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Figure 1: Ontology of morphological analysis. The figure is divided into two panels: 2.1 Representation of decompositional building patterns for lexical entries, and 2.2 Representation of decompositional building patterns for forms.

**2.1 Representation of decompositional building patterns for lexical entries.**

Panel 2.1 shows the relationships between the following concepts:

- ontolex:LexicalEntry** (grey box)
- ontolex:Affix** (grey box)
- morph:Rule** (purple box)
- morph:FormationPattern** (purple box)
- morph:Replacement** (purple box)

Relationships (edges) shown in Panel 2.1:

- generates** (orange arrow): **ontolex:LexicalEntry** to **morph:Rule**; **ontolex:Affix** to **morph:Rule**.
- morph:hasFormation** (purple arrow): **ontolex:LexicalEntry** to **morph:FormationPattern**.
- morph:derives** (purple arrow): **morph:Rule** to **morph:FormationPattern**.
- morph:next** (purple arrow): **morph:FormationPattern** to **morph:FormationPattern** (self-loop).
- morph:replacement** (purple arrow): **morph:Rule** to **morph:Replacement**.
- morph:example** (purple arrow): **morph:Rule** to **morph:Replacement**.

**2.2 Representation of decompositional building patterns for forms.**

Panel 2.2 shows the relationships between the following concepts:

- ontolex:Form** (grey box)
- morph:Rule** (purple box)
- morph:Paradigm** (purple box)
- morph:InflectionType** (purple box)
- morph:Morph** (orange box)
- morph:MorphValue** (white box)
- ontolex:LexicalSense** (grey box)
- external resource** (blue box)

Relationships (edges) shown in Panel 2.2:

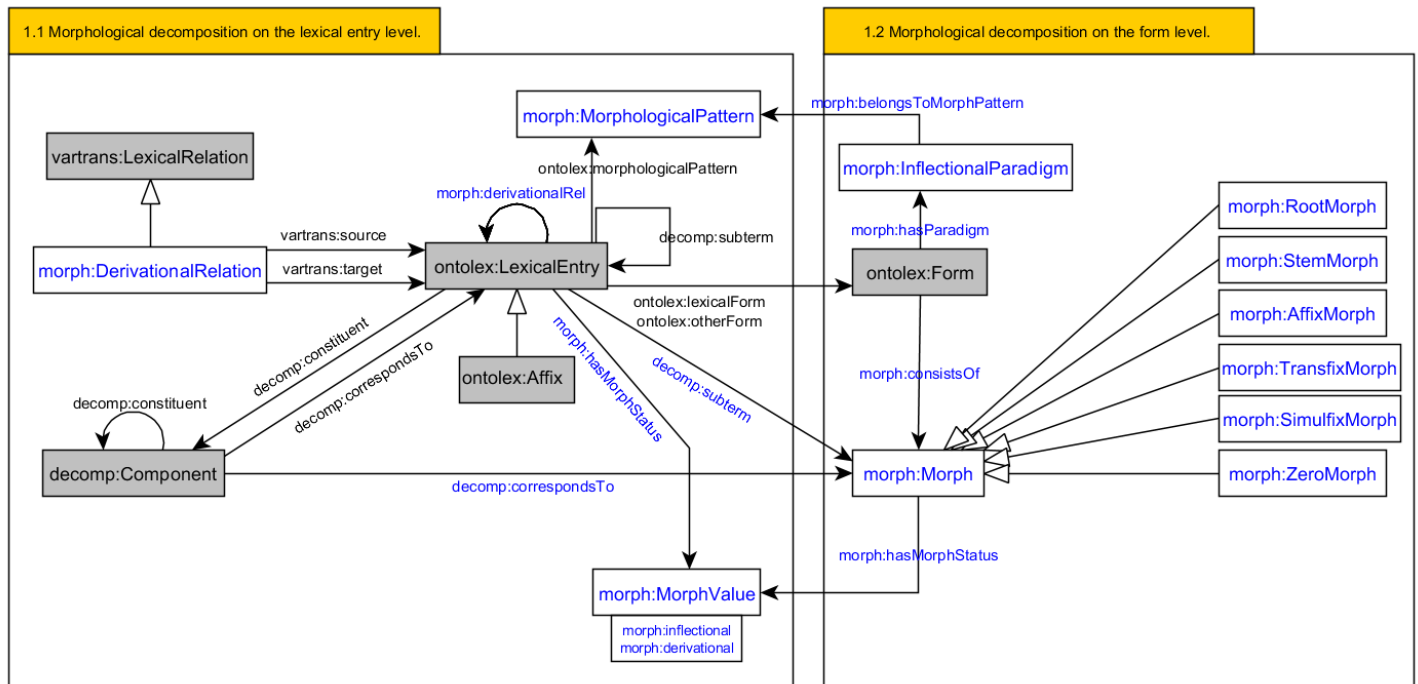
- generates** (orange arrow): **ontolex:Form** to **morph:Rule**; **morph:Rule** to **morph:Paradigm**.
- morph:hasInflection** (purple arrow): **ontolex:Form** to **morph:InflectionType**.
- morph:next** (purple arrow): **morph:InflectionType** to **morph:InflectionType** (self-loop).
- morph:hasParadigm** (purple arrow): **morph:InflectionType** to **morph:Paradigm**.
- morph:inflects** (purple arrow): **morph:Rule** to **morph:InflectionType**.
- morph:hasMorphStatus** (blue arrow): **morph:Morph** to **morph:MorphValue**.
- morph:meaning** (blue arrow): **morph:Morph** to **ontolex:LexicalSense**.
- morph:grammaticalMeaning** (blue arrow): **morph:Morph** to **external resource**.
- morph:consistsOf** (purple arrow): **ontolex:Form** to **morph:Morph**.

