

Ambiguities in representing thesauri using extended SKOS

Examples from real life

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TPDL – 2012-09-27 – NKOS workshop

- Concept hierarchies

- hierarchical relationships between concepts vs. grouping concepts

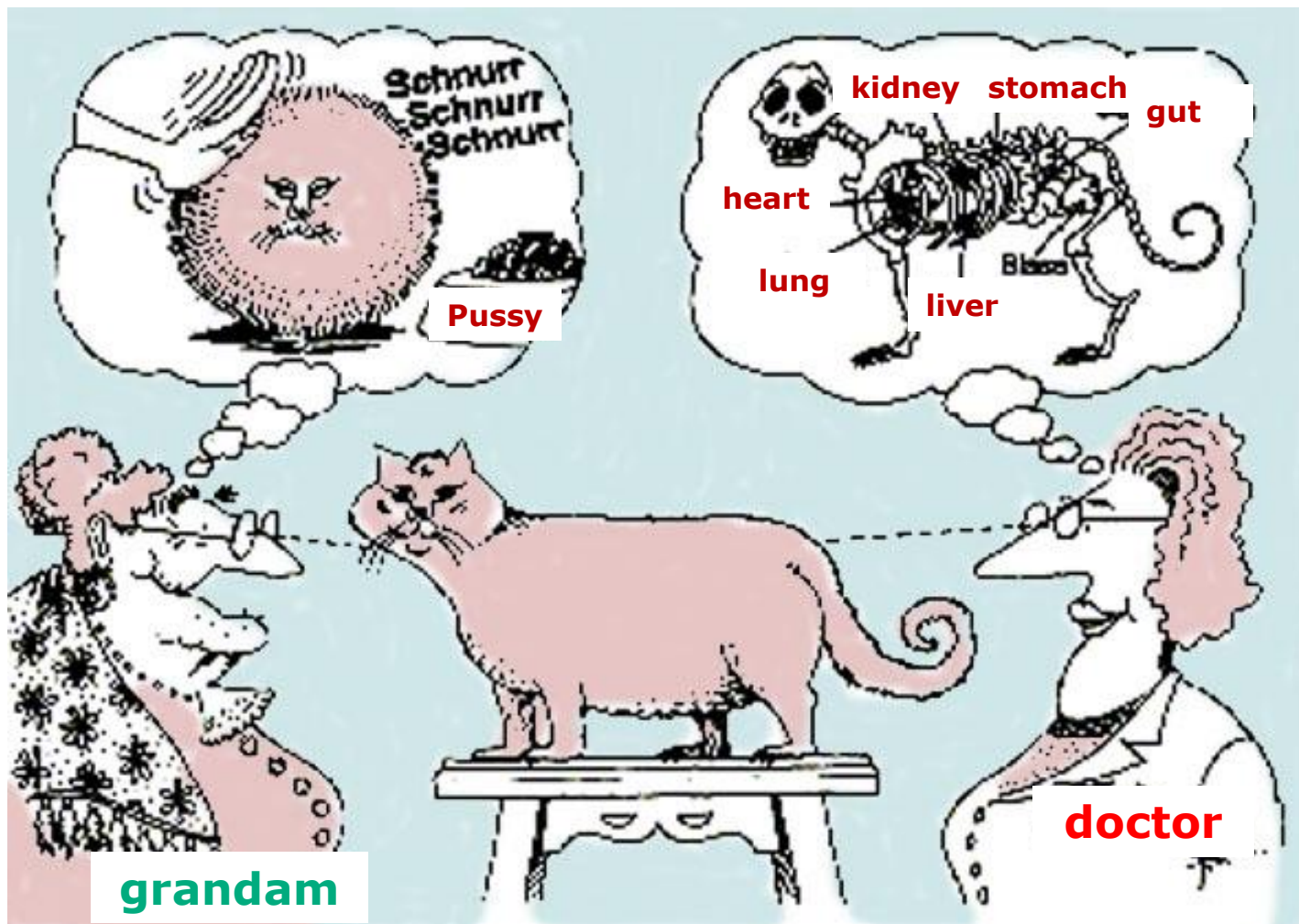
- Node Labels and Top Terms

- node labels in the strict sense: denoting arrays of sibling concepts
 - nodes representing concepts not used for indexing
 - nodes representing classification-like elements not used for indexing
 - top terms used to cluster concepts

- Groups

- classification-like structures, often called themes, fields, subject areas, subject categories, subject groups, micro-thesauri, sub-thesauri, and the like
 - often used for systematic display and browsing

