

# Modeling the interaction of affix semantics and base semantics

A frame-based approach

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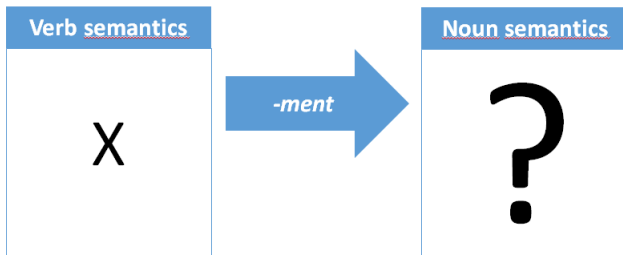
# The problem: Polysemy

1. RESULTS (the outcome of VERB-ing): *acceptance, alteration*
2. PRODUCTS (the thing that is created by VERB-ing): *pavement, growth*
3. INSTRUMENTS (the thing that VERB-s): *seasoning, advertisement*
4. LOCATIONS (the place of VERB-ing): *dump, residence*
5. AGENTS (people or person who VERB-s): *administration, cook*
6. MEASURE TERMS (how much is VERB-ed): *pinch, deceleration*
7. PATHS (the direction of VERB-ing): *decline, direction*
8. PATIENTS (the thing affected or moved by VERB-ing): *catch, acquisition*
9. STATES (the state of VERB-ing or being VERB-ed): *alienation, disappointment*
10. INSTANCES (an instance of VERB-ing): *belch, cuddle*

# How do we get different readings?

- Certain base verbs evoke certain readings (BLP, 212)
  - Verb requires instrument – Instrument nominalization
  - *to wrap* – *wrap*; *to refresh* – *refreshment*
- Shift to a syntactic argument of the verb  
*John purchased a car. His wife approves of this purchase.*
- Shifts are not restricted to syntactic arguments  
*My granny used to embroider pillowcases. I love the embroidery on this one.*

# An interplay of verb and suffix



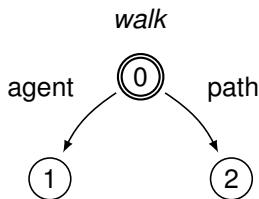
# This paper

- Introduce a new approach to the formalization of the interpretation of derived words
- Apply this approach to the analysis of *-ment* derivatives
- Discuss the implications of such an approach for other derivational processes

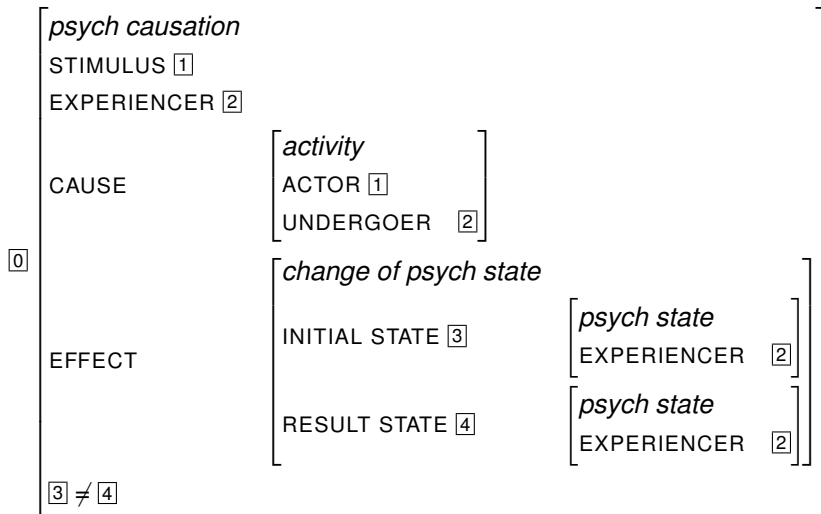
# Frames

Barsalou (1992a,b), Löbner (2013)

- Frames are recursive attribute-value structures
- They serve to model mental representations of concepts
- They are applicable to linguistic phenomena
- They can be depicted as graphs or matrices



# Frame semantics



## Methodology: *-ment*

- Many (often highly lexicalized) derivatives
  - government 1484
  - development 1756
  - department c. 1450
- Nowadays still somewhat productive (BLP, 199)
- Aim: synchronic analysis of the productive process
- Neologisms (1900-today)



# Data

- Neologisms (*Oxford English Dictionary*)
- Hapax Legomena (*Corpus of Contemporary American English*)
- 86 *-ment* derivatives from 24 verb classes (Levin 1993)
- Largest class: psych verbs (N=16)
- Attestations from other corpora (GloWbE, WebCorp, Google)

# Semantic coding of derivatives

Traditional semantic categories, e.g.

