Same syntax, different semantics: A compositional approach to idiomaticity in multi-word expressions

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Introduction

Multi-word expressions (MWEs) with literal and idiomatic meanings:

(1) *John spilled the beans.*
literal meaning: 'John spilled the beans.'
idiomatic meaning: 'John revealed one or more secrets.'

$\boxed{\text{“decomposable”}}$

(2) *John kicked the bucket.*
literal meaning: 'John kicked the bucket.'
idiomatic meaning: 'John died.'

$\boxed{\text{“non-decomposable”}}$

Introduction

literal vs. idiomatic readings

- syntactic ambiguity
  non-compositional
- semantic ambiguity
  - lexicon-/disjunction-based
    compositional
  - inference-based
    non-compositional

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⇒ How to model them with precision grammars?

⇒ What sort of ambiguity should be preferred?

⇒ One approach for all types of MWEs?

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- ⇒ What sort of ambiguity should be preferred?
- ⇒ One approach for all types of MWEs?

target framework: LTAG + frame semantics

preceding this work: Lichte & Kallmeyer (2014; 2015)

Outline

1. Tree-Adjoining Grammar + frame semantics
2. Former work
   - Syntactic ambiguity approaches with TAG
   - Semantic ambiguity approaches
3. New: Semantic ambiguity approach with TAG
4. Summary

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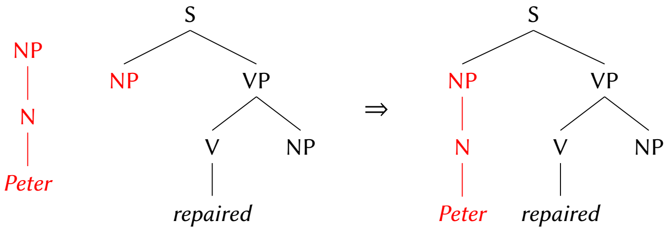
Tree-Adjoining Grammar (TAG)[2,16,17]

- A grammar consists of elementary trees.
- Elementary trees can be combined by two operations:
  - **substitution:** replace a non-terminal leaf with an initial tree



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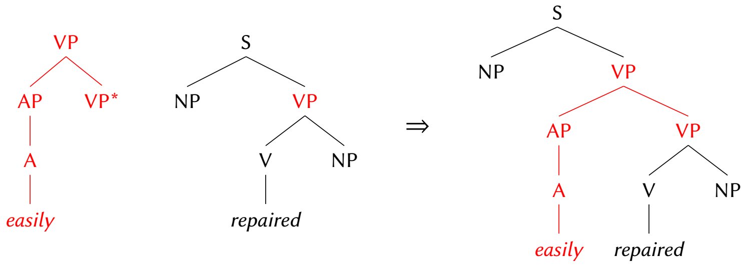

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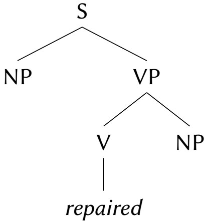
- Elementary trees cover an **extended domain of locality**.
  - The head immediately combines with its arguments.
  - no predetermined derivational order

  ⇒ constructionist framework![14]



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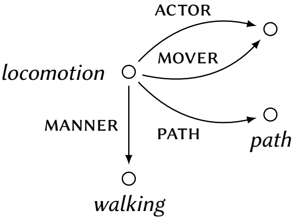
  $\Rightarrow$ constructionist framework![14]
- Lexical generalizations are expressed in the **metagrammar**.