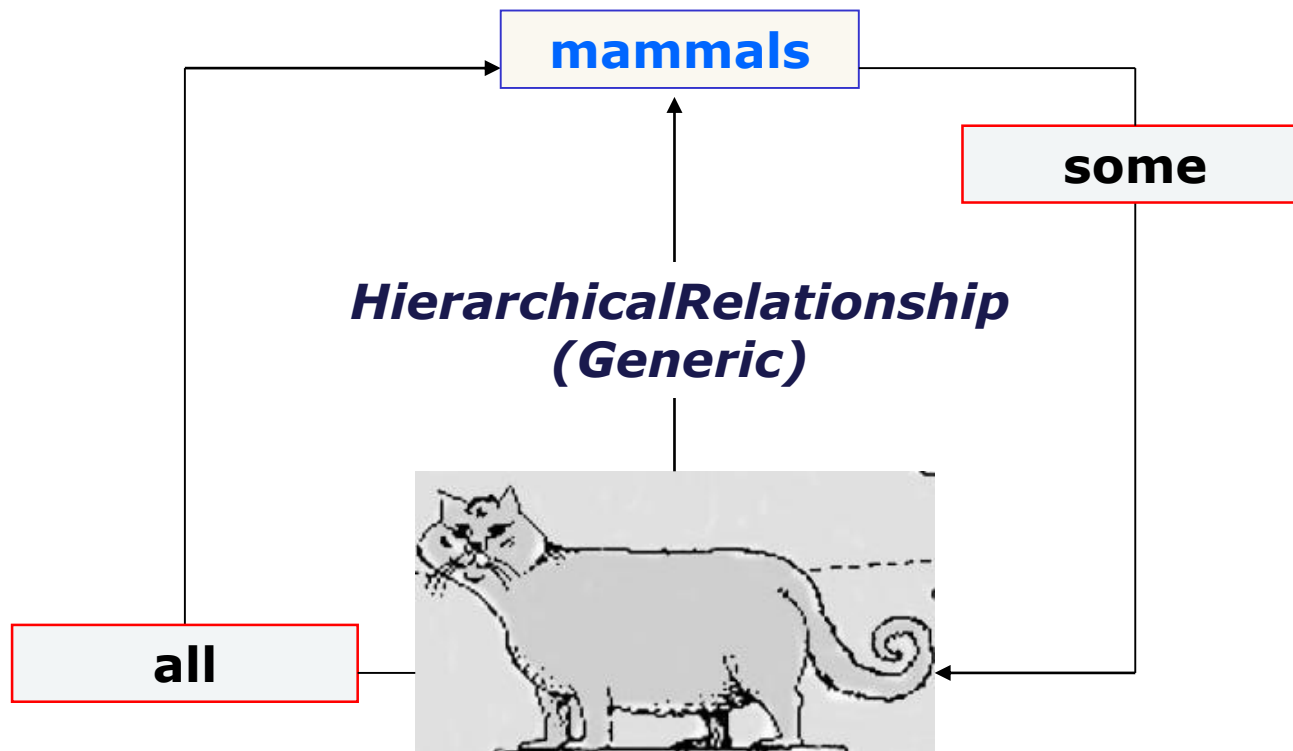
- Displays and user interfaces



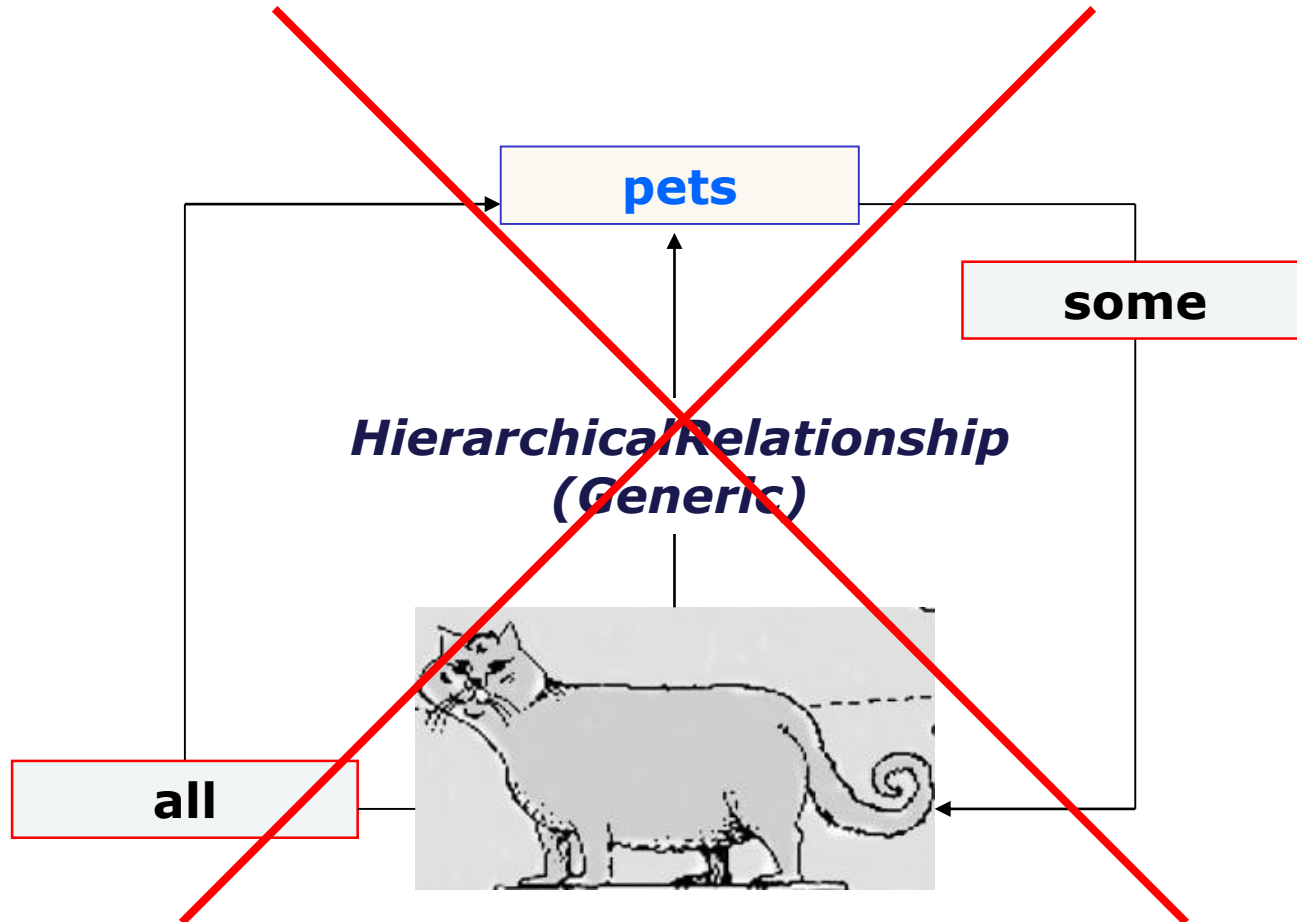
Beauty is in the eye of the beholder ...

