Ontology of Rhetorical Figures for Serbian

Jelena Mitrović

Miljana Mladenović

University of Belgrade

Motivation

- As some **rhetorical figures** can be considered as **MWEs** this ontology can bring a new dimension to research and detection of MWEs which are very frequent in everyday language

Motivation

Some examples of **MWEs** in regard to rhetorical figures are:

1) **Oxymoron** – a rhetorical figure in which apparently contradictory terms appear in conjunction e.g. **Warm ice** (Topli led), **Living dead** (Živi mrtvac), **Loud silence** (Glasna tišina) etc.

Motivation

2) **Periphrasis** – the use of indirect and circumlocutory speech or writing, e.g. **Top of the World** (Vrh sveta) to describe the Himalayas, **The Big Apple** (Velika jabuka) for New York, **The City of Lights** (Grad svetlosti) for Paris etc.

Ontology

In general:

- **Ontology is a model that represents knowledge.**

More specific:

- **An ontology is a set of concept definitions and relationships that exist among them.**

Formal ontology

In general:

- **Formal ontology is an ontology defined by axioms in a formal language.**

More specific:

- **Formal ontology is a systematic, formal, axiomatic development of the logic of all forms and modes of being.**

Describing the world with ontology

According to the degree of generality

Upper level (top-level) ontologies provide:

- general concepts which are common to more domains (a broader view of the world).
- a common ontological foundation for domain ontologies.

Examples: CYC, WORDNET, DOLCE, SUMO, BFO, GFO

Domain ontologies (or domain-specific ontologies) are models of specific domains (parts of the world).

Examples: GOLD, CHEMICALS

Ontology structure

The most widely used ontology model consists of five components:

- **Classes** – concepts that represent entities in a domain that the ontology models. Also, they are collections of individuals.
- **Individuals** – Instances of concepts (classes)
- **Relations** – connection between classes and individuals of a particular domain
- **Attributes** – properties, features, characteristics, or parameters that classes and individuals can have
- **Restrictions** – sentences that are always true. For verifying the consistency of an ontology and the consistency of the knowledge base.

Using formal ontologies

In linguistics:

- **standardized corpora markup,**
- **annotation mapping to ontology layers,**
- **analysis of discourse structures,**
- **natural language processing based on Semantic Web technologies, etc.**

RetFig

- **RetFig** is a linguistic domain, descriptive, formal ontology for rhetorical figures in Serbian.
- It was created in **Protégé 4.2** - ontology editor using the **OWL 2** Web Ontology Language
- top-down modelling technique was used.
- It is the first ontology for that purpose in Serbian.
- It describes **98** figures.

RetFig

ROLES:

- a formal domain ontology that unambiguously describes and defines rhetorical figures in Serbian;
- to be shared and merged with other linguistic resources and ontologies, such as the Serbian WordNet (SWN), the Princeton WordNet (PWN) and Suggested Upper Merged Ontology (SUMO);
- to represent the basis upon which a task ontology will be built and used in processes of ontological annotation of rhetorical figures in Serbian.

Rhetorical figures

We use rhetorical figures (rhetorical devices, stylistic figures or figures of speech):

- **to convince the public**
- **to express personal feelings**
- **to give a different view on fact**
- **to amuse the auditorium**

Important segment of opinion mining.

Rhetorical figures

Example:

"***He is as fast as light*** " – positive opinion

"***He is as fast as a turtle***" – negative opinion

Rhetorical figures classification in RetFig ontology

4 rhetorical categories:

- **figures of pronunciation -** stressing some of the letters, syllables or words in the sentence; don’t change the literal meaning of a statement;
- **figures of construction -** uncommon grammatical order of words in the sentence; don't change the literal meaning of the sentence;
- **figures of meaning (tropes) -** change the meaning of certain words, collocations or phrases in the sentence
- **figures of thoughts -** change literal meaning or give multiple meanings of a linguistic structure greater than a sentence.