Frame semantics

- Frames emerged as a representation format of lexical and conceptual knowledge.[6,12,22]



$$\begin{bmatrix} \textit{locomotion} & \\ \text{ACTOR} & \boxed{1} \\ \text{MOVER} & \boxed{1} \\ \text{PATH} & \textit{path} \\ \text{MANNER} & \textit{walking} \end{bmatrix}$$

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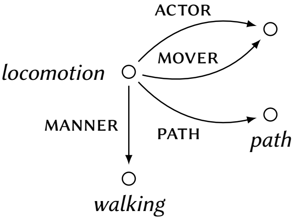

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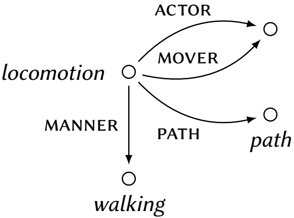

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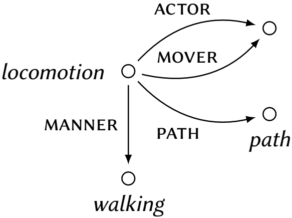

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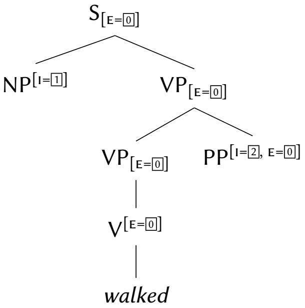
- Frame semantics with quantification: see Kallmeyer, Osswald, Pogodalla (this conference)

Kallmeyer & Osswald [18]:

- lexicon: **pairs of elementary trees and frames**



$$\boxed{0}\begin{bmatrix} \textit{bounded-locomotion} & \\ \text{ACTOR} & \boxed{1} \\ \text{MOVER} & \boxed{1} \\ \text{GOAL} & \boxed{2} \\ \text{PATH} & \textit{path} \\ \text{MANNER} & \textit{walking} \end{bmatrix}$$

- Elementary trees are enriched with **interface features**, which contain base labels from the frame representation.
  - unification of interface features $\rightsquigarrow$ unification of frames
- parallel composition of derived trees and larger frames

TAG + frame semantics: Example

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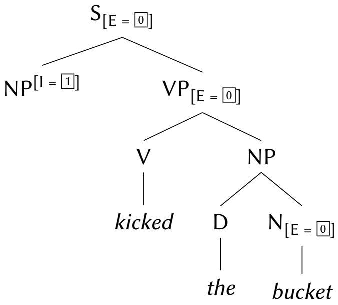
(idea from Abeillé & Schabes)[1,3,4]

Idiomaticity through multiple anchoring: Components of an MWE jointly anchor an elementary tree.

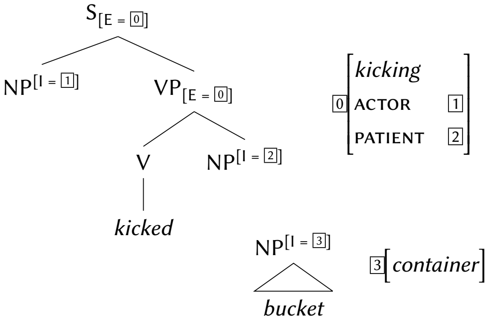


$$\boxed{0}\begin{bmatrix} \textit{dying} & \\ \text{PATIENT} & \boxed{1} \end{bmatrix}$$

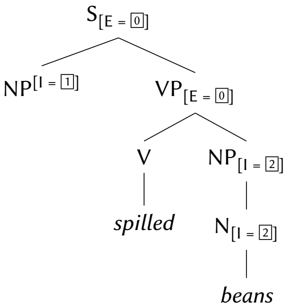
Syntactic ambiguity approaches with TAG

(idea from Abeillé & Schabes)[1,3,4]

The literal meaning is evoked by regular single-anchored elementary trees:



Example with “decomposable” *spill the beans*:



$$\boxed{0}\begin{bmatrix} \textit{divulging} & \\ \text{ACTOR} & \boxed{1} \\ \text{THEME} & \boxed{2}\begin{bmatrix}\textit{information}\end{bmatrix}\end{bmatrix}$$

idiomatic

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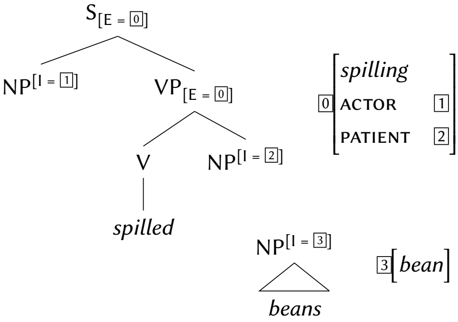

literal

Syntactic ambiguity approaches elsewhere

Syntactic ambiguity approach

There are different syntactic derivations/representations for literal and idiomatic meanings.