Concept hierarchies

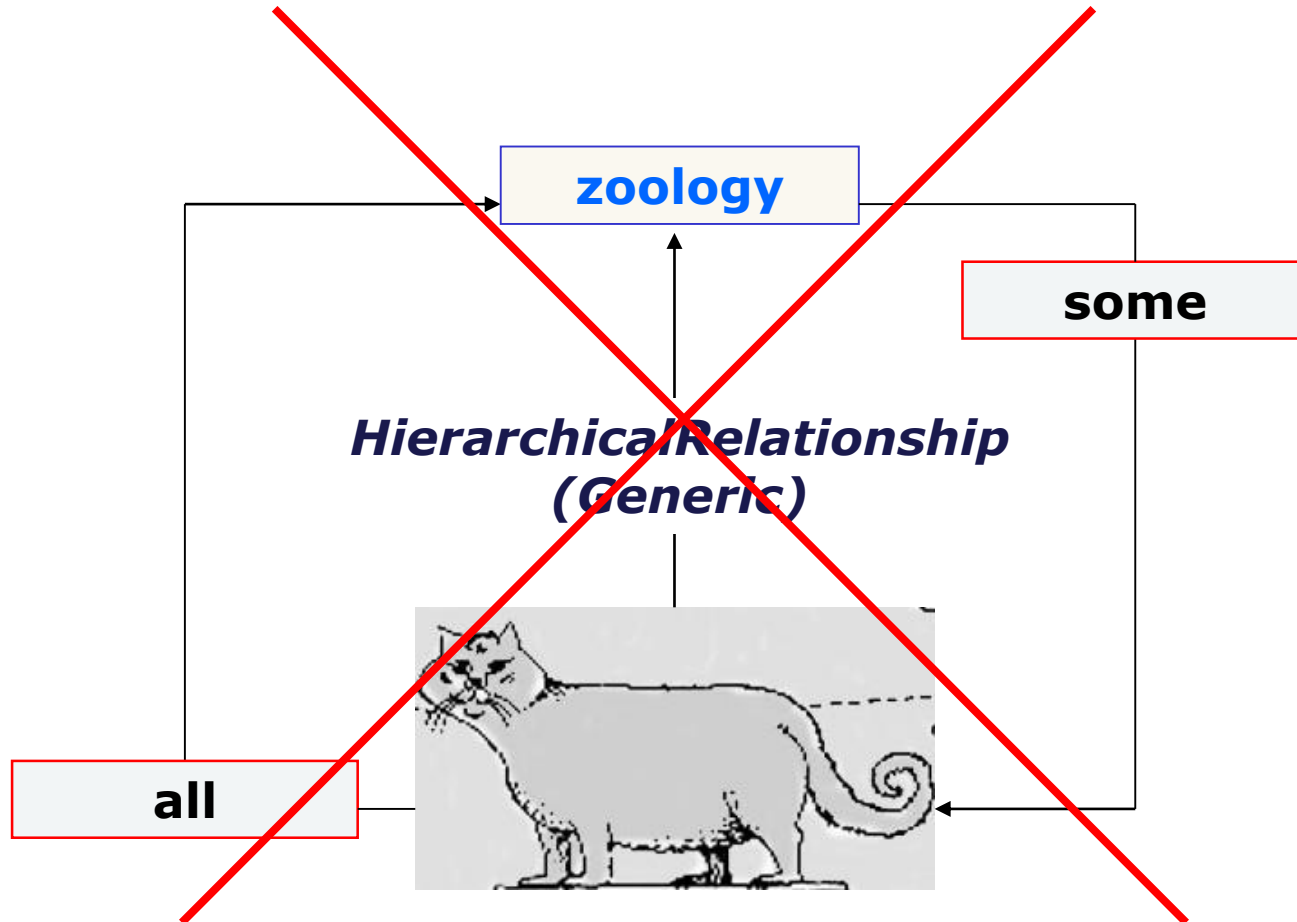
Concept hierarchy – All-and-some-test



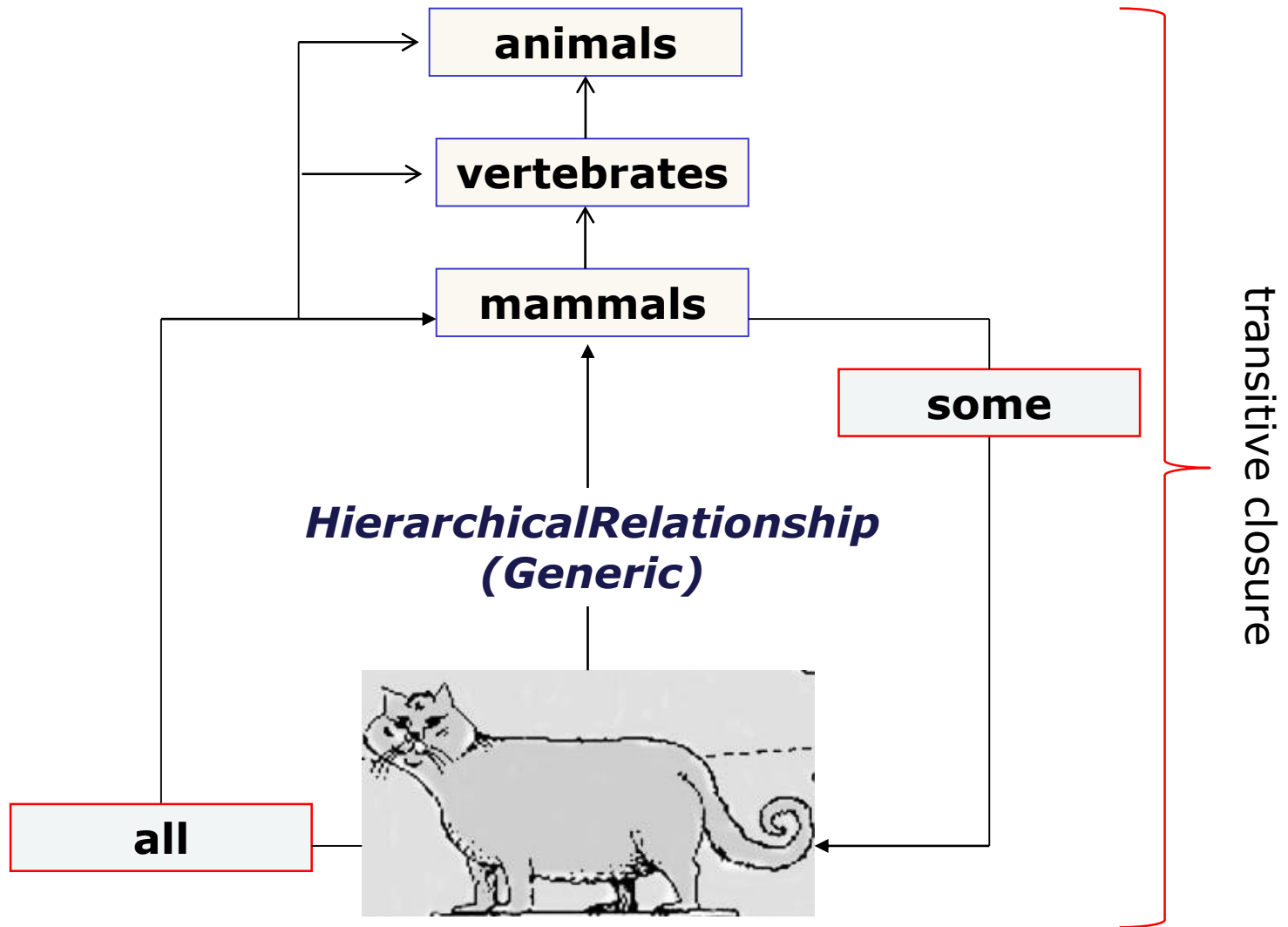
Concept hierarchy – All-and-some-test



Concept hierarchy – All-and-some-test



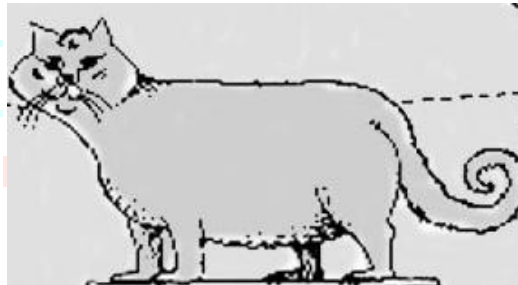
Concept hierarchy – transitive closure



Concept hierarchy and thesaurus arrays

Generic Hierarchy

.... Agents Facet
..... Living Organisms
..... Eukaryota (domain)
..... Animalia (kingdom)
..... Chordata (phylum)
