

Ontological modeling of morphological entities, allomorphy and representation in MG derivation

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Overview

- MG morphological analysis
 - Morphological entities
 - Allomorphy and its types
- Ontologies and Semantic Web
- Ontological modeling of MG
 - Morphological entities
 - Allomorphy and its types
 - Allomorphy derivational framework
 - Representational forms

MG Morphological entities

- Morphemes:
 - Free → mono-morphemic words
 - Grammatical
 - Lexical
 - Bound
 - Roots → AG lexical forms
 - Stems
 - Bases e.g. e.g. *χορ-* (*xor-*) > *χορός* (*xorós*) ‘dance’
 - Affixed bases e.g. *χορεύ-* (*xorev-*) > *χορένο* ‘to dance’
 - Affixes
 - Prefixes e.g. *δια-δρασ-* (*διαδρασ-*), *δια-δρώ* (*δια-δρό*) ‘to interact’
 - Suffixes
 - Der. Suffixes e.g. *-ευ-* (*-ev-*) in *χορ-εύ-ω* (*xor-én-o*)
 - Inf. Suffixes e.g. *-ω* (*-o*) in *χορεύ-ω* (*xorén-o*)
 - Confixes e.g. *γλωσσ-ο-λογία* (*gloss-o-logía*) ‘linguistics’, *μετα-μοντερνισμός* (*meta-mondernismós*) ‘post-modernism’

MG Morphological entities

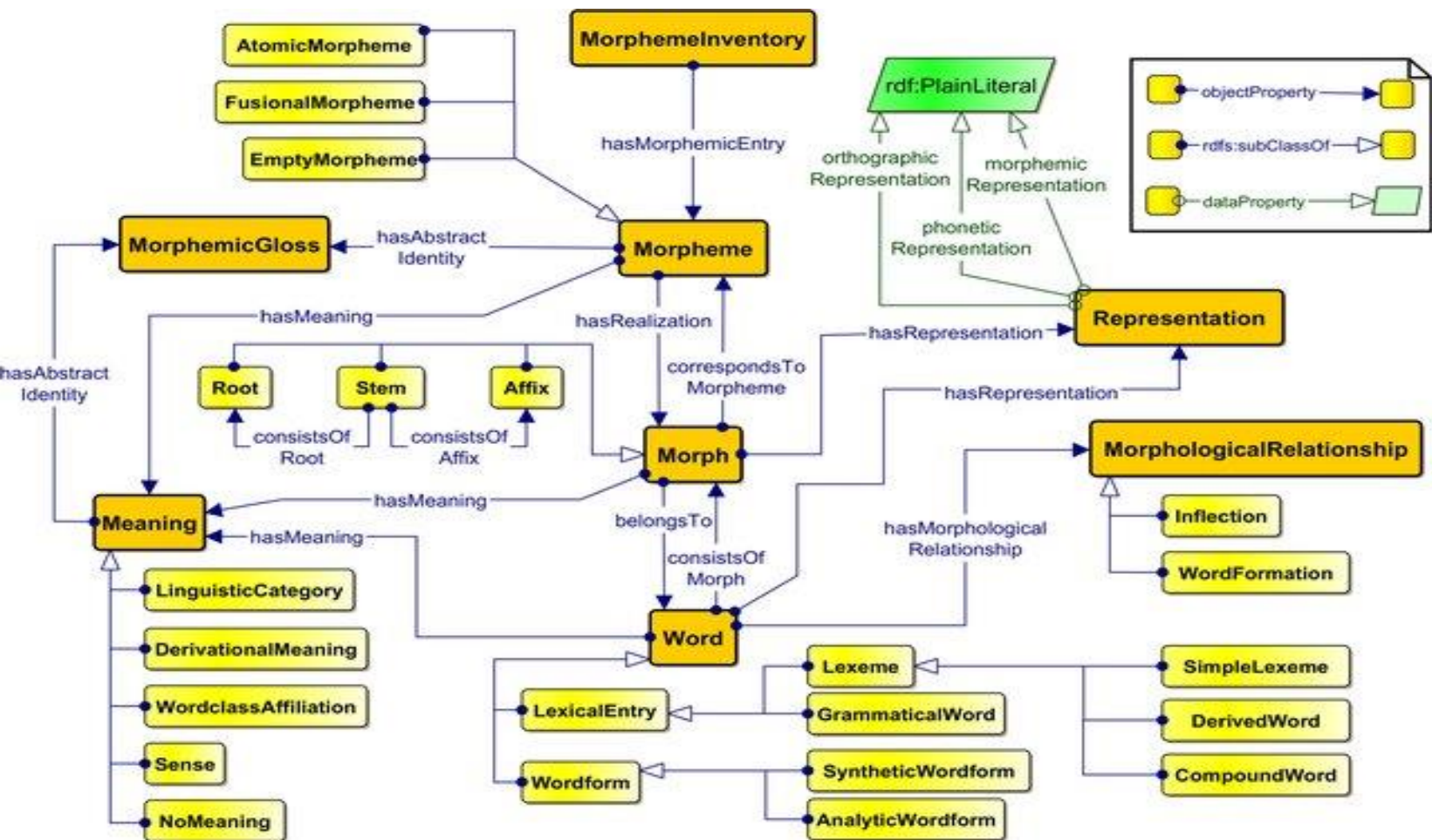
Words:

- Mono-morphemic words
 - Grammatical e.g. **όταν (όταν)** ‘when’, **και (κε)** ‘and’
 - Lexical e.g. **taxi** > **ταξί (taksi)** ‘taxi’
- Multi-morphemic
 - Simple lexemes e.g.
 - **μητέρα- (mitéra-)** > **μητέρα (mitéra)** ‘mother’
 - **χορ-ός (chor-ός)** ‘dance’
 - Derived words e.g. **χορεύ- (xorev-)** > **χορ-εύω (chor-év-o)** ‘to dance’)
- Compounds → not part of this research

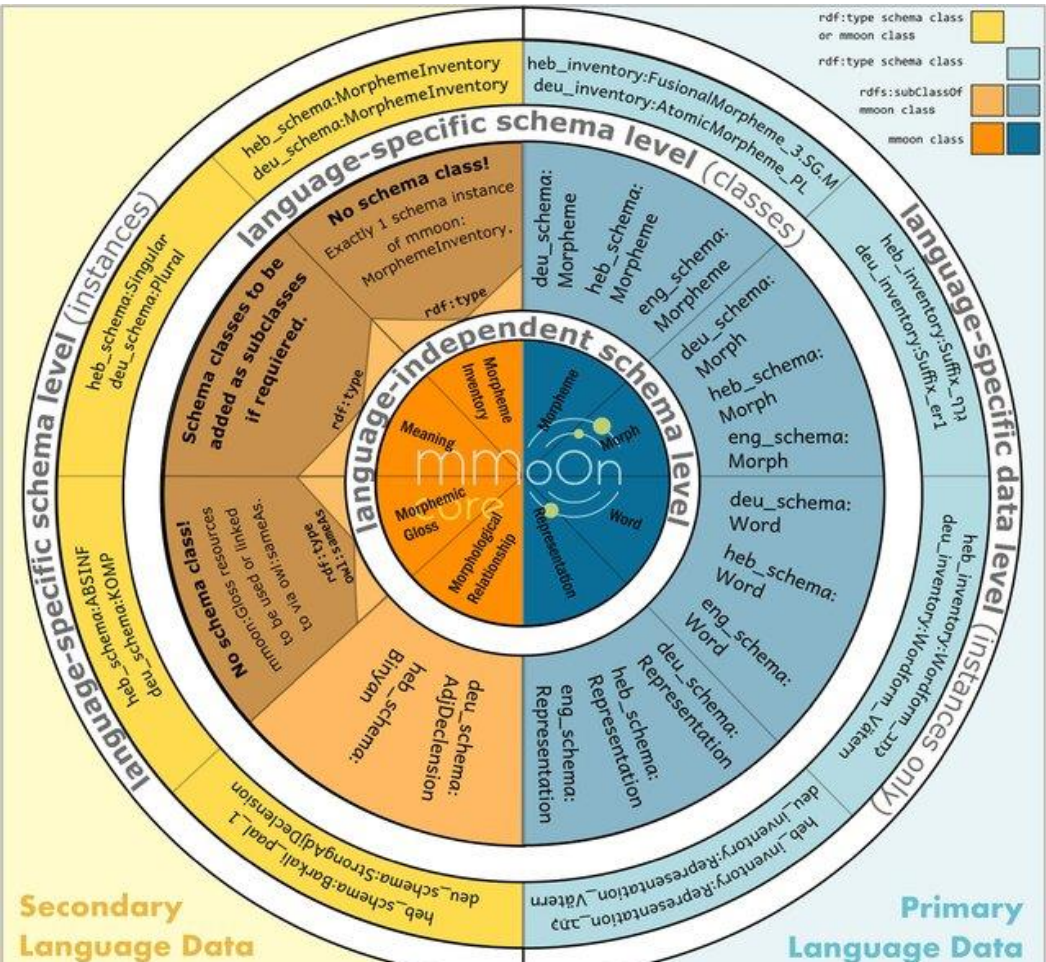
Ontologies within the Semantic Web

- Ontologies are informational models that:
 - Organize and store information as concepts called **classes**
 - Represent those classes by their **instances** e.g. the class Mountain has **Olympus** as its instance
 - Relate instances with a variety of relationships called object or data properties e.g. John **climbs** Olympus
- Semantic Web and Linked Open Data (LOD)
 - Interoperability and Reusability → a common way for systems and humans to understand data
 - Common data models e.g. **RDF, RDFs, OWL, SPARQL**
 - Common syntax e.g. **triple structure** → *subject predicate object* (**John climbs Olympus**) →
 - Every part of the triple is identified by a unique URI/IRI called a **resource** e.g. **<http://myontology.com/Olympus>**
 - Common semantics → specific **ontological schemas** e.g. a morphological ontology

