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# A stand-off XML-TEI representation of reference annotation

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## Background and previous work

- Multilingual corpus project on French, Spanish, Persian, and Catalan
- Spontaneous speech data elicited in a game task
- More info: [www.sgscorpus.com](http://www.sgscorpus.com)
- Building on extensive work on (stand-off) representation of referring expressions and referential links [4,6] and types of links [5]
- So far, no existing models making a clean distinction between expression-related and entity-related features and links

## What's new?

- Reference annotation is an essential element in corpus-linguistic research at the interface of syntax and discourse structure.
- We propose a representation based on a semantically plausible model distinguishing referring expressions, discourse referents, and links.
  - Neater representation of grammatical vs. semantic features and of phenomena of indirect reference ("bridging")
  - More efficient annotation of longer stretches of natural discourse
  - Integrated in a multilayer stand-off annotation in compliance with TEI-ISO standards: MAF [1], SynAF [2], RAF [3]

## Example

(Persian, Interview 12, line 121):

(1) dAdAS-eS-o doxtar-eS ke az SahrestAn umade budan.  
brother-3SG.POSS-and daughter-3SG.POSS C-TOP from province came  
'His brother and his daughter came from the province.'

### Links

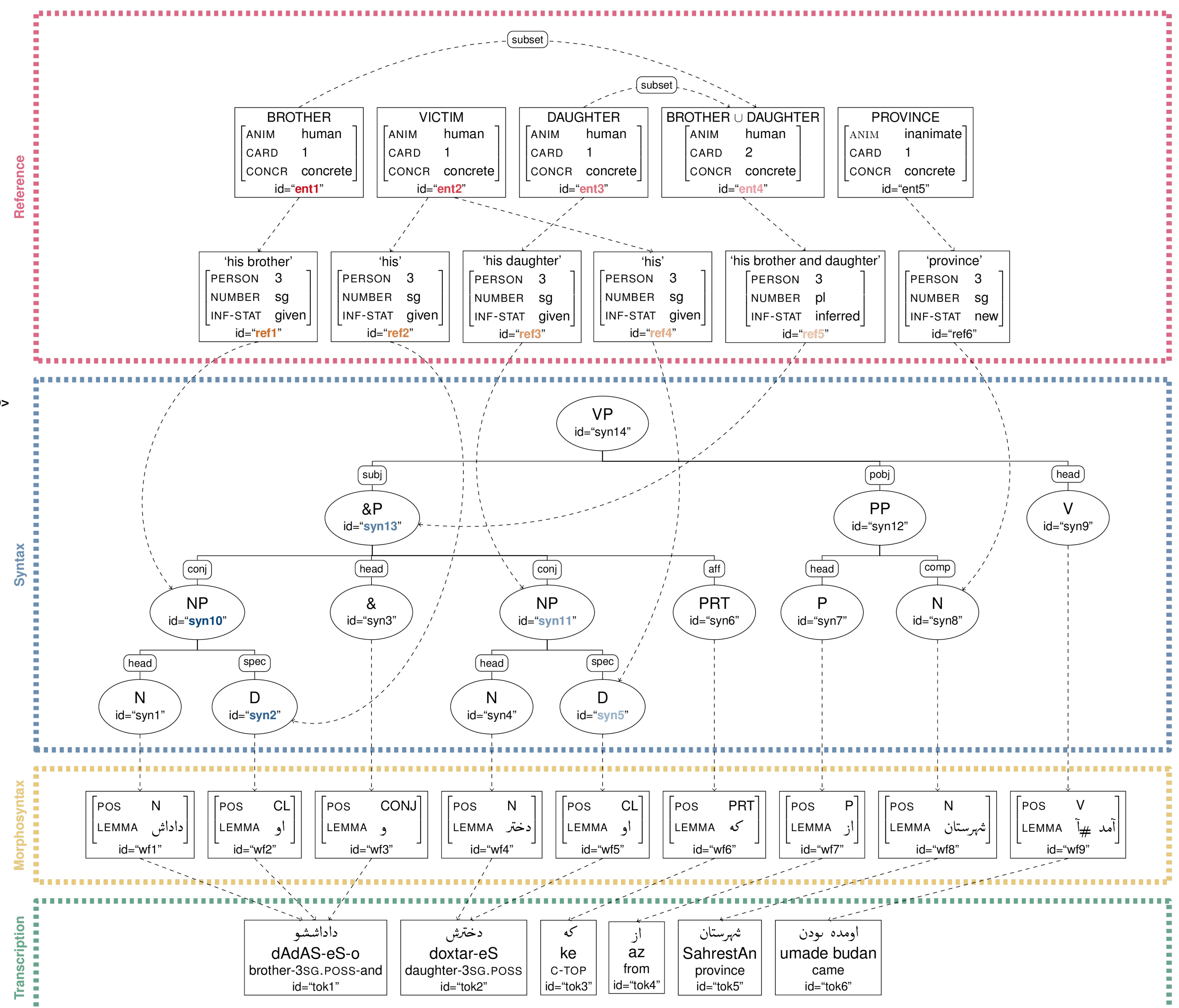
```
<so:standOff type="reference">
  <so:listAnnotation type="link">
    <linkGrp type="objectalLink">
      <link xml:id="link1" target="#ent1 #ent4" ana="#link1-ana"/>
      <link xml:id="link2" target="#ent3 #ent4" ana="#link2-ana"/>
    </linkGrp>
    <fs xml:id="link1-ana"><symbol value="subset"/></fs>
    <fs xml:id="link2-ana"><symbol value="subset"/></fs>
  </so:listAnnotation>
</so:standOff>
```

