should include a <em>vP</em> (or more) and, implicitly, realize argument structure

➢ Compare ZNs based on two types of state roots: Beavers & Koontz-Garboden’s result roots (e.g., <em>burn</em>) and psychological property concept roots (e.g., <em>anger</em>)

➢ Although both roots lexicalize verbs and nouns, only result roots yield ZNs with internal verbal structure (i.e., derived from a <em>vP</em>)
Road map

1. Previous insights on zero-derived nominals
2. Change of state semantics lexicalized by verbs
3. ZNs built on result roots
4. ZNs built on psych property concepts
5. Conclusions
Zero-derived nominals: Levin & Rappaport Hovav (2013)

• ZNs are assumed to be entirely faithful to the root they are built on

• Levin (1993), Levin & Rappaport Hovav (2013) use the interpretation of ZNs to determine whether the verb is derived from a manner or result root:
  • Manner Vs describe events: run, walk, play, wipe, sweep
  • Result Vs encode result states, besides events: break, destroy, clean

• e.g., touch, hit, wipe, kick build event ZNs => manner verbs/roots
  break, cut, crack, split build result ZNs => result verbs/roots

➢ This observation is compatible with a root-derived analysis of ZNs, in the absence of any verbal structure
Zero-derived nominals: Borer (2013)

• ZNs do not realize argument structure (vs. suffixed ASNs; Grimshaw 1990):

  (5) a. the \textit{importation}/*\textit{import of goods} from China in order to bypass regulations

  b. the \textit{salutation/saluting}/*\textit{salute of the officers by the subordinates}

• ZNs cannot be derived from verbs with overt suffixes:

  (6) to acid-\textit{ify} — *the acid-\textit{ify}-\emptyset_N

  to crystal(l)-\textit{ize} — *the crystal(l)-\textit{ize}-\emptyset_N

➢ ZNs are root-derived and include no verbal structure

\[
\begin{array}{c}
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\text{n} \\
\emptyset \\
\text{vP} \\
\text{v} \\
\text{-ify/-ize} \\
\text{\sqrt{ACID}} \\
\text{\sqrt{CRYSTAL}}
\end{array}
\]
Some challenges

• Some ZNs allow argument structure (Newmeyer 2009; Harley 2009; Lieber 2016):
  (7)  a. the frequent arrest of Iowa college football players
       b. Sir Edmund Hillary’s climb of Mount Everest

• Natural text corpora exhibit many counterexamples to Borer’s data:
  (8)  a. Tokyo allowed the continued import of South African coal (COCA)
       b. Beijing's continuing export of dangerous missiles and nuclear technology
       c. Trump defended his salute of one of Kim's generals. (NOW)

➢ A simple root-based analysis cannot be the full answer for ZNs!
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Two types of state roots for COS verbs

• Beavers & Koontz-Garboden (BKG to appear): change of state (COS) verbs are built on two types of roots (Dixon 1982):

  • **Property concepts ~ adjectives** in English (=> Levin’s 1993 deadjectival COS verbs)
    • Dimension: large (big), small, short, long, deep, wide, tall
    • Color: white, black, red, green, blue, brown
    • Physical Property: cool, cold, warm, hot, dirty, dry, wet
    • Human Propensity: angry, calm, scare, sick, sad (depress), hurt, tire, embarrass

  • **Result roots ~ verbs** in English (=> non-deadjectival COS verbs)
    • Entity-specific COS: burn, melt, freeze, decay (rot), swell, grow, bloom, ferment
    • Breaking Verbs: break, crack, crush, shatter, split, tear (rip), snap
    • Verbs of Killing: dead/die/kill, murder, drown
    • Verbs of Calibratable COS: rise, ascend, increase, fall, drop, descend, decrease, decline
COS is lexicalized by verbs

• Koontz-Garboden et al (2019): lexicalization of property concepts in 88 languages:

• When polysemy is available, verbal lexemes can be polysemous with change of state senses; adjectival and nominal property concept lexemes cannot:
  • E.g., open\textsubscript{A/V}, calm\textsubscript{A/N/V} (state & COS) vs. red\textsubscript{A/N/*V} (state)/redden (COS)

➢ Generalization: The same property concept word can give rise to state and change of state lexical entailments just in case it is a verb.