..... Vertebrata (subphylum)
..... Mammalia (class)
..... Carnivora (order)
..... Felidae (family)
..... Felis (genus)
..... Felis domesticus (species)



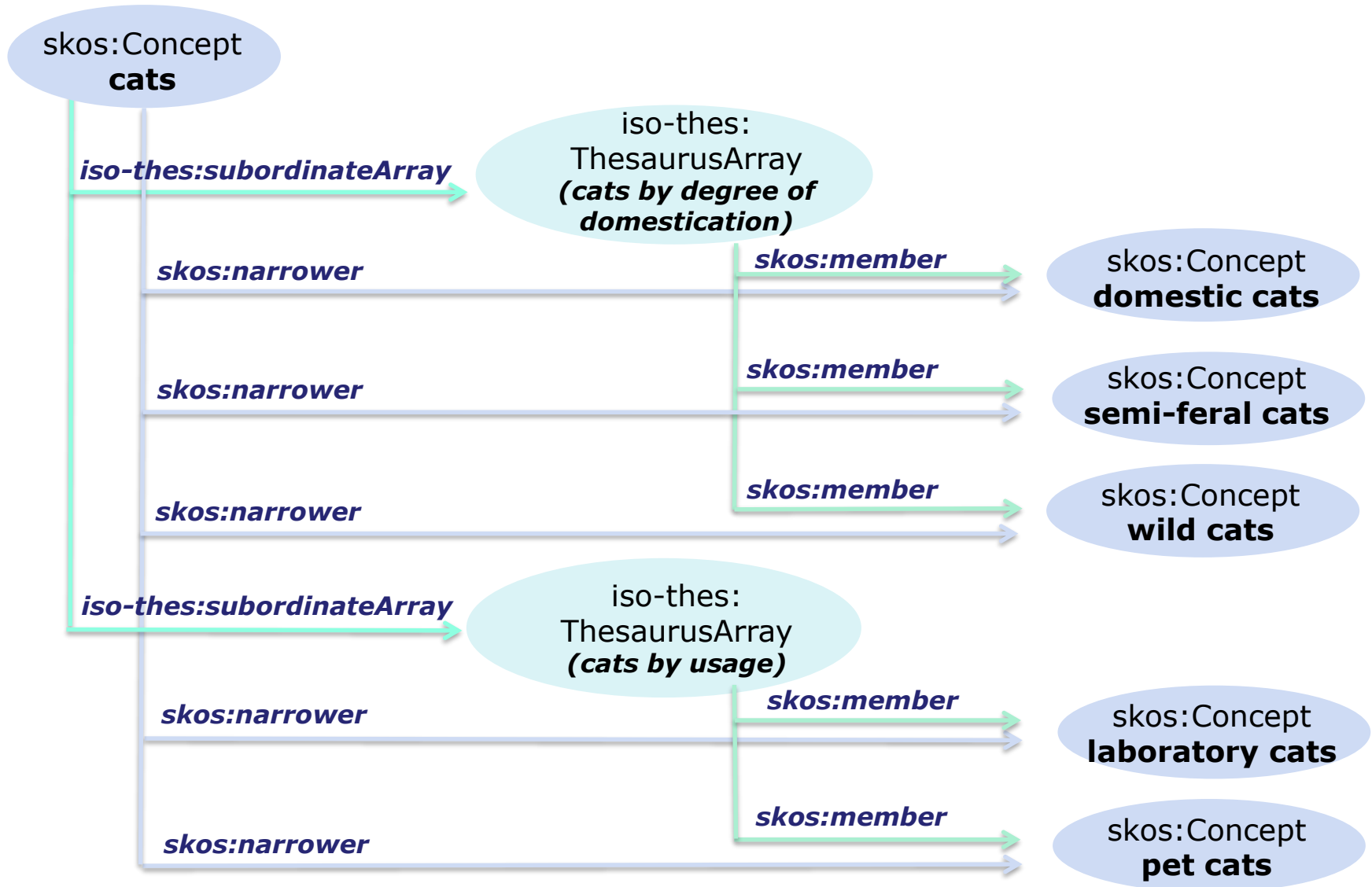
Source: [Art & Architecture Thesaurus](#)

ThesaurusArray

cats

- . *(cats by degree of domestication)*
 - .. wild cats
 - .. semi-feral cats
 - .. domestic cats
 - . *(cats by usage)*
 - .. laboratory cats
 - .. pet cats
- array** <ordered>
- node label**
- array**