Also found in:[29]

- Transformational Grammar (Chomsky 1980)
- Lexical-functional Grammar (Bresnan 1982)
- Head-driven Phrase Structure Grammar (Sailer 2000)[30,33]
- Sign-based Construction Grammar (Kay & Sag To appear)

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But there are (general?) problems …

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  (4) *Eventually she spilled all the beans. But it took her a few days to spill them all.* (Riehemann)
  (5) *Pat pulled some strings for Chris. But Alex didn't have access to any strings.* (Manfred Sailer, pc)

Semantic ambiguity approaches

Semantic ambiguity approach

There is one syntactic derivation/representation for literal and idiomatic meanings.

⇒ There is no special lexical entry for MWEs;
kick and *spill* each have only one lexical entry.

semantic ambiguity

lexicon-/disjunction-based	inference-based
compositional	**non-compositional**

Lexicon-/disjunction-based: Gazdar et al. (1985)

Components of decomposable MWEs are assigned disjunctions over meaning constants (of intensional logic):

(6) a. *spill* $\rightsquigarrow$ spill′ ∨ spill-idiom′
beans $\rightsquigarrow$ beans′ ∨ beans-idiom′

b. spill-idiom′ (beans-idiom′): defined
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Also applicable to non-decomposable idioms (not in Gazdar et al. 1985):

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bucket $\rightsquigarrow$ bucket′ $\vee$ bucket-idiom′
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- unified syntax of literal and idiomatic readings

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The idiomatic meaning is deduced from the literal one by means of "quasi-inference". Hence MWE-components are equipped with their literal meaning only!

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- computationally very powerful: non-monotonic inference rules.

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⇒ How to combine those two?

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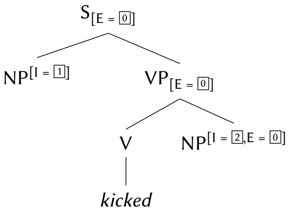
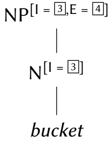
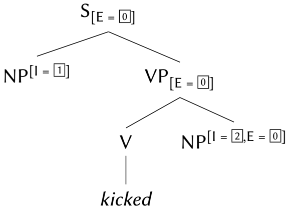


$$\boxed{0}\left[\begin{array}{ll}\text{FRAME} & \left[\begin{array}{ll}\textit{kicking} & \\ \text{ACTOR} & \boxed{1} \\ \text{PATIENT} & \boxed{2}\end{array}\right] \\ \text{MORPH} & \left[\begin{array}{ll}\text{LEMMA} & \text{kick}\end{array}\right]\end{array}\right] \vee \boxed{0}\left[\begin{array}{ll}\text{FRAME} & \boxed{7}\left[\begin{array}{ll}\textit{dying} & \\ \text{PATIENT} & \boxed{1}\end{array}\right] \\ \text{MORPH} & \left[\begin{array}{ll}\text{LEMMA} & \text{kick}\end{array}\right]\end{array}\right] \vee \ldots$$



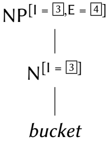
$$\boxed{3}\left[\begin{array}{ll}\text{FRAME} & \left[\textit{container}\right] \\ \text{MORPH} & \left[\begin{array}{ll}\text{LEMMA} & \text{bucket} \\ \text{NUM} & \text{sing}\end{array}\right]\end{array}\right] \vee \boxed{3}\left[\begin{array}{ll}\text{FRAME} & \boxed{6}\left[\textit{dying}\right] \\ \text{MORPH} & \left[\begin{array}{ll}\text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing}\end{array}\right]\end{array}\right] \vee \ldots$$