### Discourse referents

```
<so:standOff type="discourseEntity">
  <interpGrp>
    <interp xml:id="ent1" inst="#ref1" ana="ent1-ana">brother_of_victim</interp>
    <interp xml:id="ent2" inst="#ref2 #ref4" ana="ent2-ana">victim</interp>
    <interp xml:id="ent3" inst="#ref3" ana="ent3-ana">daughter_of_victim</interp>
    <interp xml:id="ent4" inst="#ref5" ana="ent4-ana">brother_and_daughter</interp>
  </interpGrp>
  <fs xml:id="ent1-ana">
    <f name="animacy"><symbol value="human"/></f>
    <f name="abstractness"><symbol value="concrete"/></f>
  </fs>
  <fs xml:id="ent4-ana">
    <f name="animacy"><symbol value="human"/></f>
    <f name="abstractness"><symbol value="concrete"/></f>
  </fs>
</so:standOff>
```

### Referring expressions

```
<so:standOff type="referringExpression">
  <annotationBlock xml:id="ref-u-12-121" target="#u-12-121">
    <spanGrp>
      <span xml:id="ref1" target="#syn10" ana="#ref1-ana"/>
      <span xml:id="ref2" target="#syn2" ana="#ref2-ana"/>
      <span xml:id="ref3" target="#syn11" ana="#ref3-ana"/>
      <span xml:id="ref4" target="#syn5" ana="#ref4-ana"/>
      <span xml:id="ref5" target="#syn13" ana="#ref5-ana"/>
    </spanGrp>
    <fs xml:id="ref1-ana">
      <f name="person"><symbol value="3"/></f>
      <f name="grammaticalNumber"><symbol value="singular"/></f>
      <f name="informationStatus"><symbol value="given"/></f>
    </fs>
    <fs xml:id="ref5-ana">
      <f name="person"><symbol value="3"/></f>
      <f name="grammaticalNumber"><symbol value="plural"/></f>
      <f name="informationStatus"><symbol value="inferred"/></f>
    </fs>
  </annotationBlock>
</so:standOff>
```



## Model features

- Separation of primary data (transcription) and secondary data (annotations)
- Incremental build-up of annotation layers
- Three-way distinction of reference-related features
  - Local **grammatical features** (grammatical gender, number, person) and sentence-bound discourse features (information status) apply to **referring expressions**.
  - Inherent **semantic features** of referents (animacy, cardinality, specificity, concreteness/abstractness) apply to the **referents**. Their values are constant over the entire discourse.
  - **Relations between referents** (subset, partOf) are recognized as **permanent**, allowing for a better representation of so-called bridging phenomena in discourse.

## Future work

- User-friendly visualization and query interface (in ANNIS)
- Integration of different levels of information structure analysis
  - [ $\pm$ topical] as feature of a referring expression?
  - Markup of focus domains directly on syntactic phrases?
- Further expansion of the multilayer architecture to the analysis of other cross-sentential phenomena, e.g., rhetorical structure, dialogue analysis

## References

- [1] ISO 24611:2012 Language resource management — Morpho-syntactic annotation framework (MAF).
- [2] ISO 24615-1:2014 Language resource management — Syntactic annotation framework (SynAF) — Part 1: Syntactic model.
- [3] ISO/AWI 24617-9 [Under development] Language resource management — Semantic annotation framework — Part 9: Reference Annotation Framework.
- [4] Poesio, M., 2004. The MATE/GNOME proposals for anaphoric annotation, revisited. In *Proceedings of the 5th SIGdial Workshop on Discourse and Dialogue at HLT-NAACL 2004*, 154-162.
- [5] Riester, A. and Baumann, S., 2017. The RefLex scheme - Annotation guidelines. *SinSpec* 14. 1-31.
- [6] Salmon-Alt, S. and Romary, L. 2005. The Reference Annotation Framework: A case for semantic content representation. In H. Bunt (ed.), *IWCS-6*, Tilburg, Netherlands: ACL SIGSEM.