ThesaurusArray and NodeLabel according to ISO 25964-1

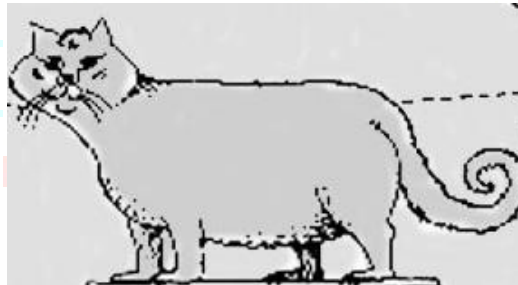


Concept hierarchy and concept groups

Generic Hierarchy

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..... Felidae (family)
..... Felis (genus)
..... Felis domesticus (species)

Source: [Art & Architecture Thesaurus](#)



ConceptGroup

25 Zoology

25.3 Spezific

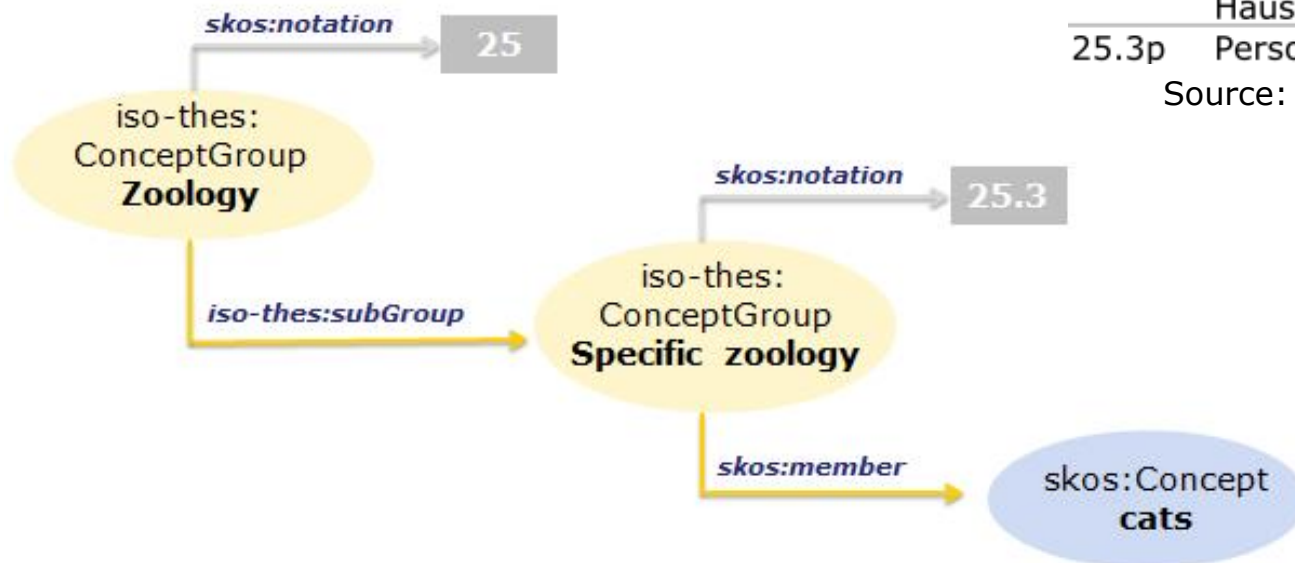
zoology

Source: [Gemeinsame Normdatei](#)

Concept groups according to ISO 25964-1

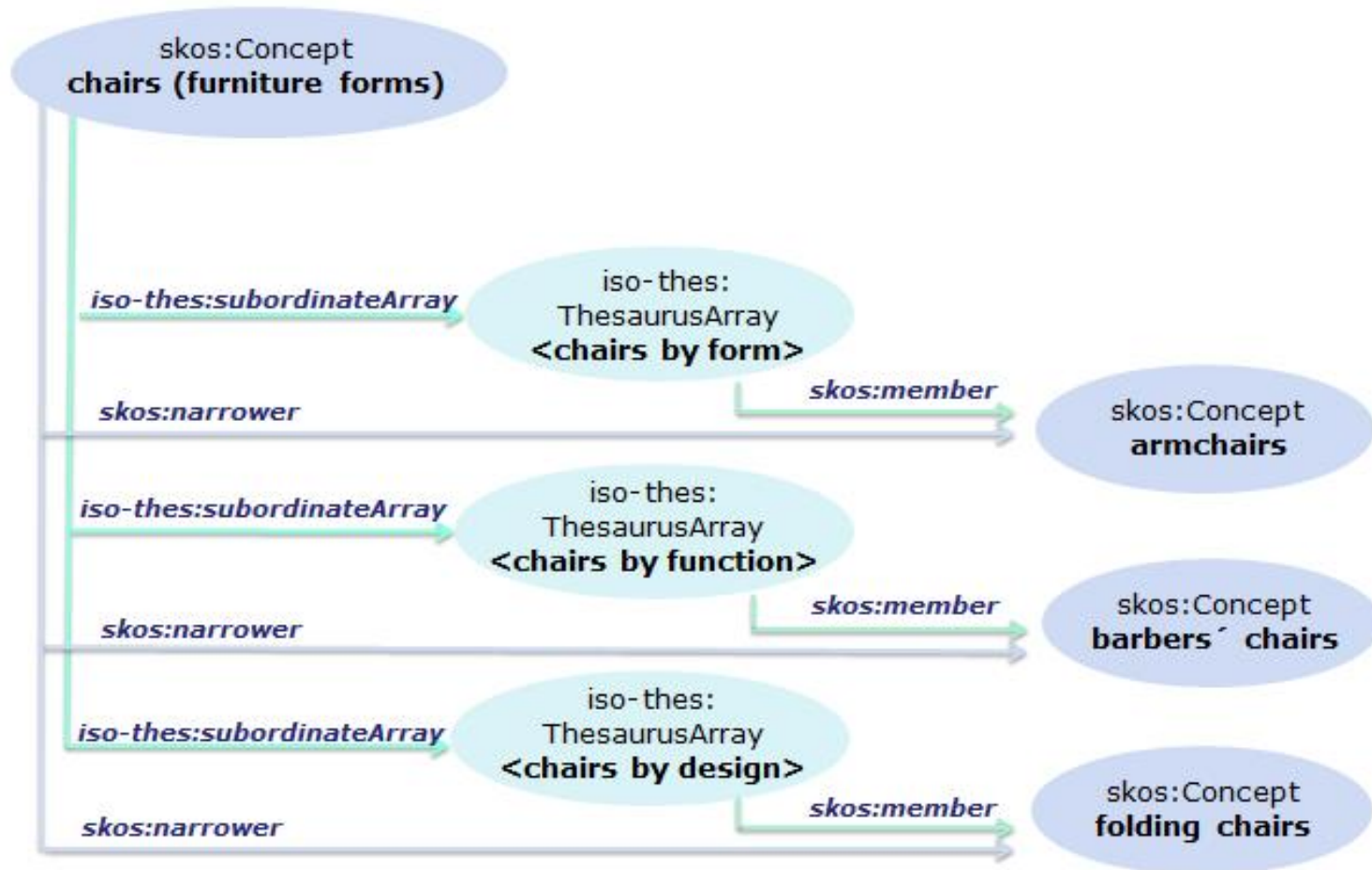
25*	Zoologie
25*	Zoologie
25.1	Zoologie (Allgemeines) Paläozoologie → 19.4d Schädlinge → auch 32.5 Tierkrankheiten → 27.21 Tierzucht → 32.6
25.2	Allgemeine Zoologie
25.2a	Anatomie, Tierphysiologie
25.2b	Tiersoziologie, Tierökologie, ...
25.3	Spezielle Zoologie Haustiere → auch 27.21, 32.6
25.3p	Personen zu Zoologie