Rhetorical figures classification in RetFig ontology

5 linguistics categories (depending on the linguistic elements which participate in the creation of a rhetorical figure):

- **phonological -** linguistic elements participating in the creation are letters or groups of letters or syllables;
- **morphological -** created by using of Inflectional forms of a word, lexemes, or by using of word formation;
- **syntactic -** changed ordinary linguistic order of words in a sentence;
- **semantic -** change literal meaning of a phrase or sentence;
- **pragmatic -** change of literal meanings spreads on context of more sentences.

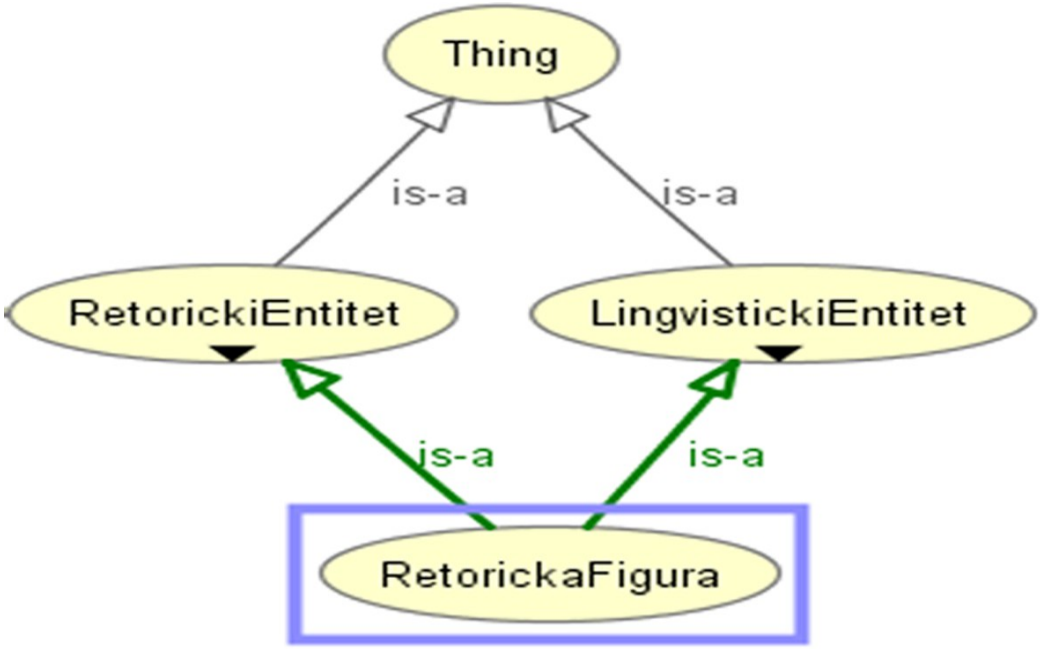
Rhetorical figures classification in RetFig ontology

7 linguistic operations on linguistic elements:

- **addition –** add a letter, syllable, word or phrase
- **omission –** omit a letter, syllable, word or phrase
- **repetition –** repeat a letter, syllable, word or phrase
- **transposition –** transpose a letter, syllable, word or phrase
- **joining –** join letters, syllables, words or phrases
- **separation –** separate syllable, word, phrase or sentence
- **symmetry–** create symmetric syllable, word, phrase or sentence structure**.**

Creation of the RetFig ontology

The concept „RhetoricalFigure“ (“RetorickaFigura“) is defined in RetFig ontology as both a rhetorical and a linguistic concept. We defined those relations conceptually:



Creation of the RetFig ontology

- **Linguistic range**
- **Linguistic object**
- **Linguistic operations**

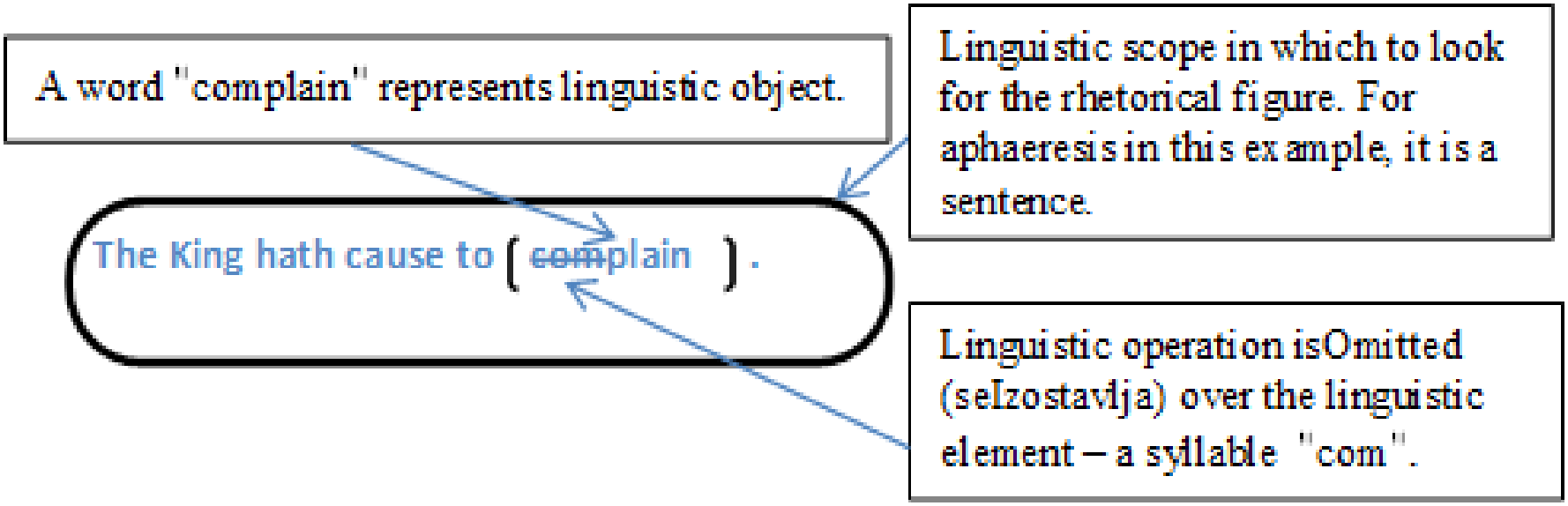
- The transformation processes are either done over the entire linguistic object or over a part of that object.
- **Linguistic elements –** parts of linguistic objects that are being transformed.

Creation of the RetFig ontology

Detection of Aphaeresis (Afereza) by RetFig

The given example is taken from Shakespeare's "King Lear" –

"The King hath cause to plain."



Creation of the RetFig ontology

Mutual relationship between **linguistic objects** and **linguistic elements** makes differences between the figures themselves.

For example, if a linguistic object is a **word**, linguistic element is a **letter**, and a linguistic operation is "**leter omission**", than we could have:

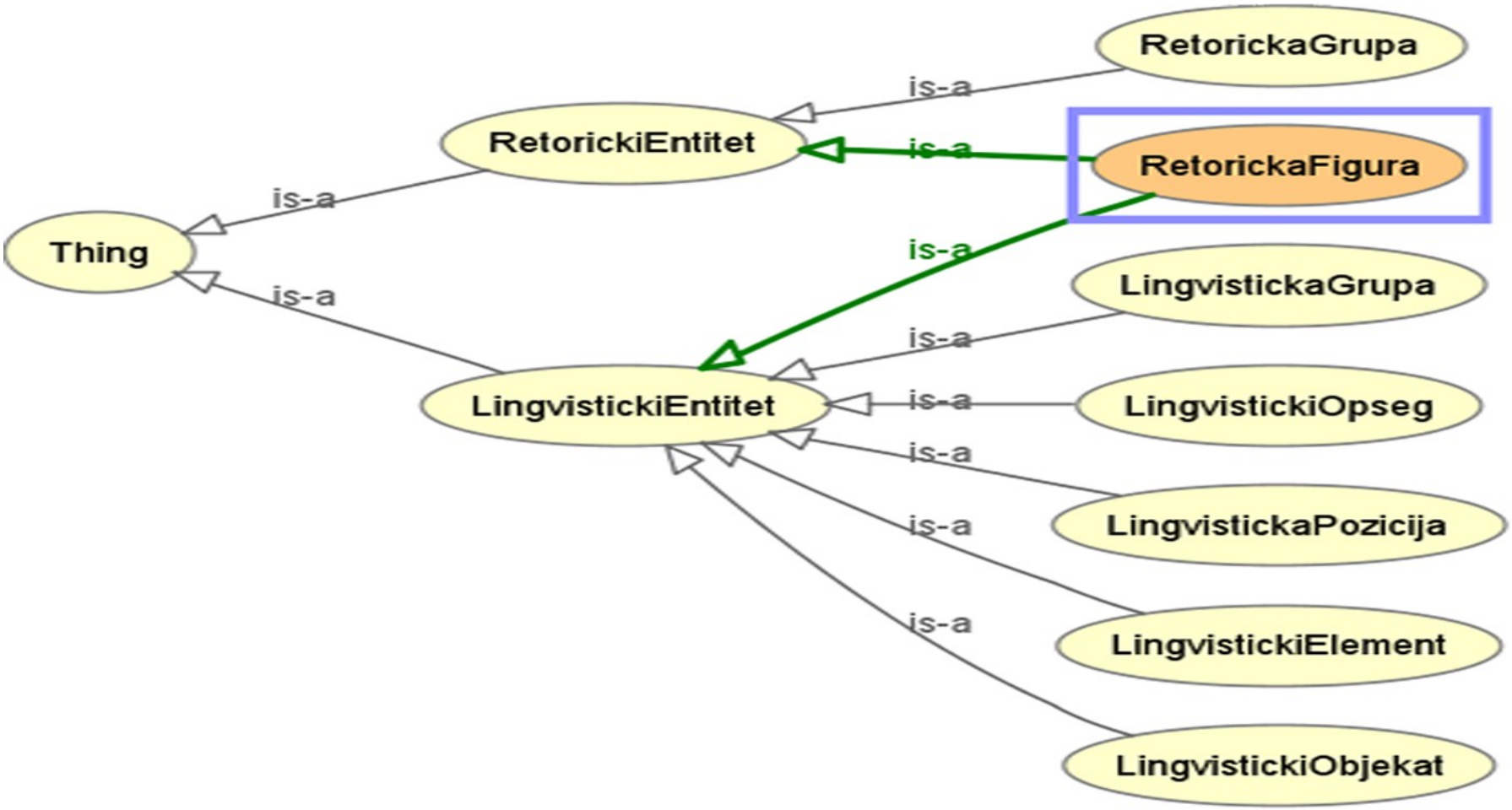
- rhetorical figure ***aphaeresis*** (afereza), if an omitted letter is the first letter in the word
- rhetorical figure ***apocope*** (apokopa), if an omitted letter is the last letter in the word
- rhetorical figure **syncope** (*sinkopa*), if an omitted letter is between the first or the last position in the word to which it belongs.