- STATE
- EVENT
- EXPERIENCER
- STIMULUS
- RESULT STATE

# Examples

- EVENT  
Medicine's and my great problem and great fault consist of what might be called the intellectualization – the **enrapturement** with science and technology – by which that legion of men and women who are today's doctors have allowed themselves to become besotted. (Webcorp\_BLOG\_1998)
- RESULT STATE  
I know a lot of our compatriots also feel the same angst, consternation and **confoundment**. (GloWbE\_ART\_2012)
- STIMULUS  
Here comes a **confoundment**(new word I just made up :) ) for you. (Google COMM 2006)

# PSYCH verbs (AMUSE verbs): Types in our dataset (N=16)

affrightment

bemusement

bumfuzzlement

dumbfoundment

enragement

nonplusment

soothement

upsetment

annoyment

upliftment

confoundment

endullment

enrapturement

perturbment

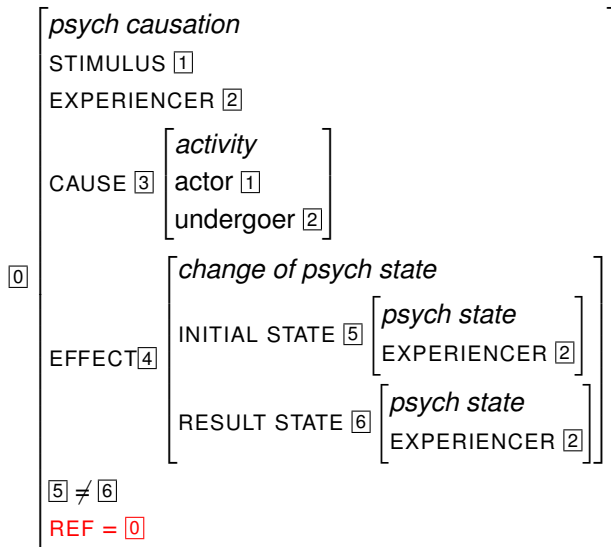
staggerment

worrimment

# Results

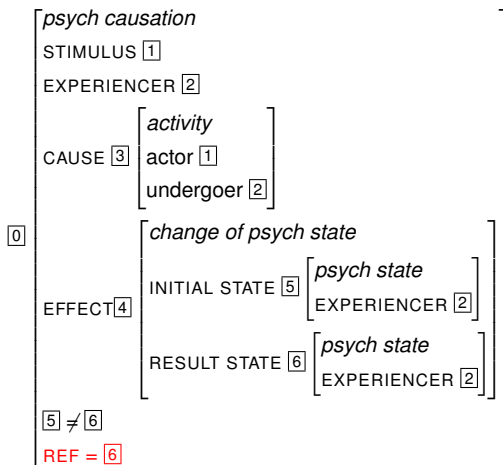
- result state is dominant: not surprising
- stimulus or event nominalizations should be impossible (Pesetsky 1995, 71):  
"These nominalizations lack causative force"  
"*Amusement* does not refer to something amusing something, but to the state of being amused"
- Not true.

# Formalization: PSYCH verbs

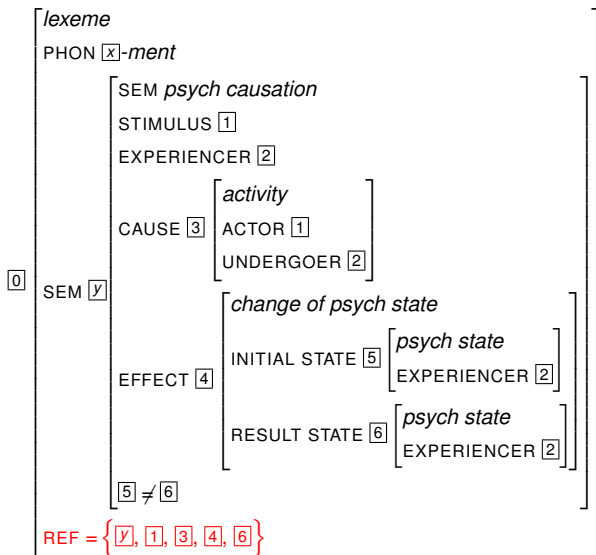


# Formalization: RESULT STATE

*confoundment* 'state of being confounded'