Source: [SWD-Sachgruppen](#)



Node Labels and Top Terms

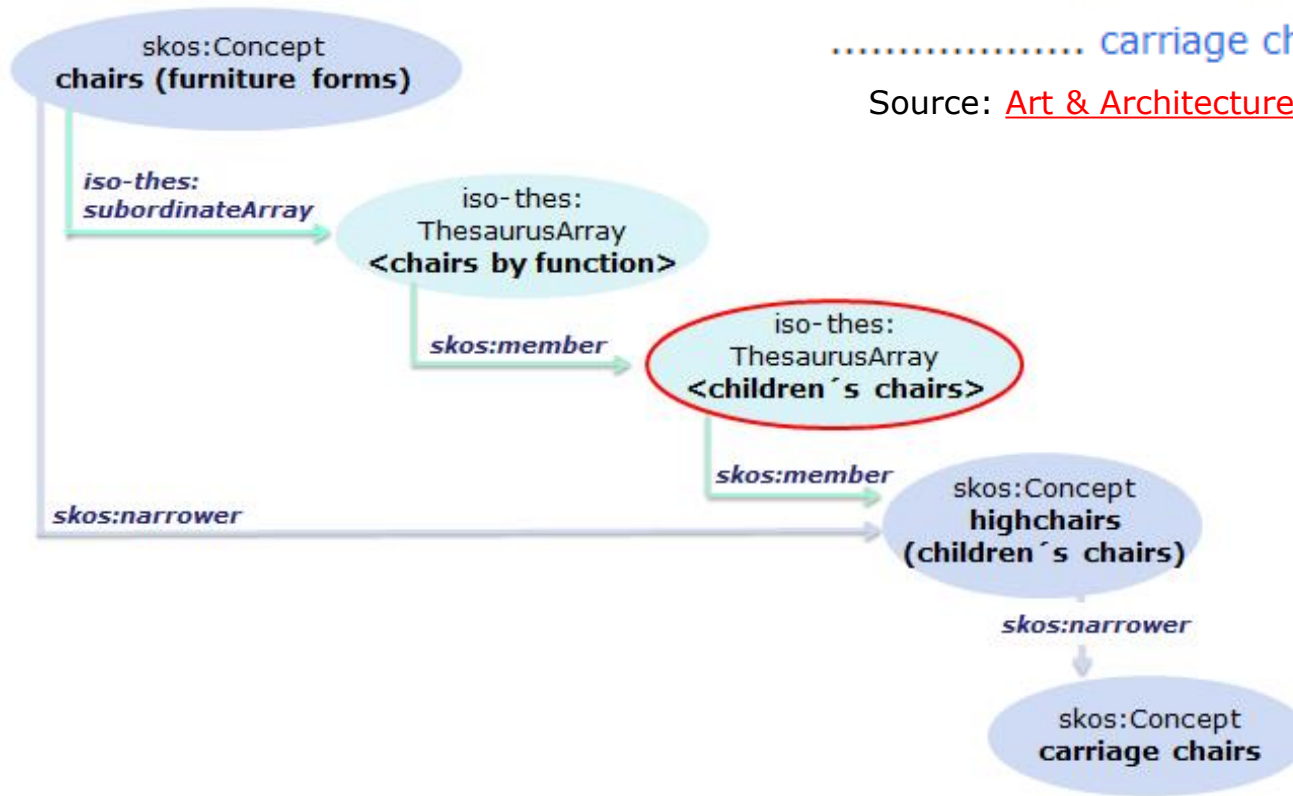
Guide Terms in the AAT Thesaurus (1)



Guide Terms in the AAT Thesaurus (2)

... chairs (furniture forms)
..... <chairs by function>
..... <children's chairs>
..... highchairs (children's chairs)
..... carriage chairs