A lexicon-/disjunction-based approach with TAG

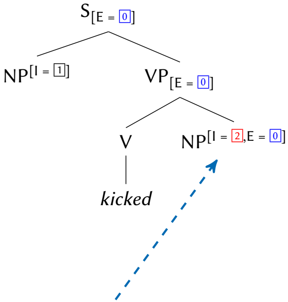


$$\boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{kicking} & \\ \text{ACTOR} & \boxed{1} \\ \text{PATIENT} & \boxed{2} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \vee \begin{matrix} \boxed{0}\begin{bmatrix} \text{FRAME} & \boxed{7}\begin{bmatrix} \textit{dying} & \\ \text{PATIENT} & \boxed{1} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \\ \boxed{2}\begin{bmatrix} \text{FRAME} & \boxed{7} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \end{matrix} \vee \ldots$$

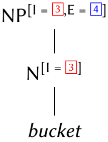
idiomatic mirroring



$$\boxed{3}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{container} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \vee \begin{matrix} \boxed{3}\begin{bmatrix} \text{FRAME} & \boxed{6}\begin{bmatrix} \textit{dying} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \\ \boxed{4}\begin{bmatrix} \text{FRAME} & \boxed{6} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \end{matrix} \vee \ldots$$

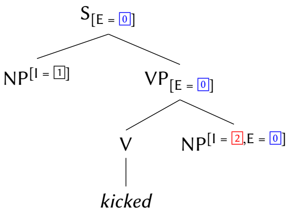


$$\boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{kicking} & \\ \text{ACTOR} & \boxed{1} \\ \text{PATIENT} & \boxed{2} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \vee \boxed{0}\begin{bmatrix} \text{FRAME} & \boxed{7}\begin{bmatrix} \textit{dying} & \\ \text{PATIENT} & \boxed{1} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \; \boxed{2}\begin{bmatrix} \text{FRAME} & \boxed{7} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \vee \ldots$$



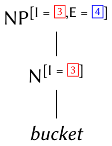
$$\boxed{3}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{container} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \vee \boxed{3}\begin{bmatrix} \text{FRAME} & \boxed{6}\begin{bmatrix} \textit{dying} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \; \boxed{4}\begin{bmatrix} \text{FRAME} & \boxed{6} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \vee \ldots$$

A lexicon-/disjunction-based approach with TAG

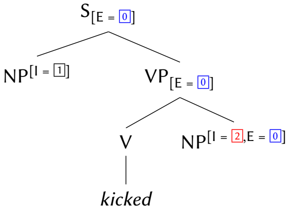


$$\boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{kicking} & \\ \text{ACTOR} & \boxed{1} \\ \text{PATIENT} & \boxed{2} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \vee \begin{array}{l} \boxed{0}\begin{bmatrix} \text{FRAME} & \boxed{7}\begin{bmatrix} \textit{dying} & \\ \text{PATIENT} & \boxed{1} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \\ \boxed{2}\begin{bmatrix} \text{FRAME} & \boxed{7} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \end{array} \vee \dots$$

kicked’(bucket’)

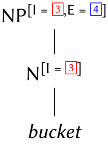


$$\boxed{3}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{container} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \vee \begin{array}{l} \boxed{3}\begin{bmatrix} \text{FRAME} & \boxed{6}\begin{bmatrix} \textit{dying} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \vee \dots \\ \boxed{4}\begin{bmatrix} \text{FRAME} & \boxed{6} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \end{array}$$

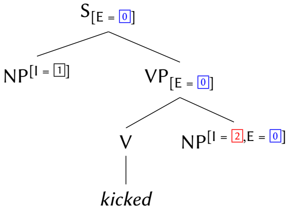


$$\boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{kicking} & \\ \text{ACTOR} & \boxed{1} \\ \text{PATIENT} & \boxed{2} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \vee \boxed{0}\begin{bmatrix} \text{FRAME} & \boxed{7}\begin{bmatrix} \textit{dying} & \\ \text{PATIENT} & \boxed{1} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \boxed{2}\begin{bmatrix} \text{FRAME} & \boxed{7} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \vee \ldots$$

kicked-idiom'(bucket-idiom')