Creation of the RetFig ontology

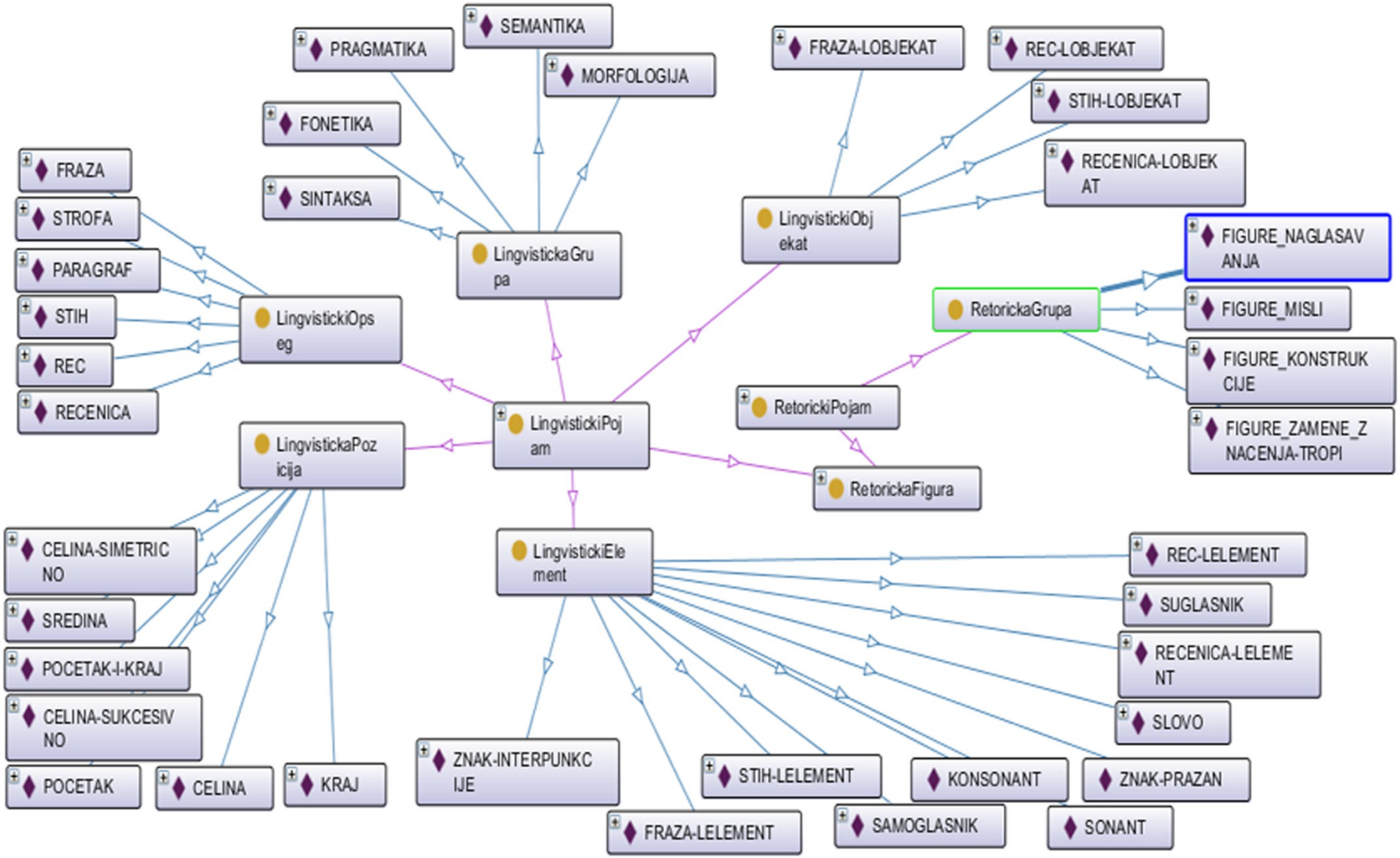
Linguistic concept is represented by classes:

- **LinguisticObject(“LingvistickiObjekat“)**
- **LinguisticRange(“LingvistickiOpseg“)**
- **LinguisticPosition(“LingvistickaPozicija“)**
- **LinguisticElement(“LingvistickiElement”)**
- **RhetoricalFigure(“RetorickaFigura“)**