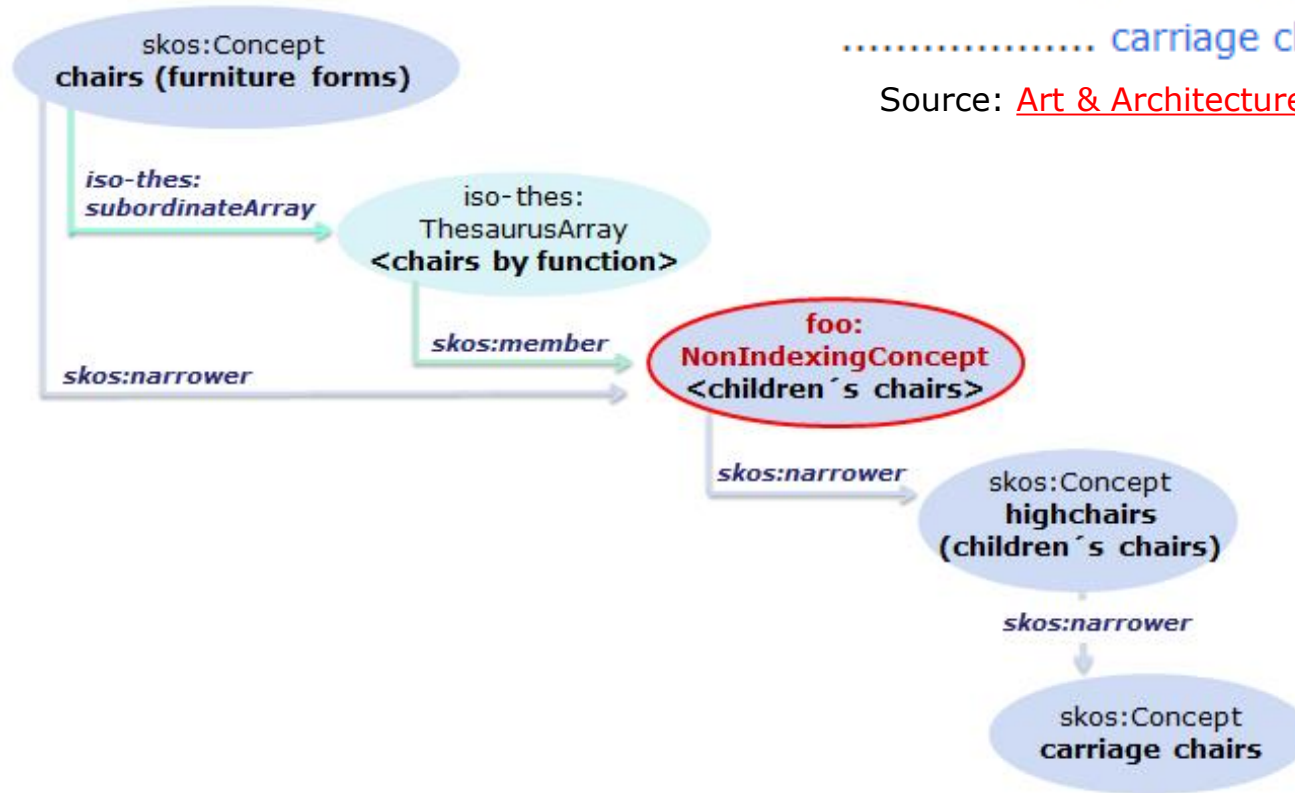
Source: [Art & Architecture Thesaurus](#)



Guide Terms in the AAT Thesaurus (3)

... chairs (furniture forms)
..... <chairs by function>
..... <children's chairs>
..... highchairs (children's chairs)
..... carriage chairs

Source: [Art & Architecture Thesaurus](#)



„Node label“ in the Bioethic Thesaurus (1)

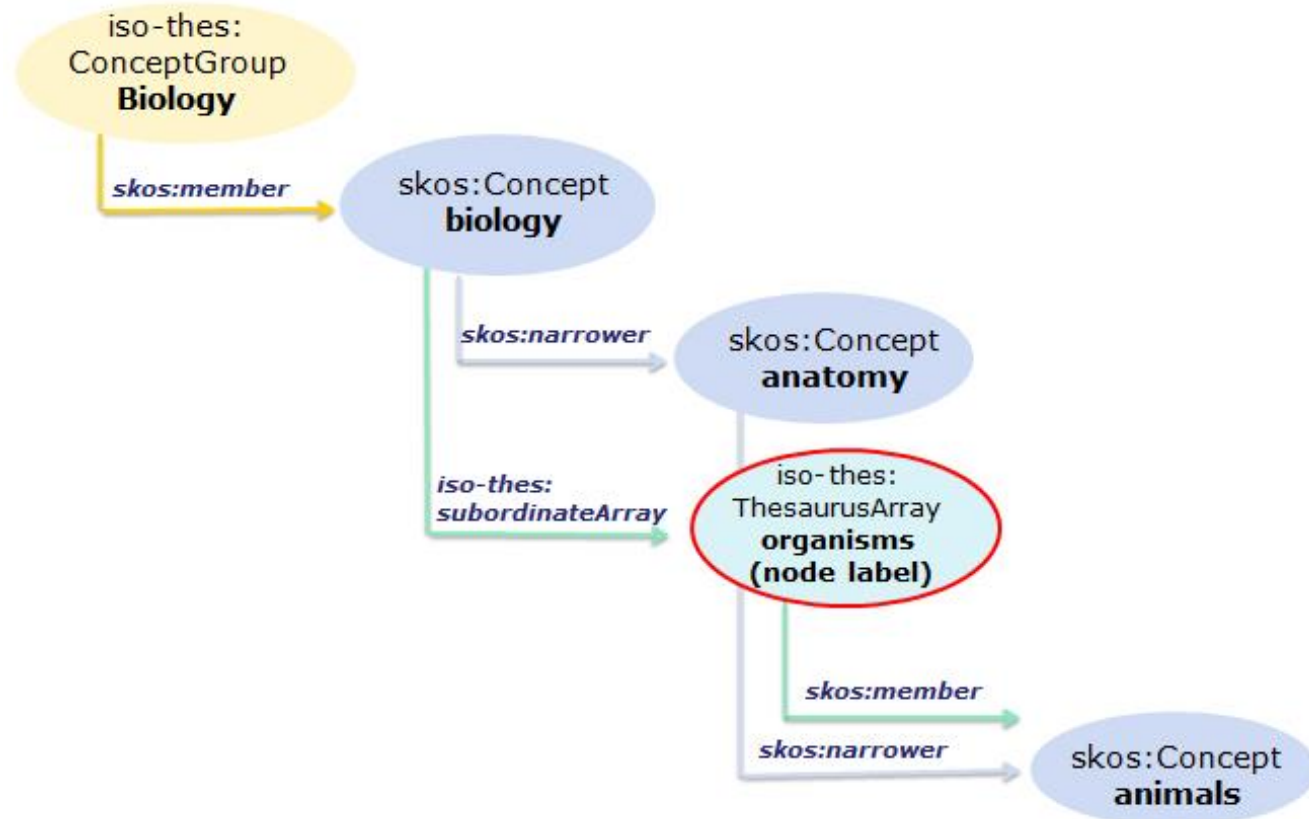
Subject Area IV: Biology

biology

anatomy
anthropology [biology]
behavioural biology +
biochemistry
biometry
biophysics
biosystematics +
botany +
cell biology +
chronobiology
developmental biology
ecology +
evolutionary biology +
histology
immunobiology +
microbiology +
molecular biology +
morphology

organisms (node label)

animals +
clones
fungi +
genetically modified organisms +
harmful organisms
introduced species +
microorganisms +
pathogenic organisms
plants +
renewable resources +
soil organisms
viruses +