# Formalization: *-ment* on PSYCH verbs





## Polysemy triggered by *-ment*

- Possible referential shifts with PSYCH verbs: EVENT, STIMULUS, RESULT STATE
- Impossible shift: experiencer
- General constraint: \*animate
- What about other verb classes as bases?

# CHANGE-OF-STATE base verbs: Examples

## 1. EVENT

Markham sets down the rules about park **befoulment**. (WebCorp BLOG 2012)

## 2. INSTRUMENT

Minimal bleeding and I didn't have to have any guaze/tissue in my mouth at all to try and stop it? I'm thinking that they must have used a **congealment** or something to make it clot while I was under or something? (GloWbE COMM 2010)

## 3. EVENT or CAUSE (*activity*)

Click here to watch my **progressment** of the website (Google COMM 2013)

## 4. EFFECT (*change of state*)

For one second she clung to her son, and then, disengaging herself, froze up like the sudden **congealment** of a spring.

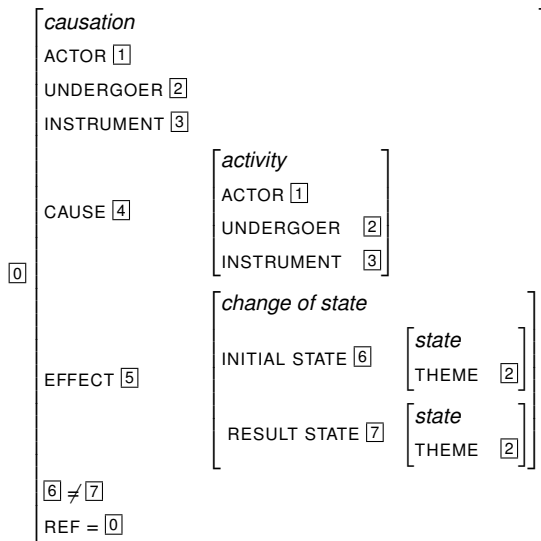
## 5. RESULT STATE

Sarcasm, Deb ... trying to excuse the **bedragglement** of the hair, etc?. (Google COMM 2013)

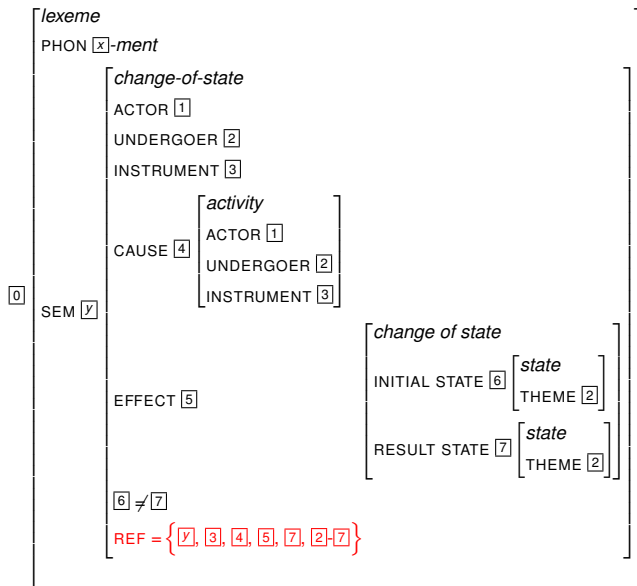
## 6. THEME (in RESULT STATE)

I set down the scrap of doll's dress, a **bedragglement** of loose lace hem (COCA FIC 1999)

# Formalization: Change-of-state verbs



# Formalization: *-ment* on CHANGE-OF-STATE verbs



# Another class of base verbs: ILLUSTRATE verbs, e.g. *address*

Different meanings:

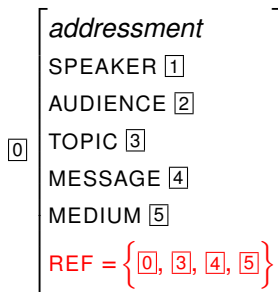
- 'A addressed B on topic C by saying D in his speech (using E as a medium).'
- 'put an address on something'
- 'dedicate one's attention to something'
- 'speak to someone using a name'

## *-ment on ILLUSTRATE verb address*

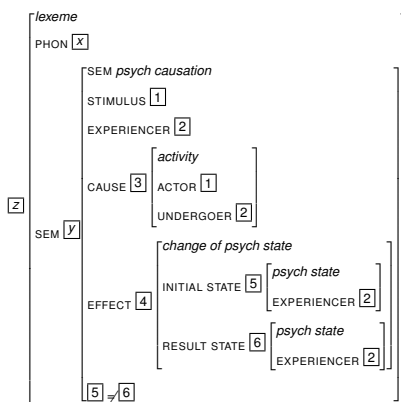
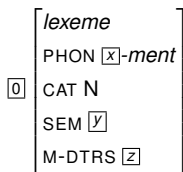
'A addressed B on topic C by saying D in his speech (using E as a medium).'

- EVENT  
I'd die of embarrassment before making any kind of **addressment** to a lone female in that way (WebCorp COMM 2014)
- TOPIC  
today when i checked ranking, many many keywords have lost rank. Some are not even found! [?] The next thing is this: If i submit my xml sitemap in webmasters central ..., does this make a difference in influencing rankings?? Any advice on these 2 **addressments** is very much appreciated! (Google COMM 2008)
- MESSAGE  
The final **addressment** was that Shilar or their mage consort did not aid Axfell in obtaining the Silver Golem. (Google COMM 2004)
- MEDIUM The **addressments** were still stuck to the wall

# Formalization: *-ment* on ILLUSTRATE verbs



# Formalizing *-ment* across verb classes





# Problem

- Where do the referential restrictions reside?
- $REF = \{y, 1, 3, 4, 6\}$

## *-ment*: Summary

- Frame-based approach can elegantly model (some parts of) the interaction of base and affix.
- Shifts can target argumental and non-argumental components of the semantic representation.
- Shifts cannot target animate elements in the semantic representation (but everything else?)
- Attested readings result from clearly defined shifts in the semantic structure of the respective base verbs.
- The differences between different (sub-)classes of verbs arise naturally from the differences in the verbal frames.

## Derivation = metonymic shift?

- The semantic relationships between stems, affixes, and derived words have been analyzed in terms of metonymy (Radden and Kövecses 1999, Barcelona 2002, Basílio 2009, Janda 2011)
- CONTAINED FOR CONTAINER
  1. *The milk tipped over.*
  2. *saxar-nica* ('sugar'-NOM) 'sugar-bowl' (Russian)
  3. *květin-áč* (lit. 'flower'-AGENT) 'flower-pot' (Czech)
- "Word-formation performs parallel CONTAINED FOR CONTAINER metonymies in the Russian and Czech examples, which are derived from *saxar* 'sugar' and *květina* 'flower, flowering plant' respectively". (Janda 2011: 361)

## Definition and formalization

"a source concept ... provides mental access to the target concept"  
(Janda 2011:360)

- source = concept of base
- context = affix
- target = concept of derived word
- **milk** FOR **thing containing milk**
- **CONTAINED** FOR **CONTAINER** METONYMY
- **sugar** FOR **thing containing sugar**
- **BASE** FOR **DERIVATIVE**

It is rather the affix that provides access to the derived concept.

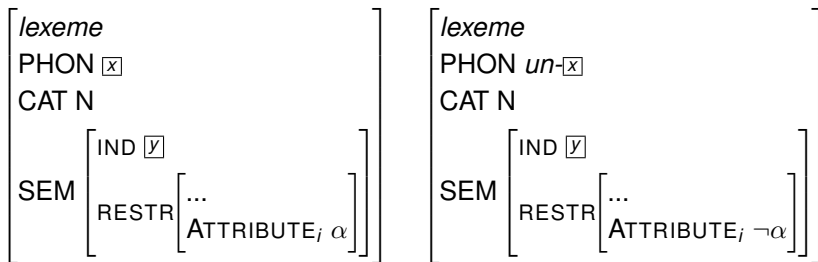
# Is all derivation metonymic?