MMoOn architecture



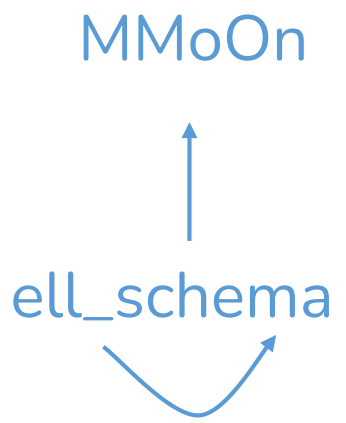
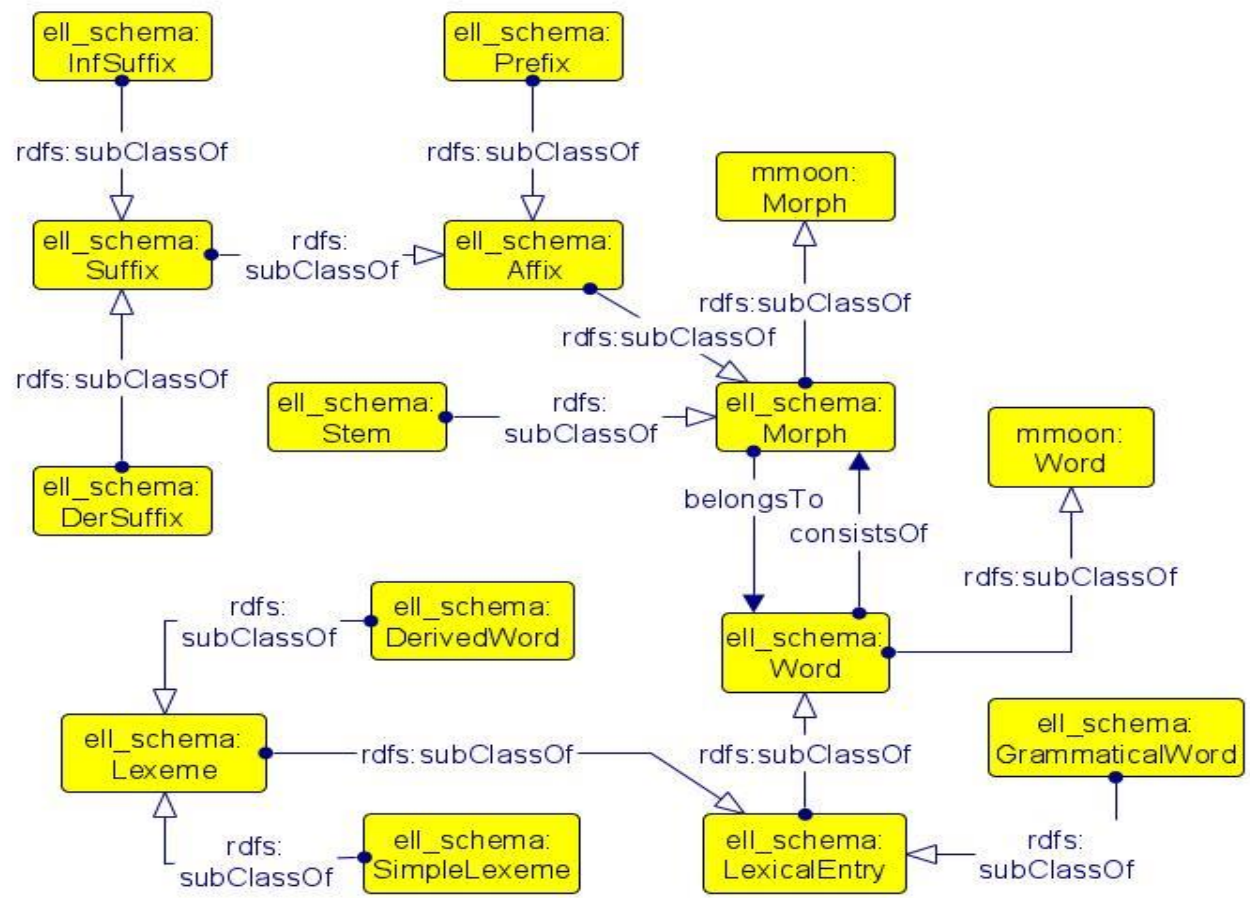
MMoOn architecture



- Language independent schema level
 - eight core classes
- Language-specific schema level (classes)
 - ell_schema subclasses e.g. ell_schema:Suffix subClassOf
 - moonn:Suffix
 - ell_schema:Affix
- Language-specific schema level (instances)
 - ell_schema instances e.g. ell_schema:Plular
 - other vocabularies e.g. LexInfo, GOLD

- Two other options will also be considered:
- To extend only by the new ell_schema classes
 - ell_schema as a stand-alone ontology

