

Depictive Secondary Predication as Long-Distance Modification

Theory and Corpus Evidence

Benjamin Burkhardt, Laura Kallmeyer, Timm Lichte

CRC991: University of Düsseldorf

May 24th 2019



SFB 991



HEINRICH HEINE
UNIVERSITÄT DÜSSELDORF

Secondary Predicates

Secondary Predicate (**SP**): a typically sentence final, adjectival element that predicates one of the (main) verbal predicate's arguments; we call the predicated element the **TARGET**.

Resultatives (RSPs) characterize states that are brought about by the event that is expressed by the main verb.

(1) Sean stomped the can_i flat_i.

Depictives (DSPs) express properties that hold for at least some part of the event time, but do not immediately result from the verb event.

(2) Tom ate the pizza_i cold_i.

Research Goals

- 1 Development of an LTAG analysis of DSPs with semantic frames
- 2 Raising empirical (counter-)evidence of the predictions by querying a large web corpus (Main focus of this talk)

- 1 Properties of Depictives
- 2 LTAG: The Framework & Depictive Analysis
- 3 Corpus Study: Finding Real Data
- 4 Implications & Future Work

- 1 Properties of Depictives
- 2 LTAG: The Framework & Depictive Analysis
- 3 Corpus Study: Finding Real Data
- 4 Implications & Future Work

Possible Targets I

Target Ambiguity

Based on their semantic compatibility, depictives either target the subject or the object.

- (3) a. Kim ate the steak_i raw_i.
b. Kim_i ate the steak hungry_i.

If both verbal arguments are semantically compatible with the depictive
TARGET AMBIGUITY arises.

- (4) Kim_i ate the apple_j unwashed_{i/j}.

Possible Targets II

Stacking

DEPICTIVE STACKING is possible, but generally seems to decrease acceptability.

- (5) a. ? Kim_i ate the steak_j raw_j hungry_i.
b. ?? Kim_i ate the steak_j hungry_i raw_j.
c. ?? Kim ate the steak_j raw_j salted_j.

Wellnested stacks with alternating targets seem more acceptable than illnested or non alternating stacks.

Possible Targets III

Unrealized Arguments

Depictives may target unrealized agents, see (6-a), or theme arguments, see (6-b).

- (6) a. The book_j is to be read naked_{i/*j}.
- b. We_i usually bake gluten-free_{i/*j}.

In some instances, like in (7) from Roberts (1987), one could argue for an adverbial interpretation, where *barefoot* lacks the prototypical morphology of English adverbials.

- (7) The game_j was played barefoot_{i/*j}. (Roberts 1987)

Impossible Targets I

Oblique Arguments

Oblique verbal arguments, i.e. non-direct objects and PP-objects, do not constitute viable targets.

- (8) a. The cash machine_i gave John_j the money_k hungry^{*_i/*_j/*_k}.
b. Peter crashed into him_i tired^{*_i}.

Impossible Targets II

Non-Arguments

Depictives cannot target modifying constituents like PP-adjuncts.

(9) John drilled a hole with a power tool_i new*_i.

Neither the genitive noun in (10-a) nor the single conjuncts in (10-b) constitute viable targets.

(10) a. John met Maria's_i father naked*_i.

b. [John_i and Paul_j]_k met [Maria_m and her boyfriend_n]_o
naked*_{i/*j/k/*m/*n/o}.

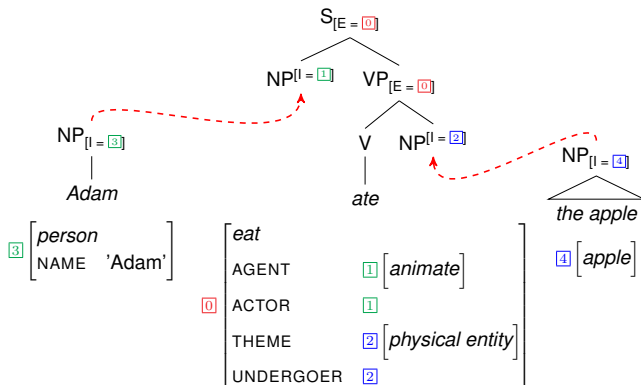
Outline

- 1 Properties of Depictives
- 2 LTAG: The Framework & Depictive Analysis
- 3 Corpus Study: Finding Real Data
- 4 Implications & Future Work

The Framework: LTAG with Frame Semantics

- Elementary trees are coupled with frames (typed, recursive, functional feature structures).
- The combination of elementary trees (through substitution and adjunction) triggers the unification of the respective frames.
- Base labels in the interface features specify where frames are unified.

