Made for Each Other: Broad-coverage Semantic Structures Meet Preposition Supersenses

Jakob Prange   Nathan Schneider
Georgetown University
jakob@cs.georgetown.edu
nathan.schneider@georgetown.edu

Omri Abend
The Hebrew University of Jerusalem
oabend@cs.huji.ac.il

A   Non-canonical phenomena requiring special rules

Predication.   If the adposition denotes a predication via a copular construction as in "They were **back** quickly" or "was not **in** the agreement as well", the supersense refines the syntactic object, if it is explicit, or the adposition unit itself, if not.

Linkage.   Subordinating conjunctions, which are included as adpositional expressions if the same lemma can also be used as a canonical adposition (with a nominal object), project their supersense onto the subordinated clause ("**after** [reading some of the news]" in figure 1).

Infinitival purpose markers.   While infinitival *to* is not considered as marking a semantic role in most cases, certain uses of *to*, which elaborate on the purpose of an action or entity, are annotated. These project their supersense onto the elaborating unit in which they occur.

Intransitive adpositions.   If the adposition is intransitive—due to blurry definitions, we avoid the notions of *particles* and *adverbs* here—the supersense continues to refine the adposition unit ("drive 10 minutes more **down** to Stevens Creek").

Approximators.   Approximating adpositions like *around* and *about* ("I bought **about** half of the furniture") similarly keep their supersense; in contrast to *intransitive* adpositions, which express a relation between their governor and an implicit object, approximators elaborate on their object without specifying a relation towards the governor.

Possessive pronouns.   Possessive pronouns keep their supersense refinement, whether they express true possession ("we got **our** food") or a participant or other derived relation ("**our** company was just getting started").

Idiomatic PPs.   When a prepositional phrase is classified as idiomatic in STREUSLE (e.g., "in town"), its supersense refines the adposition token.

B   Extended Evaluation

See table 1 for a detailed UCCA parsing evaluation of units with a gold SNACS supersense in their yield and siblings thereof. Looking at the siblings of SNACS-bearing units can tell us that getting PP unit spans right also helps with non-PP children of a scene. Furthermore, adpositions that are inter-scene Linkers in UCCA are siblings to their refined arguments. This might also be a reason why the numbers are generally lower for siblings, as getting a full scene unit correct is more difficult than smaller units. Another reason could be that the set of units that are siblings to gold-ss units is more prone to change due to small differences in the gold-ss units themselves.

system		gold-ss labeled			gold-ss unlabeled			gold-ss sib labeled			gold-ss sib unl.		
setup	ref	P	R	F	P	R	F	P	R	F	P	R	F
BL	–	74.2	73.9	74.1	93.3	92.9	93.1	47.7	48.0	47.9	60.7	61.1	60.9
pipeline	ter	76.5	76.2	76.4	94.5	94.2	94.4	48.1	49.2	48.8	61.1	62.4	61.7
		79.2	78.9	79.1	95.8	95.4	95.6	51.0	50.8	50.9	63.5	63.3	63.4
indep MTL	ter	72.4	72.4	72.4	**96.0**	**96.0**	**96.0**	46.8	**50.4**	48.6	59.8	**64.5**	62.1
dep MTL	ter	**77.5**	**77.5**	**77.5**	95.2	95.2	95.2	46.7	48.9	47.8	60.2	63.2	61.6
	rel	73.5	72.9	73.2	94.1	93.3	93.7	**48.7**	50.0	**49.3**	**62.4**	64.1	**63.2**
joint	ter	73.2	73.1	73.1	95.2	95.0	95.1	47.9	46.9	47.4	62.2	60.8	61.5
	rel	73.1	73.1	73.1	95.2	95.2	95.2	44.5	46.3	45.4	57.7	59.9	58.8

Table 1: UCCA parsing performance on units with a gold SNACS label in their yield (*gold-ss*) and siblings of such units (*gold-ss sib*).