Morphological entities - ell_schema



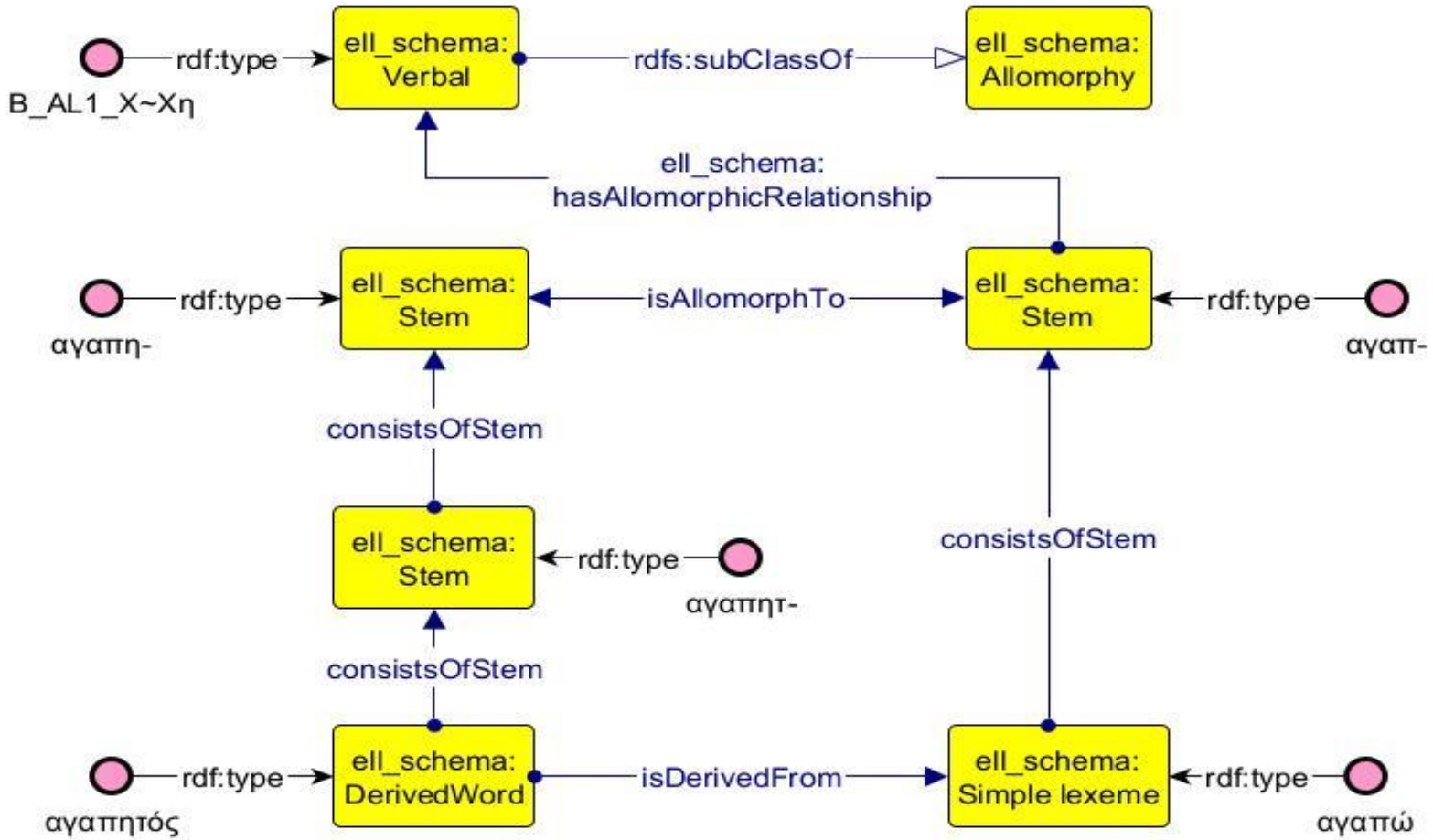
Allomorphy

- a **morpheme** (that is realized by a **morph**) has more than one form with the same **meaning** or **function**
- allomorphs stand in **complementary distribution** within words
- **stems** (bases or affixed bases) or **affixes** alone