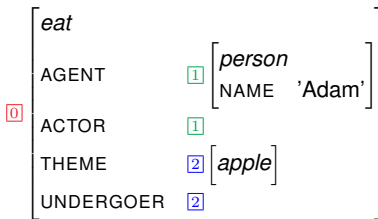
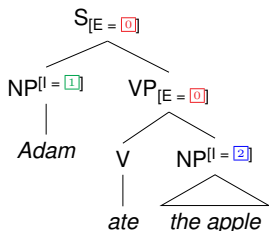
Example: Sample derivation of *Adam ate the apple*.



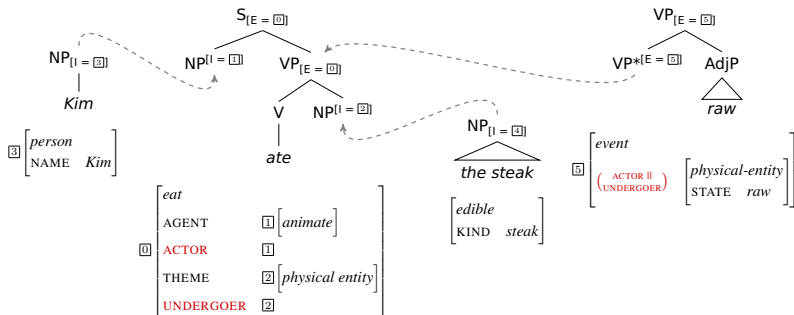
The Framework: LTAG with Frame Semantics

- Elementary trees are coupled with frames (typed, recursive, functional feature structures).
- The combination of elementary trees (through substitution and adjunction) triggers the unification of the respective frames.
- Base labels in the interface features specify where frames are unified.

Example: Sample derivation of *Adam ate the apple*.



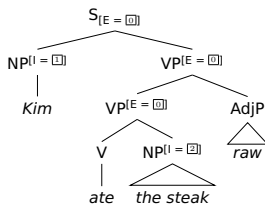
LTAG Depictive Analysis



Example: Derivation of *Kim ate the steak raw*.

- The DSP tree is adjoined at the VP level and adds to the verbal frame information.
- **Ambiguity** in the frame description the of DSP enables it modify either the ACTOR or UNDERGOER description in the verb frame.

LTAG Depictive Analysis



	<i>eat</i>	
	AGENT	$[1]$ $\left[\begin{array}{l} person \\ NAME \quad Kim \end{array} \right]$
$[0]$	ACTOR	$[1]$
	THEME	$[2]$ $\left[\begin{array}{l} edible \\ KIND \quad steak \\ STATE \quad raw \end{array} \right]$
	UNDERGOER	$[2]$

Example: Derived tree of *Kim ate the steak raw*.

- **Licenses:** target ambiguity, targeting of unrealized arguments, and depictive stacking
- **Predicts:** targeting of oblique objects or adjuncts are ungrammatical

Outline

- 1 Properties of Depictives
- 2 LTAG: The Framework & Depictive Analysis
- 3 Corpus Study: Finding Real Data**
- 4 Implications & Future Work

- Most examples in the literature are either constructed or anecdotal.
- Lack of systematic studies of the phenomenon (acceptability judgment studies and corpus studies)
- **Main Questions:**
 - Which SP constructions are observable in real data?
 - Is our analysis compatible with the data? (Targeting of oblique objects)
 - Can we find instances of DSP stacking?
- **Expectation:** SPs are a relatively rare phenomenon → a large and stylistically diverse corpus of English would be well suited for the task