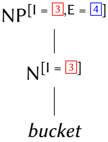


$$\boxed{3}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{container} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \vee \boxed{3}\begin{bmatrix} \text{FRAME} & \boxed{6}\begin{bmatrix} \textit{dying} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \boxed{4}\begin{bmatrix} \text{FRAME} & \boxed{6} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \vee \ldots$$



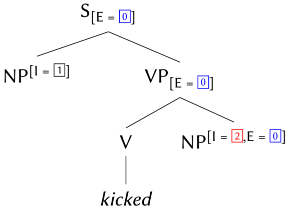
$$\boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{kicking} & \\ \text{ACTOR} & \boxed{1} \\ \text{PATIENT} & \boxed{2} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \vee \begin{array}{l} \boxed{0}\begin{bmatrix} \text{FRAME} & \boxed{7}\begin{bmatrix} \textit{dying} & \\ \text{PATIENT} & \boxed{1} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \\ \boxed{2}\begin{bmatrix} \text{FRAME} & \boxed{7} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \end{array} \vee \ldots$$

kicked-idiom'(bucket') ⚡



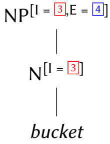
$$\boxed{3}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{container} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \vee \begin{array}{l} \boxed{3}\begin{bmatrix} \text{FRAME} & \boxed{6}\begin{bmatrix} \textit{dying} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing} \end{bmatrix} \end{bmatrix} \vee \ldots \\ \boxed{4}\begin{bmatrix} \text{FRAME} & \boxed{6} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{kick} \end{bmatrix} \end{bmatrix} \end{array}$$

A lexicon-/disjunction-based approach with TAG



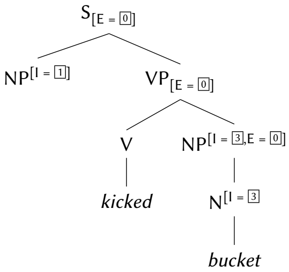
$$\boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{kicking} & \\ \text{ACTOR} & \boxed{1} \\ \text{PATIENT} & \boxed{2}\end{bmatrix} \\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \text{kick}\end{bmatrix}\end{bmatrix} \vee \begin{array}{l} \boxed{0}\begin{bmatrix} \text{FRAME} & \boxed{7}\begin{bmatrix}\textit{dying} & \\ \text{PATIENT} & \boxed{1}\end{bmatrix} \\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \text{kick}\end{bmatrix}\end{bmatrix} \\ \boxed{2}\begin{bmatrix} \text{FRAME} & \boxed{7} \\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing}\end{bmatrix}\end{bmatrix} \vee \ldots \end{array}$$

kicked'(bucket-idiom')



$$\boxed{3}\begin{bmatrix} \text{FRAME} & \begin{bmatrix}\textit{container}\end{bmatrix} \\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \text{bucket} \\ \text{NUM} & \text{sing}\end{bmatrix}\end{bmatrix} \vee \begin{array}{l} \boxed{3}\begin{bmatrix} \text{FRAME} & \boxed{6}\begin{bmatrix}\textit{dying}\end{bmatrix} \\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \text{bucket} \\ \text{DEF} & + \\ \text{NUM} & \text{sing}\end{bmatrix}\end{bmatrix} \vee \ldots \\ \boxed{4}\begin{bmatrix} \text{FRAME} & \boxed{6} \\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \text{kick}\end{bmatrix}\end{bmatrix} \end{array}$$

Result of combining *kicked* and *bucket*:



$$\boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{kicking} & \\ \text{ACTOR} & \boxed{1} \\ \text{PATIENT} & \boxed{3}\end{bmatrix} \\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \text{kick}\end{bmatrix}\end{bmatrix} \quad \boxed{3}\begin{bmatrix}\text{FRAME} & \begin{bmatrix}\textit{container}\end{bmatrix} \\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \text{bucket}\\ \text{NUM} & \text{sing}\end{bmatrix}\end{bmatrix} \vee \boxed{0}\begin{bmatrix}\text{FRAME} & \boxed{7}\begin{bmatrix}\textit{dying} & \\ \text{PATIENT} & \boxed{1}\end{bmatrix}\\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \text{kick}\end{bmatrix}\end{bmatrix} \quad \boxed{3}\begin{bmatrix}\text{FRAME} & \boxed{7} \\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \text{bucket}\\ \text{DEF} & + \\ \text{NUM} & \text{sing}\end{bmatrix}\end{bmatrix} \vee \ldots$$