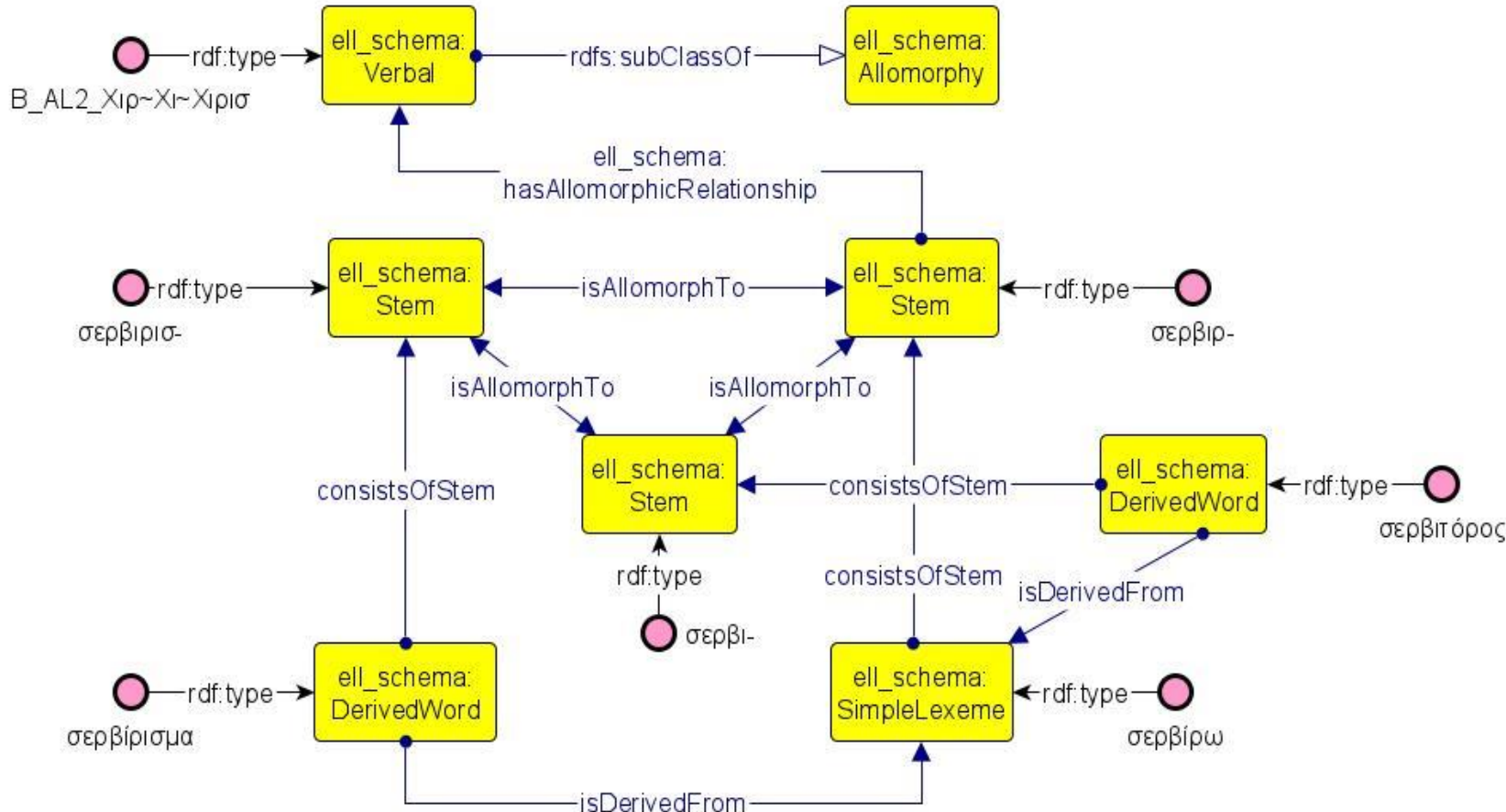
Allomorphy-Types

- Morpho-phonological e.g. κλεβ- (klev-) ~ κλεφ- (klef-) ~ κλεψ- (kleps-) of the verb κλέβ-ω (klev-o) ‘to steal’
- Morphological or Grammatical e.g. σώμα- (soma-) ~ σωματ- (somat-) of the noun σώμα (sóma) ‘body’
- Suppletion e.g. βλέπ-ω (vlép-o) ‘I see’ είδ-α (ίδ-α) ‘I saw’