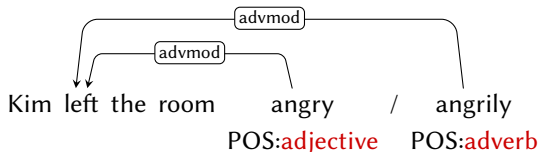
- ENCOW16AX is a large corpus of English with $\approx 9,6$ Billion tokens (scrambled on sentence level).
- Since it is web-based, it covers a wide variety of Englishes and both formal and colloquial texts.
- The corpus is dependency parsed (Stanford dependencies), and also includes Part-Of-Speech as well as lemma information for each token (Penn Treebank).
- The corpus creation pipeline is open source and the corpus itself can be used free of charge.

- We conduct our corpus study by using a selection of 10 frequent adjectival stage level predicates, e.g. *naked*, *hot*, *happy*, and *sick*.
- A preliminary analysis indicates that **stage level predicates** are more likely to appear in SP constructions.
- The stage and individual level predicate distinction is not rigid, however the concept proves useful in our study.

Method II

SPs appear in positions where usually adverbial modifiers could appear.

- (11) a. Kim left_i the room angrily_i. (Adverbial)
b. Kim_i left the room angry_i. (Depictive)

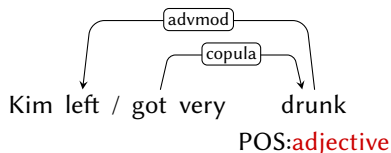


⇒ We are looking for adjectives in adverbial modifier positions.

Method III

At the same time, SPs at first glance look similar to copula-like constructions.

- (12) a. Kim got very drunk. (Copula)
b. Kim_i left very drunk_i. (Depictive)



⇒ We exclude copula and “copula-like” constructions.

Extracting SPs & Sampling

The following three steps are applied to extract samples for each DSP candidate item (implemented in Python) :

Step	Filter	Sentence Count
0.	None (complete ENCOW16AX)	\approx 421 Million
1.	POS: adjective, DepRel: advmod	\approx 4 Million
2.	No copula constructions	\approx 2.4 Million
3.	Sampling	200 per adjective

To receive samples of 200 sentences we query the subcorpus without any Copula and apply some additional filters based on the adjective at hand.

First Results

- The 200 sentence sample for *naked* as found within the first 269067 sentences of the "No Copula Subcorpus" (Ratio: $\approx 0.07\%$).
- Annotation of the sample yielded the following results:

Construction	Frequency	Percentages
Depictives	142	71%
Actor oriented	120	60%
Undergoer oriented	13	6.5%
Unrealized target	4	2%
Sentence initial	5	2.5%
Resultatives	9	4.5%
Other	36	18%
Out	13	6.5%

- *Other* category: misidentified copula constructions, adnominal uses of the adjective, nominalizations
- *Out*: non-contemporary data (e.g. bible verses), sentence fragments.
- No instance of target stacking was found.
- The annotation was done manually by the speaker.

Embedded target?

- (13) a. Images of women swirl naked on the ceiling [...].
b. Naked, you can see her ribs through the dusty white of her back.

Unrealized target?

- (14) It feels so much better naked.

Fronted depictive:

- (15) There, naked, cold in the draft from the vent, he'd put his head in his hands and listened to her cry.

Depictive-Resultative Coordination?

- (16) If things get boring, competitors can just strip and run around naked.

Fixed expression?

(17) I am going to roll around naked in all that money!

Resultatives?

- (18) a. You had to strip naked and stand on this tree stump.
b. Will I be asked to strip butt naked or is it just down to boxers?

- 1 Properties of Depictives
- 2 LTAG: The Framework & Depictive Analysis
- 3 Corpus Study: Finding Real Data
- 4 Implications & Future Work

- So far the results support the analysis given above.
- The analysis needs to be extended to support fronted depictive constructions.
- **Future work:** look into the distributional differences among the different target adjectives to further specify semantic restrictions.

Thanks for your kind attention!

Pssst, ask me about the implemented grammar resource and corpus filter scripts on Github.