➢ A semantic test for ZNs based on result roots vs. property concepts in English
Two types of state roots for COS verbs

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COS meaning with ZNs

• Following KG et al (2019), COS meaning with property concepts requires verbal lexicalization => corresponding ZNs should include at least a vP

(9) \[ [n_P \ O \ [\sqrt{R O O T} ] ] \] (10) \[ [n_P \ O \ [v_P \ O \ [\sqrt{R O O T} ] ] ] \]

• Psych ZNs ≈ “human propensity” property concepts (angry, calm, hurt, embarrass) most likely lack COS meaning and should be simple root-based nouns => (9)
  • Although they are verb-related, they do not involve a verb (cf. calm – hurt)

• ZNs built on result roots may encode COS meaning and have verb structure => (10)
  • Entity-specific COS (burn, melt, decay); Breaking Verbs (break, crack, crush, shatter); Verbs of Killing (kill, murder); Verbs of Calibratable COS (rise, increase, fall, drop)

➢ Test if such ZNs with COS readings may realize argument structure in confirmation of a verbal internal structure
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Empirical resources

• A database of 1,000+ ZNs that documents, among others:
  • Verb classes from VerbNet (Kipper Schuler 2005 – extension of Levin’s 1993)
  • OED senses categorized in 4 classes: Event, (Result) State, Result entity/Product, Agent/Instrument/Cause

• Data attested in corpora at www.english-corpora.org:
  • COCA: Corpus of Contemporary American English
  • GloWbE: Corpus of Global Web-Based English
  • NOW: News on the Web

• Search for argument realization (possessive, of-genitive, by-phrases) and additional event modifiers to confirm event structure (cf. Iordachioaia to appear)
ZNs built on result roots: Breaking, bending & cooking Vs

• These Vs yield result entity ZNs, as predicted by Levin & Rappaport Hovav (2013): e.g., break, crack, crush, shatter, rip, split, tear; bend, fold, crinkle, crumple, stretch; bake, fry, roast, steam, boil, broil, stew, scald, toast

• Event-like ZNs appear with light verbs (see break, split, rip, bend, fold, boil, bake), have no event structure of their own (*the break of the window)

• Only crash and roast realize argument structure:

  (11) a. [...] will ultimately lead to a complete crash of the US economy (GloWbE)
      b. the deliberate crash of a Germanwings passenger jet into a mountainside
      c. the sun resumed its slow roast of the forest canopy (COCA)
ZNs built on result roots: Entity-specific COS

- **Result entity** readings: *burn, melt, rot, swell, bloom, blossom, sprout, tarnish*
- Most have event readings but it is unclear whether they all show argument & event structure; some display internal arguments:

(12)a. Coast Guard begins controlled *burn of oil* in Gulf. (NOW)
   b. if we don't stop [...] the continued *melt* of sea ice, that population will disappear (NOW)
   c. a continuing, slow *thaw of a credit card lending industry* (GloWbE)
   d. a continued *decay of British society*; the ongoing *decay of culture* (GloWbE)
   e. describing the continued slow *rot of self-interested politicians* (GloWbE)
ZNs built on result roots: Calibratable COS

• Only a few result entity ZNs: rise, raise, vary, increase
• Most have event readings and realize argument structure:

(13) a. satellites have tracked the gradual rise of the world's ocean (GloWbE)
   b. the surgery will also stop the constant increase of pain (GloWbE)
   c. It is the result of the continued fall of the dollar. (GloWbE)
   d. the continuous drop of the budget deficit (NOW)
   e. 4 reported only a gradual decrease of benefit with longer delay (GloWbE)
   f. the biggest focus of the military in recent years has been a continuous raise of salaries (GloWbE)
ZNs built on result roots: Verbs of killing

- **All show event readings** and realize argument structure:

  (14) a. [he] probably witnessed *their murder of his mother* (NOW)
  
b. *their dispatch of Osama bin Laden* last May (NOW)
  
c. *the Uzbek army's massacre of civilians* in Andija (NOW)
  
d. *the slaughter of the city's Jews by crusaders* (NOW)
  
e. legalizing the on-site *kill of meat animals* on farms (GloWbE)
  
f. *Jaret Babych's rubout of Patrick McGillis* sent the Viper captain to the hospital for x-rays (NOW)
ZNs built on result roots: Summary

• Some ZNs derived from COS verbs (which lexicalize result roots) may inherit a COS meaning and also realize argument structure, as predicted by the hypothesis that COS meaning requires verbal lexicalization.

• Some subclasses (entity-specific, calibratable COS, Vs of killing) are more productive than others (breaking, bending, cooking Vs).
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Psych ZNs: *amuse*-Vs

- *Amuse*-Vs may be causative and possibly involve a change of state (Grimshaw 1990, Pesetsky 1995, Sichel 2010, Alexiadou et al 2013, Alexiadou & Iordâchioaia 2014):

  (15) a. The enemy *destroyed* the city.  (The city got destroyed.)
  
  b. The movie *amused* the children. (The children got amused.)