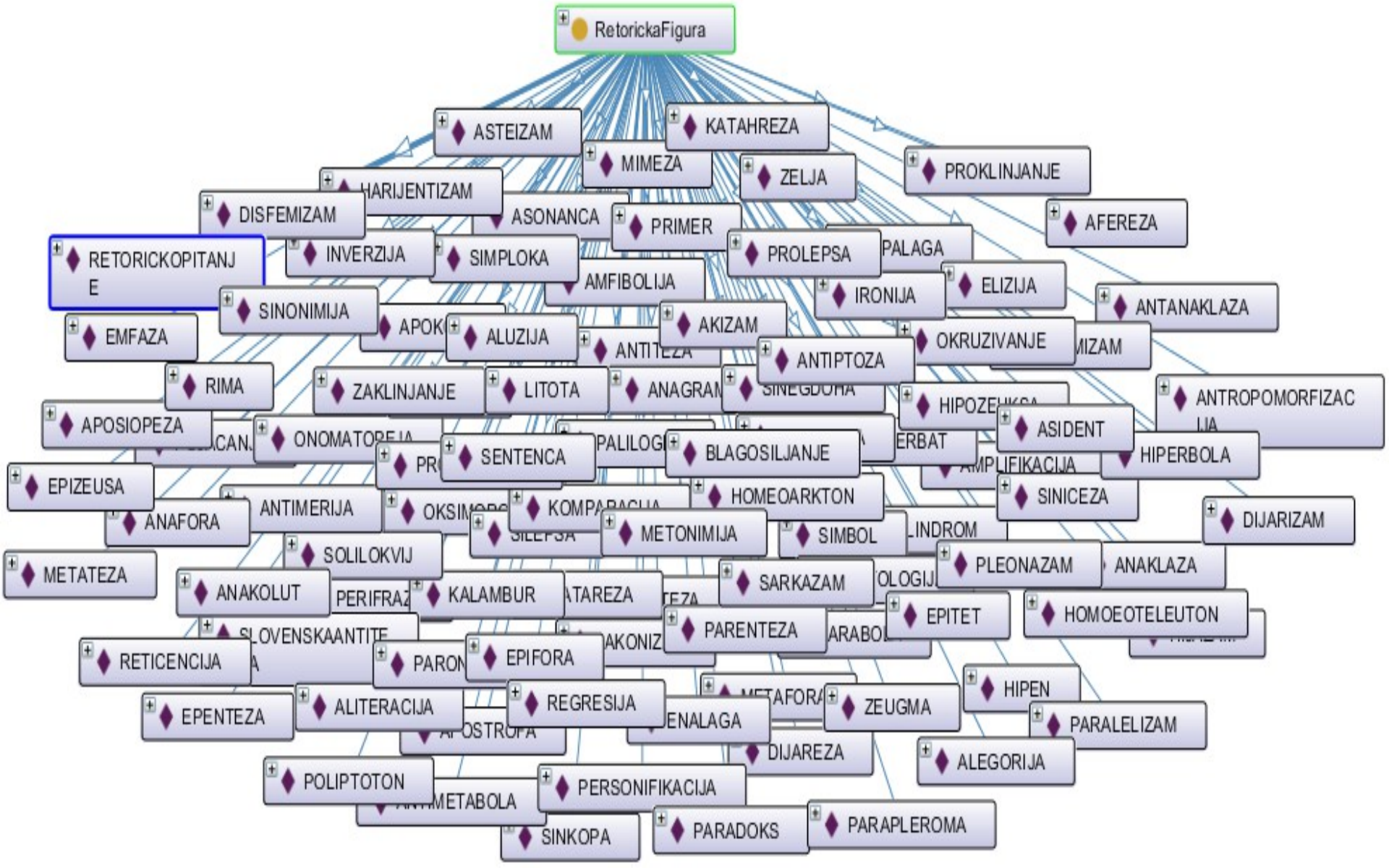
RetFig- Taxonomy of linguistic and rhetorical concepts