Bargmann's challenge

Here is a challenge from Bargmann (2015):

(9) *The whole idea of the really talented/successful person in their 20s isn't a real thing. Or at the very least, it isn't an actual attainable thing. All those people have people behind them* ***pulling string after string*** *for them.*

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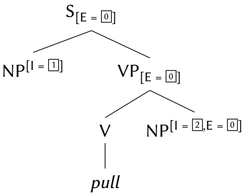
Working with HPSG, Bargmann proposes a "Semantic Representation approach":

- idiom constants pull'_{id} and $\text{string}'_{\text{id}}$ have to co-occur
- $\text{string}'_{\text{id}}$ is in the scope of a "non-specific plural quantifier" (Mel'čuk)

Bargmann's challenge: Analysis with TAG



$$\boxed{0}\begin{bmatrix} \textsc{frame} & \begin{bmatrix} \textit{assistance-activity} \\ \textsc{actor} & \boxed{1} \\ \textsc{instr} & \boxed{2} \end{bmatrix} \\ \textsc{morph} & \begin{bmatrix} \textsc{lemma} & \text{pull} \end{bmatrix} \end{bmatrix} \vee \ldots$$

$$\boxed{2}\begin{bmatrix} \textsc{morph} & \begin{bmatrix} \textsc{lemma} & \text{string} \\ \textsc{num} & \text{pl} \end{bmatrix} \end{bmatrix}$$

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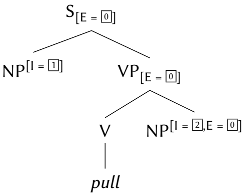
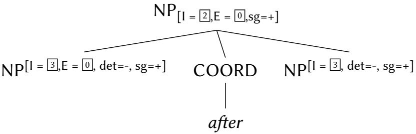
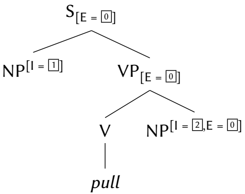


$$\begin{array}{l} \boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{assistance-activity} & \\ \text{ACTOR} & \boxed{1} \\ \text{INSTR} & \boxed{2}\end{bmatrix} \\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \text{pull}\end{bmatrix}\end{bmatrix} \\ \boxed{2}\begin{bmatrix}\text{MORPH} & \begin{bmatrix}\text{LEMMA} & \text{string}\\ \text{NUM} & \text{pl}\end{bmatrix}\end{bmatrix} \end{array} \vee \ldots$$

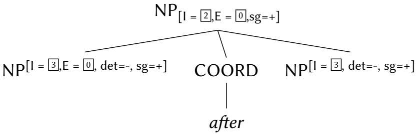


$$\begin{array}{l} \boxed{2}\begin{bmatrix} \text{FRAME} & \boxed{4} \\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \boxed{5}\\ \text{NUM} & \text{pl}\end{bmatrix}\end{bmatrix} \\ \boxed{3}\begin{bmatrix} \text{FRAME} & \boxed{4} \\ \text{MORPH} & \begin{bmatrix}\text{LEMMA} & \boxed{5}\end{bmatrix}\end{bmatrix} \end{array} \vee \ldots$$

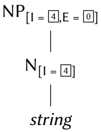
Bargmann's challenge: Analysis with TAG



$$\begin{array}{l} \boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{assistance-activity} & \\ \text{ACTOR} & \boxed{1} \\ \text{INSTR} & \boxed{2} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{pull} \end{bmatrix} \end{bmatrix} \\ \boxed{2}\begin{bmatrix} \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{string} \\ \text{NUM} & \text{pl} \end{bmatrix} \end{bmatrix} \end{array} \vee \ldots$$