➢ Do their ZNs encode change of state and realize argument structure?
Psych ZNs derived from *amuse*-Vs

- Mostly **state ZNs**: anger, baffle, concern, content, daze, delight, discomfit, disgrace, disgust, disquiet, dismay, fluster, lull, muddle, puzzle, rankle, sting, trouble, worry
- Many **stimulus/cause ZNs**: affront, bother, charm, concern, delight, haunt, lull, puzzle, rankle, shock, surprise, torment, wound
- Most event ZNs are not psych: dazzle, disarm, exhaust, refresh, ruffle, transport
- **Only a few** ZNs receive psych **event-like** readings: shock, surprise, stun, torment
Psych ZNs with argument realization

- *Shock, surprise, and torment* can be found with arguments (Iordachioaia to appear):

  (16) a. Larry Fisher's shock at her accusation could have resulted from [...] (COCA)
  b. Whether it was my foreign accent or Belle’s surprise at my information
  c. Britain’s torment over EU membership is rooted in history (NOW)
  d. He redoubled his torment of the poor animal (COCA)

Do these encode change of state and verb structure?
Change of state in psych ZNs?

• To exhibit COS, these ZNs should be eventive; but only *torment* can be eventive:

(17) a. *Amanda’s shock at the news* [persisted for half an hour/*happened in the garden].
   b. *Olivia’s surprise at the present* [?persisted for a while/*happened in the kitchen].
   c. *Sam’s torment over the loss of his wife* [persisted for years/*happened 2y ago].
   d. *The murderer’s torment of his victim* [??persisted for hours/?happened at noon].

➢ Psych ZNs do not show eventive/COS readings with argument structure

➢ Semantic arguments of psych ZNs have root-specific prepositions, which indicates that they are not structural (Pesetsky 1995): cf. (17c) – (17d)
Argument realization with psych nouns

- Argument realization in psych ZNs does not originate in verbal structure.
- **Experiencers** and **stimuli** are realized with comparable PPs in non-causative *admire*-ZNs, but also deadjectival psych nouns or **lexical psych nouns**, which have no verbal structure:

  (18)a. Ann’s love for/of her sister
  b. Sam’s sadness at the news
  c. the boy’s passion for soccer
  d. my horror/joy at the news
COS readings in psych nouns

• Some psych ZNs exceptionally acquire COS meaning: e.g., *torment in (17d):
  *The murderer’s torment of his victim [??persisted for hours/?happened at noon].


  (19) a. The clown/*the movie (deliberately) amused/humiliated the audience.
    b. the clown’s/*the movie’s amusement/humiliation of the audience

  (20) a. The doctor/the situation (*deliberately) amazed/depressed the patients.
    b. *the doctor’s/the situation’s amazement/depression of the patients
COS meaning and argument structure with psych nouns

• Not all agentive psych Vs exhibit COS psych nouns with argument structure
• Cf. torment in (17d) and agentive annoy/anger (Grafmiller 2013, Alexiadou et al. 2019):

(20) a. John intentionally annoyed/angered his friend.
   b. *John’s annoyance/anger of his friend

(21) a. *Our constant annoyance of Mary got on our nerves. (Pesetsky 1995: 74)
   b. the residents' annoyance at the kids/with noise (state reading)
Psych ZNs: Summary

• Psych ZNs do not typically exhibit COS readings or argument structure (see Iordachioaia 2019 on both suffix-based and zero nominals)

• Only a few ZNs derived from agentive psych Vs show coerced COS readings and argument structure: *amusement/torment* do, but *annoyance/anger* do not.

➢ This behavior indirectly supports the hypothesis that COS meaning in ZNs requires verbal structure, which also allows argument realization

➢ (i.e., psych ZNs do not show COS meaning and do not inherit verbal argument structure)
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Conclusions

• The behavior of ZNs is more dynamic than predicted by Borer’s root-based formation (i.e., root categorization; see Iordachioaia to appear on this aspect)

• ZNs may display COS readings and realize argument structure, depending on the verb classes they are derived from: result roots vs. psych property concepts

• The correlation between COS meaning and argument realization presents a case where identifying the lexical category of a verb (i.e., its functional structure) combines both semantic and distributional evidence

• Argument realization in COS ZNs supports Koontz-Garboden et al’s hypothesis that COS meaning requires verbal lexicalization

• **Further question**: Why are some result verb subclasses more likely to yield COS meaning ZNs than others?
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References

References

ZNs built on COS and *amuse* verbs: Overview

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