Meaning in word-formation: The frame-semantic hypothesis

Marios Andreou, Lea Kawaletz, Ingo Plag

17th International Morphology Meeting, Vienna, February 2016
• Polysemy in word-formation is all-pervasive (e.g. Rainer 2015).
• "[W]e must be able to account for the substantial evidence that affixes [...] are frequently semantically underspecified, and subject to polysemy and meaning extensions of various sorts." (Bauer, Lieber & Plag 2013: 641)
• Which kinds of readings or meaning extensions are possible and which ones should be impossible for a given derivative?
Illustration: Nominalizations

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 (e.g. Bauer, Lieber & Plag 2013: 212, Ferret & Villoing 2015)
  - 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

Verb semantics

X

-ment

Noun semantics
This paper

- Introduce a new approach to the formalization of the interpretation of derived words
- Apply this approach to the analysis of *-ment* and *un*- derivatives
Barsalou (1992a,b), Löbner (2013)

- Frames are recursive attribute-value structures, organized in a type hierarchy. **check formulation!**
- They are a general format of mental representations of concepts
- They are applicable to linguistic phenomena
- They can be depicted as graphs or matrices

Frames
Frame semantics

\[
\begin{align*}
\text{psych causation} & : \text{STIMULUS} \ 1 \quad \text{EXPERIENCER} \ 2 \\
\text{CAUSE} & : \text{activity} \\
\text{EFFECT} & : \text{change of psych state} \\
\end{align*}
\]

\[
\begin{align*}
0 & \\
\text{INITIAL STATE} & : \text{psych state} \ 3 \\
\text{RESULT STATE} & : \text{psych state} \ 4 \\
\end{align*}
\]

\[
3 \neq 4
\]
Data

- Neologisms (*Oxford English Dictionary*)
- Hapax Legomena (*Corpus of Contemporary American English*)
- 109 *-ment* derivatives from 29 verb classes (Levin 1993)
- Largest class: psych verbs (N=23)
- 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)
• 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: -ment on PSYCH verbs

**lexeme**

PHON \[x\]-ment

SEM *psych causation*

STIMULUS [1]

EXPERIENCER [2]

CAUSE [3]

ORIGINATOR [1]

UNDERGOER [2]

activity

EFFECT [4]

change of *psych state*

INITIAL STATE [5]

RESULT STATE [6]

\[5 \neq 6\]

REF = \{\[y\], [1], [3], [4], [6]\}
Formalization: -ment on CHANGE-OF-STATE verbs

- **lexeme**
  - PHON \[x\]-ment

- **change-of-state**
  - ACTOR [1]
  - UNDERGOER [2]
  - INSTRUMENT [3]

- **cause**
  - ACTOR [4]
  - UNDERGOER [2]
  - INSTRUMENT [3]

- **activity**
  - ACTOR [1]
  - UNDERGOER [2]
  - INSTRUMENT [3]

- **change of psych state**
  - INITIAL STATE [6] [state] [THEME 2]
  - RESULT STATE [7] [state] [THEME 2]

- \[6 \neq 7\]

- **REF = \{ y, 3, 4, 5, 7, 2-7 \}**
Formalizing -ment across verb classes

- Attribute-Value structures, type hierarchy
- Lexical rules (Riehemann 1998, Koenig 1999, Bonami & Crysmann 2016, see also Booij 2010)
- Hierarchical lexicon, inheritance
add downward lines with some content, e.g. AGENT or something
• Attested readings of words of a given morphological category result from clearly defined shifts in the semantic structure of the respective bases.
• These shifts target core elements of the semantic representation of the base.
• For deverbal nominalizations, this means that the shifts can target argumental and non-argumental components.
• Bases of different semantic classes thus trigger different kinds of shifts in their derivatives.
• Given a particular verb class possible readings of the respective derivatives are predictable.
• Frame-based approach can be fruitfully employed to model derivational semantics.
• Stay tuned!
Thank you very much for your attention!

We gratefully acknowledge financial support by Deutsche Forschungsgemeinschaft (SFB 991, Project C 08)
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)