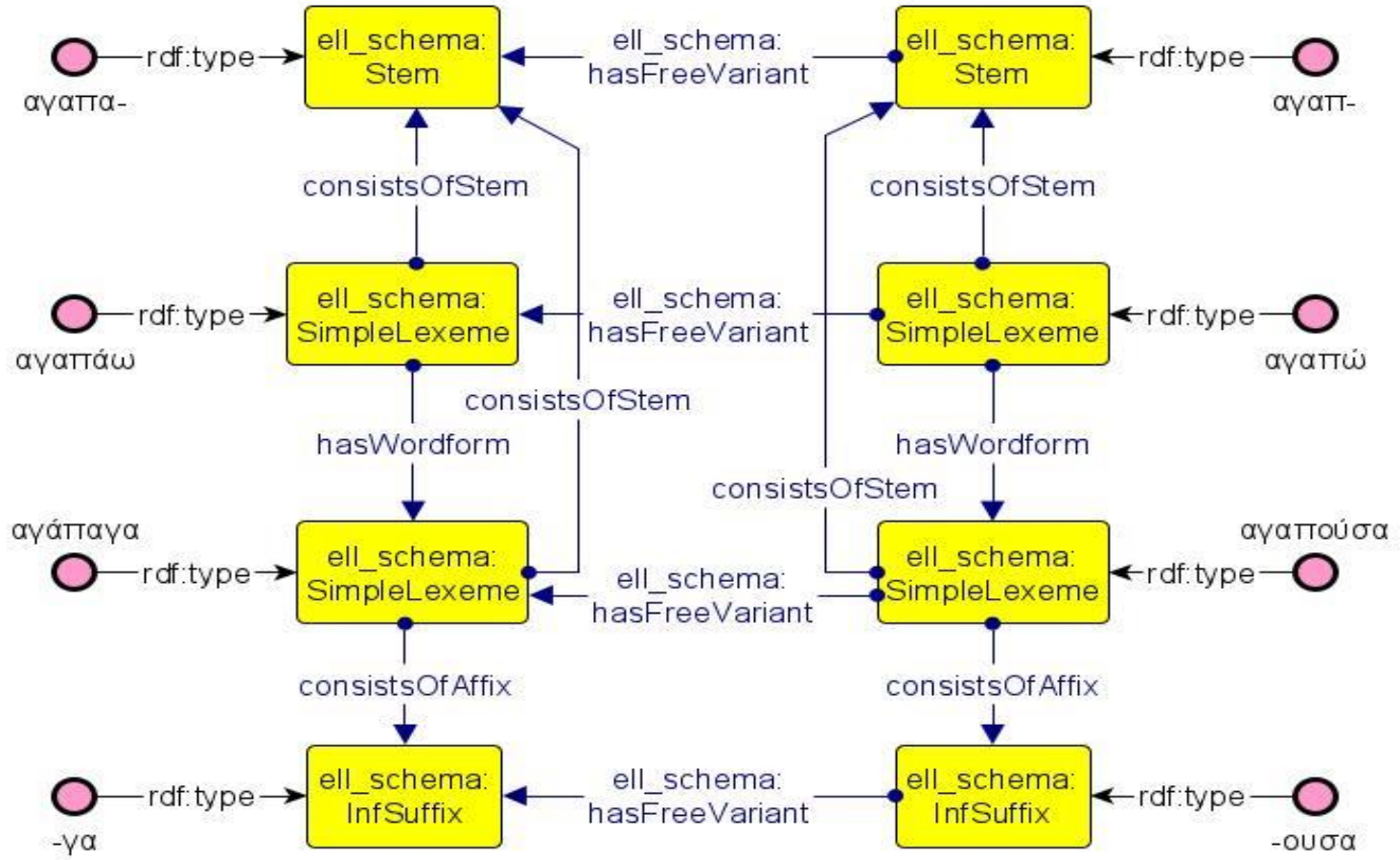
Allomorphy-Bases



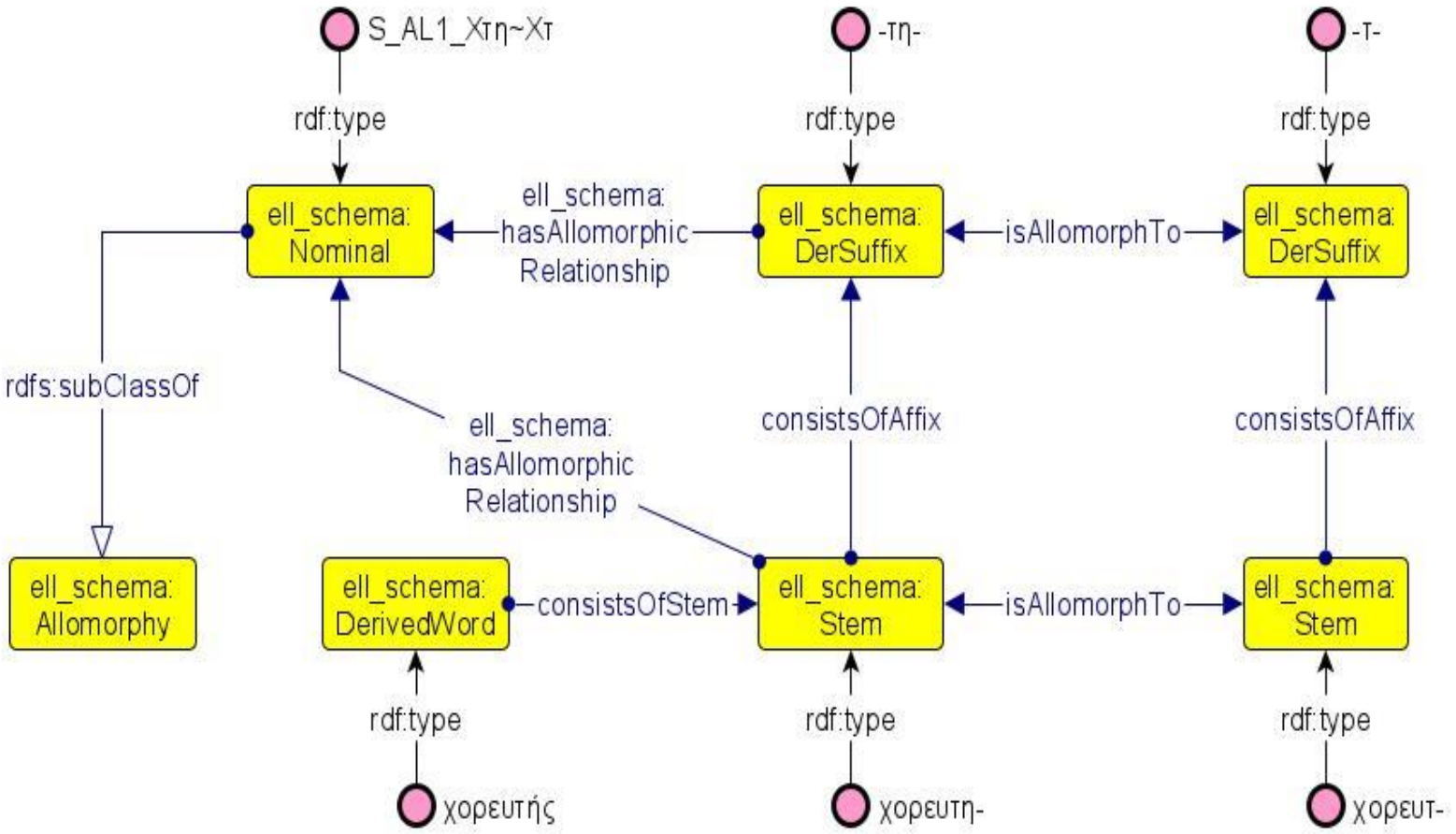
Allomorphy - Bases



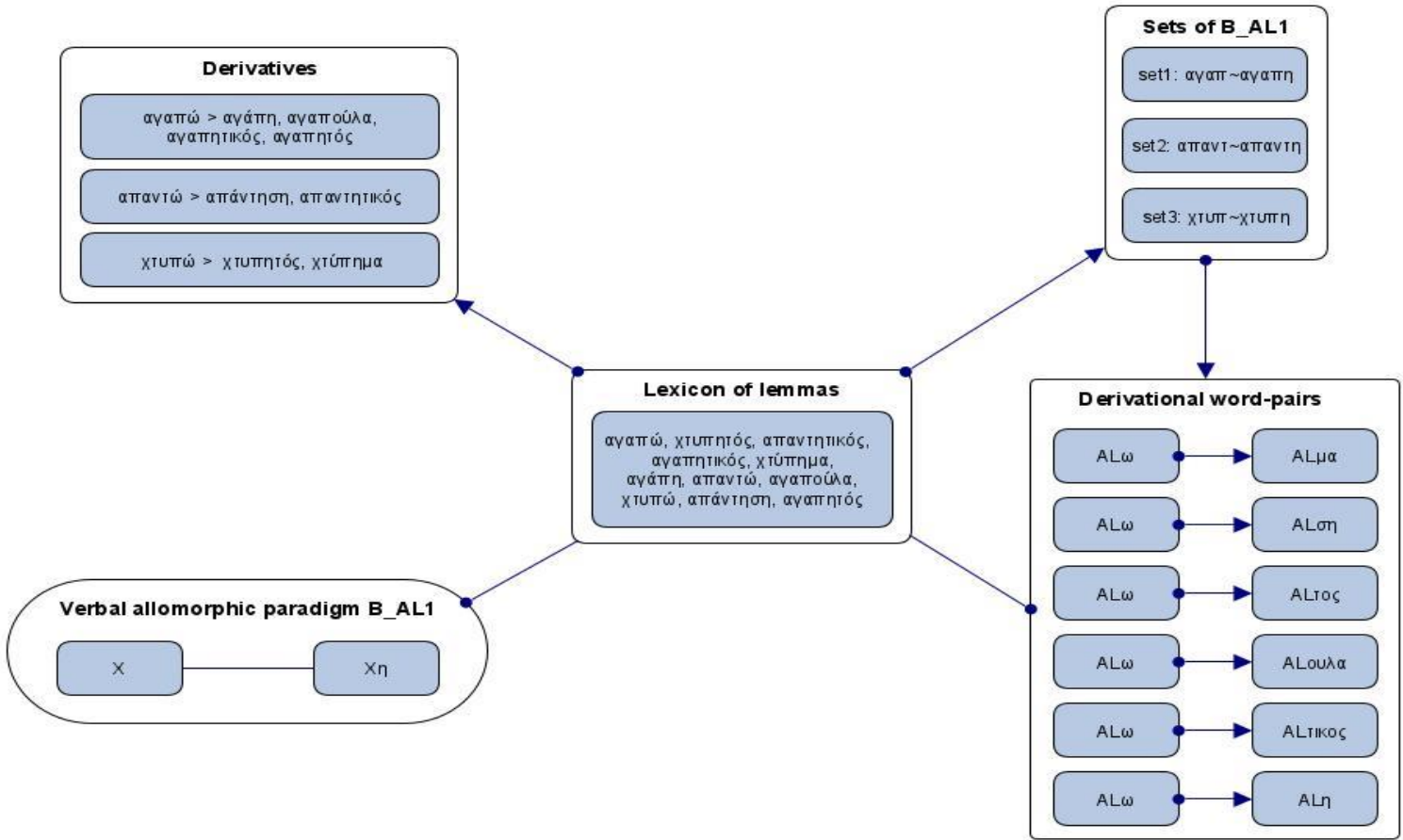
Allomorphy - Free Variants



Allomorphy - Affixes



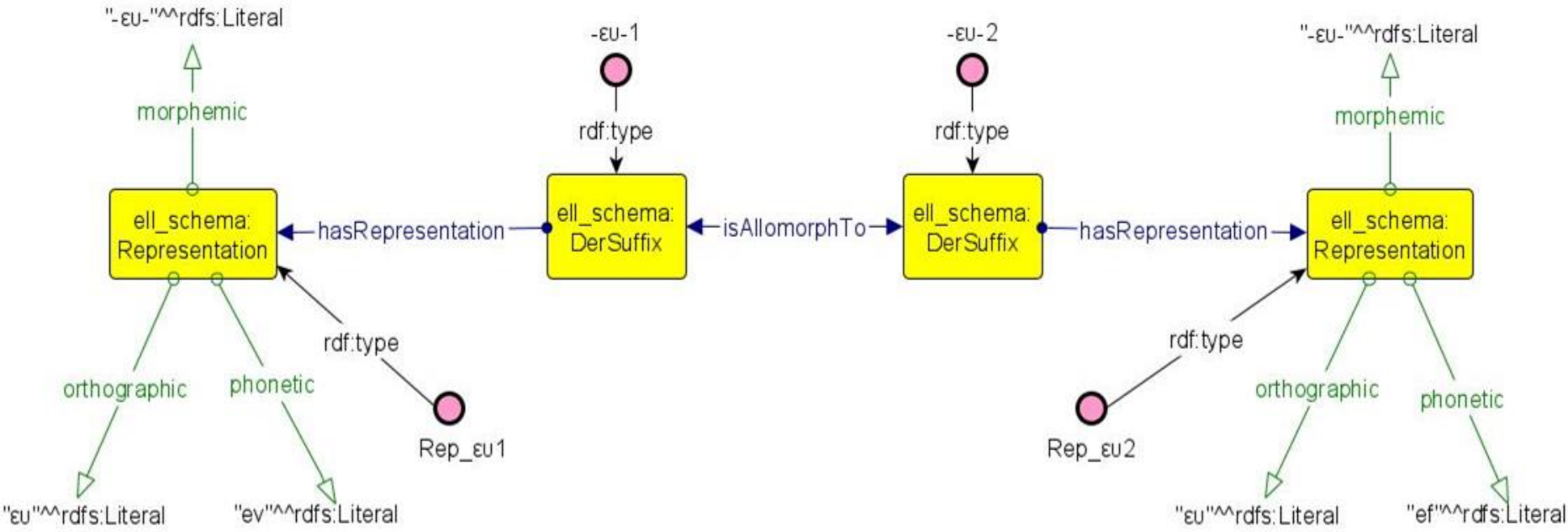
Allomorphy - Framework



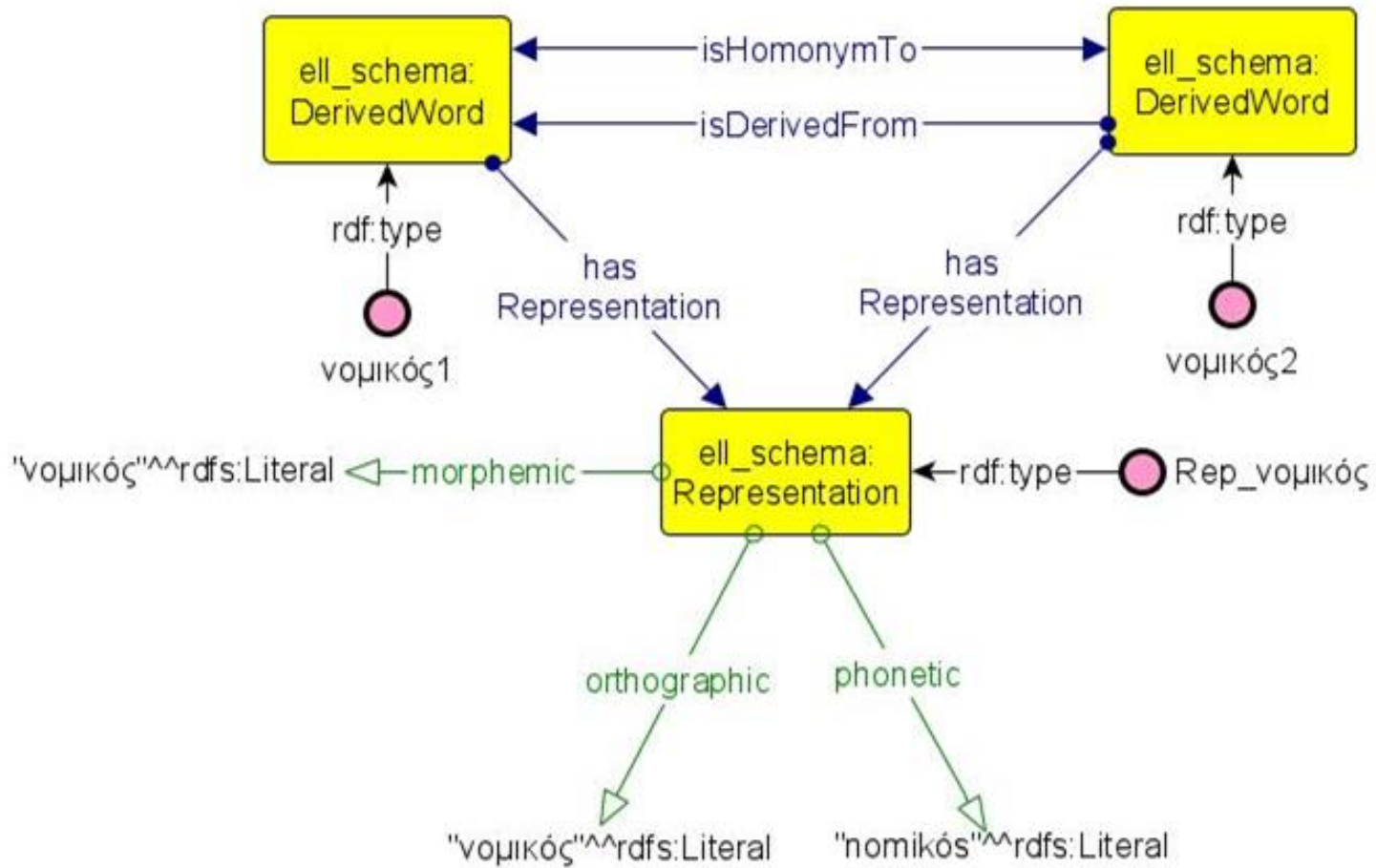
Representation

- morphemic
- phonetic
- orthographic

χορ-εύ-ω > χορ-ευ-τής



Representation



Future plans

- Import lexical data in the ontology to:
 - make **comparisons** between:
 - **morpheme- and word-based** approaches
 - **concatenation vs. templatic rules**
 - **layer- or semantic-based vs. form-based** morphology
 - **διαδρό > διαδρας-tik-ós vs. δια-δρας-t-ik-ós**
 - explore statistics and morph productivity
- Morphological semantics
 - **Lexical** e.g. agent, diminutive, degrading etc.
 - **Grammatical** e.g. category, gender, case etc.
- **Framework** pipeline for automatic ontology population
- **Interoperability** with *Ontolex Morphology Module* or other vocabularies
- Choices in **rule modeling** (allomorphy, derivational rules)

Thanks for your attention!
Questions?