- There are instances of derivation that cannot be explained by metonymy.
- Whenever meaning is added, and not shifted
- A case in point: prefixal negation
  - standard negatives ('not X', e.g. *dislike*)
  - privatives ('without X/remove X from', e.g. *decaffeinate*)
  - reversatives ('reverse action of X-ing', e.g. *unlock*)
  - pejoratives ('do X wrongly', e.g. *misassemble*)
  - scale external (irrelevance of the scale or polar opposition, e.g. *amelodic*)
  - stereotype negation (a non-stereotypical exemplar of its category, e.g. *non-person*)
  - contrary negation (terminal points on a gradable scale, e.g. *clear-unclear*)
  - contradictory negation (no intermediate states, e.g. *animate-inanimate*)

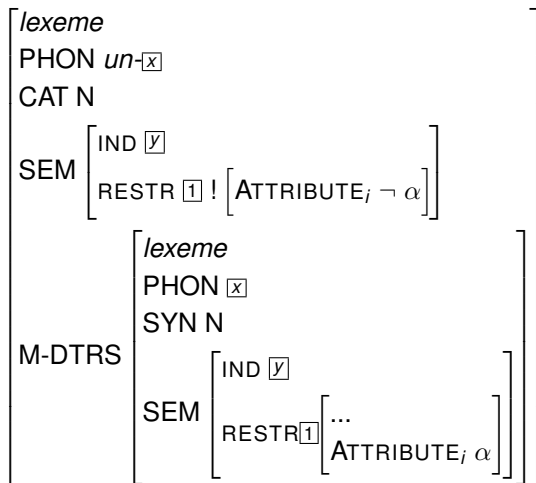
# Stereotype negation

*She calls her new way of eating the 'undiet' because it has no restrictions* (from COCA, Bauer et al. 2013: 373)

- un-* negates the value of an attribute of the base lexeme.

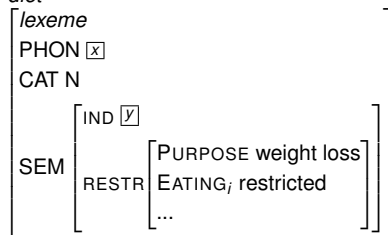


# Stereotype negation: Unified lexical rule for *un-*

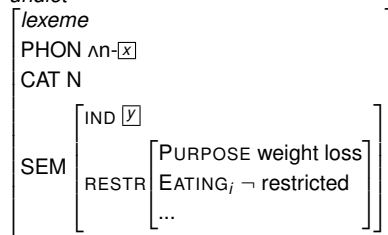


# *un-diet*

*diet*

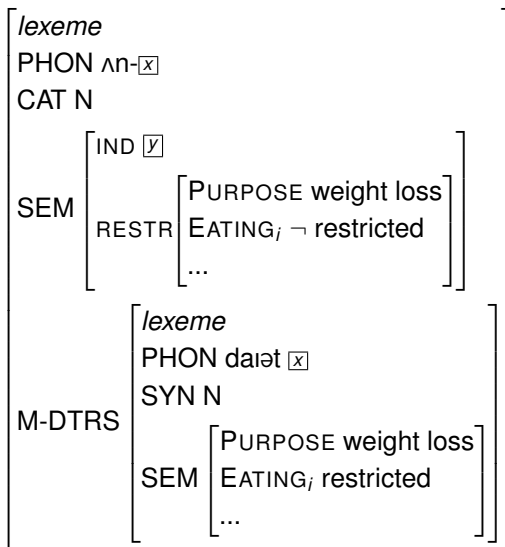


*undiet*





## Unified lexical entry for *undiet*



# Conclusion

## Problems with the metonymy approach to word formation

- Overgeneral notion of metonymy
- Metonymic expressions proper vs. metonymy in word-formation
- There are instances of word formation that cannot be explained by metonymy

## New approach: Frame-based formalization

- Unification and prediction?
- Constraints (e.g. never PURPOSE)?

Thank you very much for your attention!

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