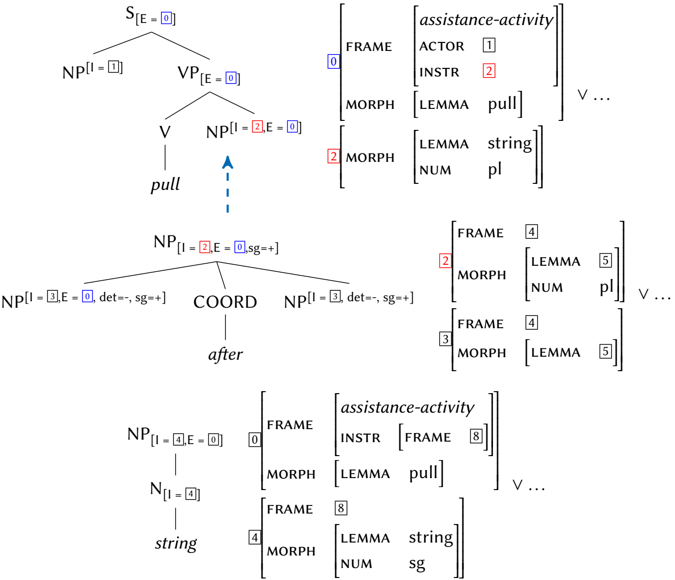


$$\begin{array}{l} \boxed{2}\begin{bmatrix} \text{FRAME} & \boxed{4} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \boxed{5} \\ \text{NUM} & \text{pl} \end{bmatrix} \end{bmatrix} \\ \boxed{3}\begin{bmatrix} \text{FRAME} & \boxed{4} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \boxed{5} \end{bmatrix} \end{bmatrix} \end{array} \vee \ldots$$

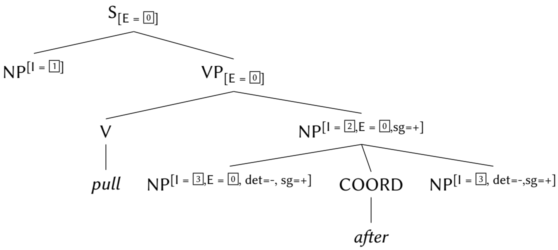


$$\begin{array}{l} \boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{assistance-activity} & \\ \text{INSTR} & \begin{bmatrix} \text{FRAME} & \boxed{8} \end{bmatrix} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{pull} \end{bmatrix} \end{bmatrix} \\ \boxed{4}\begin{bmatrix} \text{FRAME} & \boxed{8} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{string} \\ \text{NUM} & \text{sg} \end{bmatrix} \end{bmatrix} \end{array} \vee \ldots$$

Bargmann's challenge: Analysis with TAG



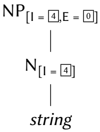
Bargmann’s challenge: Analysis with TAG



$$\boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{assistance-activity} & \\ \text{ACTOR} & \boxed{1} \\ \text{INSTR} & \boxed{2} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{pull} \end{bmatrix} \end{bmatrix}$$

$$\boxed{2}\begin{bmatrix} \text{FRAME} & \boxed{4} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \boxed{5}\ \text{string} \\ \text{NUM} & \text{pl} \end{bmatrix} \end{bmatrix} \lor \ldots$$