RetFig- Individuals

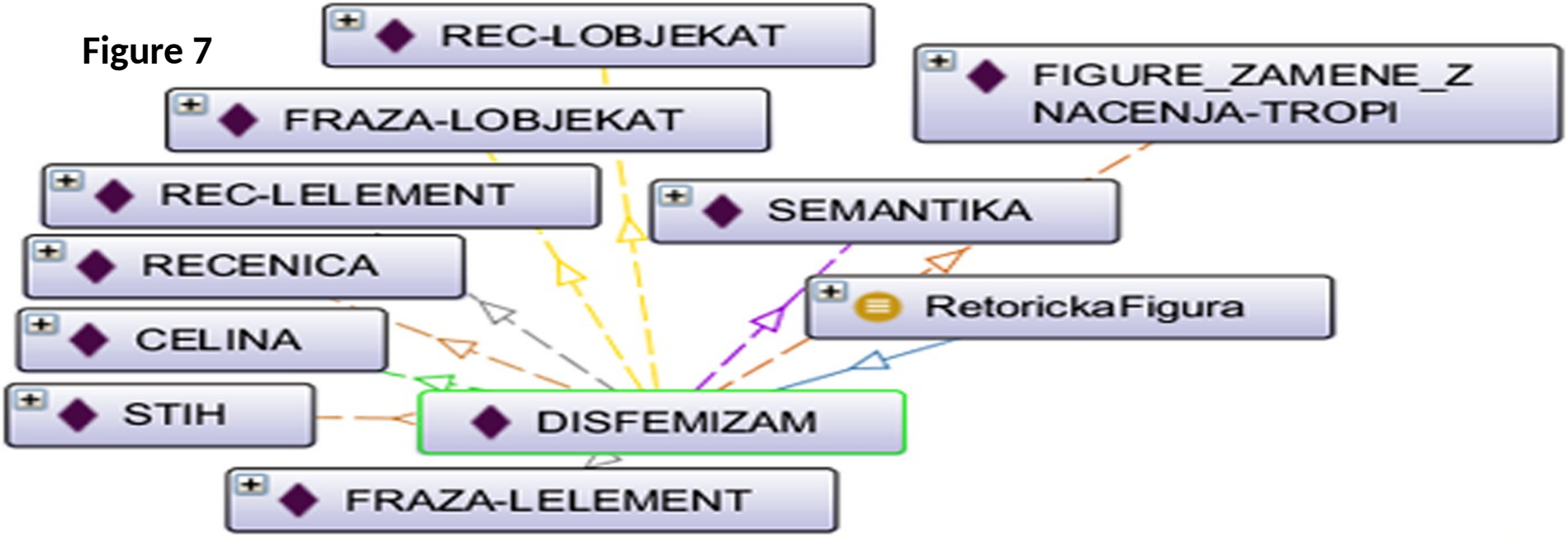


RetFig- rhetorical figures individuals



RetFig- Dysphemismus definition

Figure 7



DISFEMIZAM jeLingvistickaGrupa SEMANTIKA
DISFEMIZAM jeNaPoziciji CELINA
DISFEMIZAM jeNadOpsegom STIH
DISFEMIZAM jeNadObjektom FRAZA-LOBJEKAT
DISFEMIZAM jeNadObjektom REC-LOBJEKAT
DISFEMIZAM seZamenjujeDrugimElementomJacegZnacenja REC-LELEMENT
DISFEMIZAM seZamenjujeDrugimElementomJacegZnacenja FRAZA-LELEMENT

Data property assertions:

DISFEMIZAM naziv "DISFEMIZAM"^^string

Annotations:

seeAlso "dysphemismus"@en
comment "Namerno korišćenje ružnijeg, oštrijeg izraza umesto normalnog."
seeAlso "KAKOFEMIZAM"@sr

RetFig- a rhetorical figure in details

An example for the definition in **RetFig** ontology of rhetorical figure **Dysphemismus** (Disfemizam)

From the given example, complete information on **Dysphemismus** (Disfemizam) can be obtained.

- This figure presents **usage** of an intentionally harsh word or expression instead of an expected, or a polite one.
- We also find that **the name** of this figure in English is *Dysphemismus*, and that there is also an **alternative name** for this figure in Serbian – *Kakophemismus* (*Kakofemizam)*.
- *Disfemizam* is a rhetorical figure from the rhetorical group named **tropi** (**tropes**).
- It is a subject of research for the area of linguistics called **Semantika** (**Semantics**).
- It can be found inside a sentence or a verse (**linguistic scope**) and it is formed by replacing the excisting phrase or a word (**lingvistic object/element**) in the sentence (**linguistic position**) by a different phrase or a phrase or a word of a stronger meaning (**linguistic operation - „seZamenjujeDrugimElementomJacegZnacenja“**).

RetFig- serialization

- RetFig can be serialized into XML.

- Building a knowledge base with examples

For ***Disphemismus***, the phrase „*on je umro*“ (he died) is being replaced by a phrase of stronger, more harsh meaning – „*on je već hrana crvima*“ (he is already worm food).

