We adopt SNACS and extend its use to annotate subjects and objects of verbs.

Note that many of the semantic labels in SNACS derive from VerbNet role labels. However, VerbNet and other frame-semantic approaches assume a lexicon as a prerequisite for semantic role annotation.

1. The bagel was eaten by \textit{Agent} Jane.
2. Jane dined on \textit{Theme}, a bagel.

SNACS is unique in allowing two semantic labels per target:

**Scene Role**

What semantic role is most closely associated with the type of scene?

**Function**

What semantic role is most salient in the morphosyntactic coding of the phrase?

In many cases, the scene role will be identical to the function. These are called congruent construals. But in other cases, they can differ.

**Scene Role and function**

(3) \textit{Jane} \textit{Recipient} \textit{Agent} bought the book: \textit{Possession} \textit{Theme}.

(4) \textit{Bingley} \textit{SocialRel} \textit{Theme} married \textit{Jane}.

The scene role indicates the participation role of the target in the scene described by the verb. The function label, on the other hand, captures the orthogonal dimension, which is more closely tied to syntactic realization.

**Scene role prioritization**

In some cases, multiple supersenses are equally applicable at the scene level. In such cases we give highest priority to more complex and less scenes types such as: \textit{(Originator, Recipient)} or \textit{(Organmember, Org, SocialRel)}. The causal roles \textit{Agent, Instrument, Theme} are prioritized next, the highly frequent locatives \textit{(Locus, Source, Goal)} are given the lowest priority.

(5) \textit{Jane} \textit{Recipient} \textit{Agent} took the book from \textit{me}.

\textit{Recipient} takes priority over \textit{Goal}.

**Role duplication**

Unlike the latest version of SNACS we adopt for our study, in this work we allow participant labels such as \textit{Agent} or \textit{Theme} to appear multiply in a given sentence.

(6) A reception \textit{Theme} \textit{Theme} will precede \textit{the dinner} \textit{Theme} \textit{Theme}.

(7) He \textit{Experiencer} \textit{Theme} heard the news \textit{with} a \textit {Stranger} \textit{Experiencer} \textit{Accompany}.

(8) Replace \textit{the old one} \textit{Theme} \textit{Theme} \textit{with} the \textit{new one} \textit{Theme} \textit{Accompany}.

**Thematic hierarchy**

The function label generally reflects \textit{Agent-Theme} relations of a proposition. More specifically, we annotate all subjects and direct objects with a function in the following thematic hierarchy: \{\textit{Agent, Cause} \textit{Instrument, Means} \textit{Topic, Topic, Cost}\}

**Copular sentences**

These are treated differently from non-copular sentences. The English copula relates a subject to an object in what is semantically an identificational or predicational relationship.

(9) a. \textit{John} \textit{Identity} \textit{Identity} is a man \textit{Identity} \textit{Identity}.

b. \textit{John} \textit{Gestalt} \textit{Theme} is \textit{tall} \textit{Characteristic} \textit{Characteristic}.

**Applying SNACS**

**SNACS Background**

SNACS (Semantic Network of Adposition and Case Supersenses) is a hierarchy of preposition and possessive supersenses (Schneider et al. ACL 2018).

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Participant</th>
<th>Configuration</th>
<th>Coding</th>
<th>Function</th>
<th>Congruent?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>Goal</td>
<td>Theme</td>
<td>by Agent</td>
<td>Agent</td>
<td>✓</td>
</tr>
<tr>
<td>Put the book on the shelf</td>
<td>GOAL</td>
<td>on</td>
<td>LOCUS</td>
<td>GOAL</td>
<td>✓</td>
</tr>
<tr>
<td>JOHN</td>
<td>T</td>
<td>G</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Interannotator Agreement Study**

**Data**

We piloted our guidelines using a sample of 100 scenes from the English UCCA annotated Wiki corpus as detailed by Abend and Rappoport (2013).

**Annotators**

Four annotators (A, B, C, D), all authors of this paper, took part in this study. All are computational linguistics researchers with advanced training in linguistics.

**Quantitative results**

**Subjects/objects**: For the scene role, all annotators agree on 46% of items (26/57), and at least 3 annotators on 84%. For the function, 51% have total agreement, and 86% have a majority. Average pairwise \(k = 0.66\) for scene and 0.61 for function.

**PPs**: At the scene level, 48% (20/42) have total agreement, and 71% have a majority. For the function, 64% have total agreement, and 68% have a majority. Average pairwise \(k = 0.64\) for scene and 0.77 for function.

**Disagreements involving agentivity**

We found it can be difficult to choose between \textit{Agent} and \textit{Theme} for the function of a subject with borderline agentivity, e.g., in scenes of befriending someone or forming a musical group with others. Likewise, the line between \textit{Agent} and \textit{Theme} for the function can be unclear in cognition scenes like: \textit{[She] enjoyed the fame}.

**Conclusion**

We explored whether a system for semantic relation annotation can be extended beyond prepositions and possessives to cover English subjects and objects.

While initial annotation results are promising, further work is needed to substantiate the approach on a larger scale, and ideally in multiple languages.