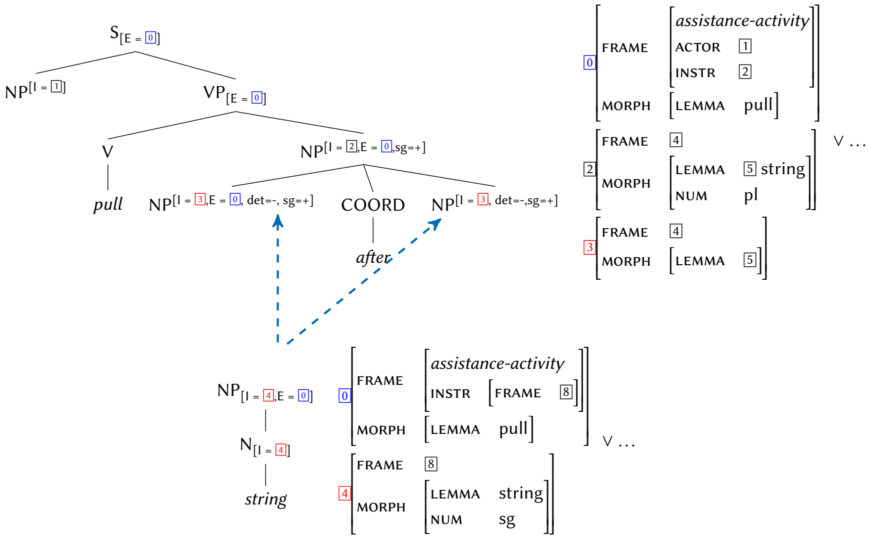
$$\boxed{3}\begin{bmatrix} \text{FRAME} & \boxed{4} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \boxed{5} \end{bmatrix} \end{bmatrix}$$

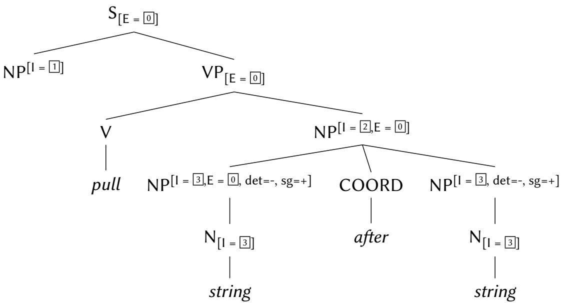


$$\boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{assistance-activity} & \\ \text{INSTR} & \begin{bmatrix} \text{FRAME} & \boxed{8} \end{bmatrix} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{pull} \end{bmatrix} \end{bmatrix} \lor \ldots$$

$$\boxed{4}\begin{bmatrix} \text{FRAME} & \boxed{8} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{string} \\ \text{NUM} & \text{sg} \end{bmatrix} \end{bmatrix}$$

Bargmann's challenge: Analysis with TAG





$$\boxed{0}\begin{bmatrix} \text{FRAME} & \begin{bmatrix} \textit{assistance-activity} & \\ \text{ACTOR} & \boxed{1} \\ \text{INSTR} & \boxed{2}\begin{bmatrix} \text{FRAME} & \boxed{4} \end{bmatrix} \end{bmatrix} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \text{pull} \end{bmatrix} \end{bmatrix}$$

$$\boxed{2}\begin{bmatrix} \text{FRAME} & \boxed{4} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \boxed{5}\ \text{string} \\ \text{NUM} & \text{pl} \end{bmatrix} \end{bmatrix} \vee \ldots$$

$$\boxed{3}\begin{bmatrix} \text{FRAME} & \boxed{4} \\ \text{MORPH} & \begin{bmatrix} \text{LEMMA} & \boxed{5}\ \text{string} \\ \text{NUM} & \text{sg} \end{bmatrix} \end{bmatrix}$$

A lexicon-/disjunction-based approach with TAG

Advantages:

- unified syntax of literal and idiomatic readings
- delayable ambiguity resolution
- adequate in terms of human processing

  (Prediction: increased semantic processing load; **no** categorical difference between lexical and idiomatic meanings)
- closer connection between literal and idiomatic meanings

\+ contraint-based composition

Outline

Summary

The landscape of approaches to idiomatic MWEs from a TAG perspective:

literal vs. idiomatic readings

- syntactic ambiguity
  non-compositional
- semantic ambiguity
  - lexicon-/disjunction-based
    compositional
    ↑
    our favorite!
  - inference-based
    non-compositional

⇒ One approach for all types of MWEs?

⇒ Connection between literal and idiomatic meaning?

⇒ Multi-dimensional approach following Ernst (1981)?

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