**Legend:**

- input data graph** (purple box): **morph:Rule**, **morph:FormationPattern**, **morph:Replacement**, **morph:Paradigm**, **morph:InflectionType**.
- output data graph** (orange box): **ontolex:Form**, **morph:Morph**.

- What to do with morph:MorphologicalPattern, morph:belongsToMorphPattern, morph:InflectionalParadigm and morph:hasParadigm? Substitute completely?
- What classes have to be created for the two indicated “?” placeholders?
- Keep two separate diagrams: one for decomposition and one for generation or merge both into one diagram?

### Current modelling draft (as published in eLex paper)



Original ontalex:morphologicalPattern

Definition: The 'morphological pattern' property indicates the morphological class of a word.

domain: ontolex:LexicalEntry

**Todo Max:**

Definition of Max' new elements:

Classes:

Properties:

**Todo Bettina: Adjust diagram according to Max definitions.**

## Spanish example (synthetic, fusional)

```
@prefix :  
<file:///Users/max/Projects/LiODi/Ontolex-morph/dataset-generation-example.ttl#> .  
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .  
@prefix ontolex: <http://www.w3.org/ns/lemon/ontolex#> .  
@prefix lexinfo: <http://www.lexinfo.net/ontology/2.0/lexinfo#> .  
@prefix morph: <https://www.w3.org/community/ontolex/wiki/Morphology#> .  
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .  
  
# Morphology with only one segment  
# Can still have InflectionTypes for assimilation  
  
# If we have morph:example provided for each Rule, we have all the forms already  
# generated. We don't have to, though.  
  
<#amar> a ontolex:Word ;  
    ontolex:canonicalForm [ontolex:writtenRep "amar"@es];  
    morph:inflects <#spanish_verb_type_1a> .  
  
<#comprar> a ontolex:Word ;  
    ontolex:canonicalForm [ontolex:writtenRep "comprar"@es];  
    morph:inflects <#spanish_verb_type_1a> .  
  
<#spanish_verb_type_1> a morph:Paradigm ;  
    rdfs:comment "Theoretically motivated Spanish conjugation type 1"  
    .  
  
<#spanish_verb_type_1a> a morph:InflectionType ;  
    morph:paradigm <#spanish_verb_type_1> ;  
    morph:example "amar"@es .  
  
# *** CASES ***  
  
<#spanish_verb_type_1a_amar_1sg> a morph:Rule ;  
    morph:inflectionType <#spanish_verb_type_1a_amar> ;  
    lexinfo:tense lexinfo:present ;  
    lexinfo:person lexinfo:firstPerson ;  
    lexinfo:number lexinfo:singular ;  
    morph:example "amo"@es ; # optional  
    morph:replacement [morph:source "ar$"; morph:target "o"] .  
  
<#spanish_verb_type_1a_amar_conj_2sg> a morph:Rule ;  
    morph:inflectionType <#spanish_verb_type_1a_amar> ;  
    lexinfo:tense lexinfo:present ;
```

```
lexinfo:person lexinfo:secondPerson ;  
lexinfo:number lexinfo:singular ;  
rdfs:label "-as" ;  
morph:example "amas"@es ; # optional, but if we provide it, all the examples are here  
# morph:replacement [morph:source "ar$"; morph:target "ás"] ; # in principle, this should  
probably be a separate InflectionType. Or not?  
morph:replacement [morph:source "ar$"; morph:target "as"] .
```

An example for a language with just one “slot”, but with not much weird stuff going on (relatively)

## Sanskrit example (synthetic, *extremely* fusional)

```
@prefix :  
<file:///Users/max/Projects/Li0Di/Ontolex-morph/dataset-generation-example.ttl#> .  
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .  
@prefix ontolex: <http://www.w3.org/ns/lemon/ontolex#> .  
@prefix lexinfo: <http://www.lexinfo.net/ontology/2.0/lexinfo#> .  
@prefix morph: <https://www.w3.org/community/ontolex/wiki/Morphology#> .  
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
```

# Morphology with tables

# There are no rules/transformations, only examples

```
<#kāma> a ontolex:Word ; # if we shouldn't use unicode, we need to encode URIs  
      ontolex:canonicalForm [ontolex:writtenRep "kāmaḥ"@sa];  
      morph:inflects <#sanskrit_noun_type_a_stem> .
```

```
<#sanskrit_noun_type_kama> a morph:InflectionType ;  
      morph:paradigm <#sanskrit_noun_type_a_stem> ;  
      morph:example "kāmaḥ"@sa .
```

# \*\*\* CASES \*\*\*

```
<#sanskrit_noun_type_kama_nom_sg> a morph:Rule ;  
morph:inflectionType <#sanskrit_noun_type_kama> ;  
lexinfo:number lexinfo:singular ;  
lexinfo:case lexinfo:nominative ;  
morph:example "kāmaḥ"@sa .
```

```
<#sanskrit_noun_type_kama_acc_sg> a morph:Rule ;  
morph:inflectionType <#sanskrit_noun_type_kama> ;  
lexinfo:number lexinfo:singular ;  
lexinfo:case lexinfo:nominative ;  
morph:example "kāmam"@sa .
```

```
<#sanskrit_noun_type_kama_nom_dual> a morph:Rule ;  
morph:inflectionType <#sanskrit_noun_type_kama> ;  
lexinfo:number lexinfo:dual ;  
lexinfo:case lexinfo:nominative ;  
morph:example "kāmau"@sa .
```

This is an example with a language where it's not really wise to give any rules for transformation, just a table (at least, this a morphological tradition → no morph:replacement, only morph:example).