RetFig- serialization

```
<RETFIG>
    <figure>
        <id>4963449e-182f-44ad-a4ac-0c2d8f3efb12</id>
        <name> DISFEMIZAM (KAKOFEMIZAM)</name>
        ...
        <examples>
            <example>On je već hrana crvima</example>
            <example>Automatski  foto aparat - idiot</example>
            <example> Ta džukela laje po ceo dan. (džukela - pas)</example>
            <example> On ne prestaje da loče iako mu je doktor zabranio. (loče -
            pije, konzumira alkohol </example>
        </examples>
    </figure>
...
</RETFIG>
```

Figure 8

RetFig- serialization

```
<RETFIG>
    <figure>
        <id>79684247-404e-4aee-baeb-aeafa4e5bdb3</id>
        <name>AFEREZA</name>
        <engname>aphaeresis</engname>
        <description>Izostavljanje jednog ili više slova na početku reči (obično “h”).
        </description>
        <etymology>gr. apo- udaljiti, hairein- uzeti</etymology>
        <notice></notice>
        <rhettype> Figure konstrukcije</rhettype>
        <lingtype> Fonološki</lingtype>
        <lingops>Izostavljanje</lingops>
        <examples>
            <example>
            oću..(hoću), • leba..(hleba), • tedoh..(htedoh) • ajduk (hajduk) • pele (cipele)
            </example>
        </examples>
    </figure>
...
</RETFIG>
```

RetFig- ontology testing

First – for a given "linguistic range" and/or "linguistic object" of observation in an NLP process, **RetFig** ontology gives possible candidates for a certain rhetorical figure.

For example, rhetorical figures which are made in "linguistic scope" defined by an individual "*REC*" ("word").

RetFig- ontology testing

Find the rhetorical figures generated over words

SPARQL query:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX ont: <http://www.mmiljana.com/ontologies/ont.owl#>
SELECT DISTINCT ?figura
 WHERE {        ?figura ont:jeNadOpsegom ?opseg.
                ?opseg ont:naziv ?nazivOpsega.
                        FILTER( ?nazivOpsega ="REC") }
```

figura
SIMBOL
PROTEZA
PERIFRAZA
AFEREZA
ANAGRAM
EPENTEZA
DIJAREZA
METATEZA
APOKOPA

RetFig- ontology testing

Second – RetFig ontology identifies rhetorical figures in text according to observed text properties. For example, if we determine that the analysis of a certain text shows a frequent loss of letters in words, mapping onto the ontological relation "*seIzostavlja*" (isOmmited) gives us a set of rhetorical figures that are formed that way, by omission of letters. Those figures are: aphaeresis (afereza), syncope (sinkopa), apocope (apokopa) and ecthlipsis (elizija).

RetFig- ontology testing

Find rhetorical figures formed by omission of letters in words

SPARQL query:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX ont: <http://www.mmiljana.com/ontologies/ont.owl#>
SELECT DISTINCT ?figura
 WHERE {       ?figura ont:selzostavlja ?element.
               ?element ont:naziv ?naziv.
                        FILTER( ?naziv ="SLOVO") }
```

figura
ELIZIJA
APOKOPA
SINKOPA
AFEREZA

Rhetorical Figures – MWEs

- Anacoluthon
- Anadiplosis
- Anagram
- Antimetabole
- Antistrophe
- Apostrophe
- Epistrophe
- Eulogy
- Metonymy
- Oxymoron
- Palindrome
- Parallelism
- Parenthesis
- Paronomasia
- Periphrasis

Examples

- German “**Klar wie Klosbrühe**" (lit. Clear like dumpling broth)

- “**Gespannt wie ein Flitzebogen**" (lit. Streched like an arrow) but idiomatically: "very excited, in expectation")

RetFig

- RetFig ontology can be downloaded from the address of the web application http://resursi.mmiljana.com/RetFigS.aspx

- After simple authentication, **.xml** and **.owl** files can be downloaded

Shared (sub)tasks?

- Building parallel resources
- A knowledge base for MWEs based on ontologies
- Multilingual ontology of relevant rhetorical figures
- A framework with wordnets containing MWEs

Shared (sub)tasks?

- Connection with Construction Grammar research or
- Formulaic language research

- This ontology can be used for many other languages, with minor adaptations related to particular rhetorical figures

THANK YOU!