„Node label“ in the Bioethic Thesaurus (2)

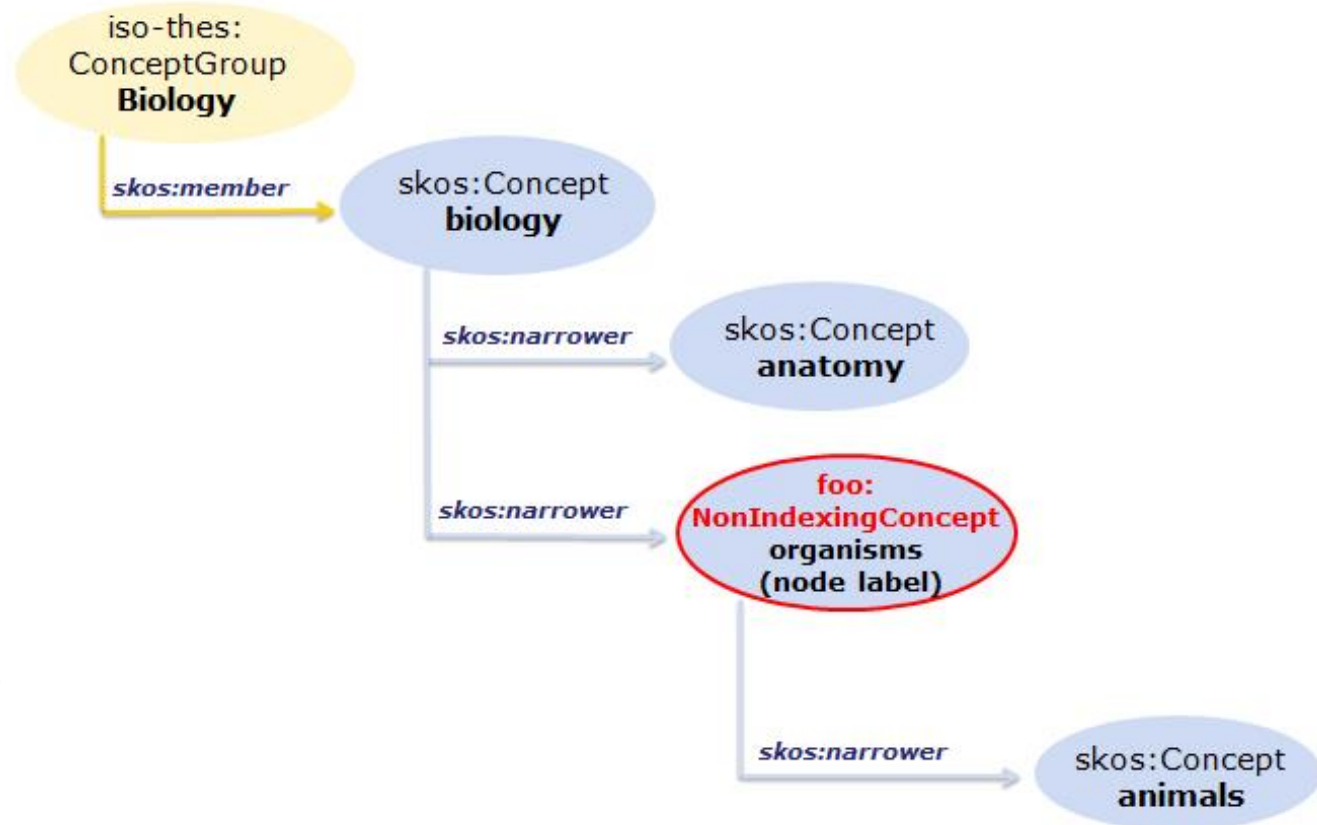
Subject Area IV: Biology

biology

anatomy
anthropology [biology]
behavioural biology +
biochemistry
biometry
biophysics
biosystematics +
botany +
cell biology +
chronobiology
developmental biology
ecology +
evolutionary biology +
histology
immunobiology +
microbiology +
molecular biology +
morphology

organisms (node label)

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Facets, Hierarchy Names and Guide Terms in the AAT Thesaurus

Top of the AAT hierarchies

.... Styles and Periods Facet	←	Record Type facet
..... Styles and Periods	←	hierarchy name
..... <styles and periods by general era>	←	guide term
..... ancient		concept
..... prehistoric		concept
..... protohistoric		concept
..... <three-age system>	←	guide term
..... Stone Age		concept
..... <transitional periods Stone Age to Bronze Age>	←	guide term
..... Bronze Age		
..... Iron Age		
..... Dark Ages (general style and period)		
..... Contemporary (style of art)		
..... Modern (styles and periods)		
..... pre-ceramic (general era)		
..... space age [N]		

Top Terms in the ELSST Thesaurus

Preferred Term	
EDUCATIONAL LEVELS	
Scope Note	
THE DEFINITIONS FOR THE LEVELS OF EDUCATION ARE BASED ON IS	
Synonyms/UFs	
Broader Terms	Narrower Terms
EDUCATIONAL SYSTEMS	PRE-PRIMARY EDUCATION PRIMARY EDUCATION SECONDARY EDUCATION TERTIARY EDUCATION
Top Terms(Click for hier Display)	
EDUCATION (TT)	



Groups

Systematics of the STW Thesaurus for Economics (1)

▼ V Economics

V.00 Economy

▶ V.01 Economic Theory

▶ V.02 Microeconomics

▶ V.03 Macroeconomics

▶ V.04 Business Cycle, Growth, and Economic Structure

▼ V.05 Money and Financial Markets

V.05.01 Monetary Theory

V.05.02 Monetary Policy

V.05.03 Inflation

V.05.04 Interest Rate

V.05.05 Credit

▼ V.05.06 Financial Markets

V.05.06.01 Money Market

▶ V.05.06.02 Securities Markets

V.05.06.03 Forward Market

V.05.06.04 Foreign Exchange Market

V.05.07 Payments

V.05.06 Financial Markets

V.05.06 Finanzmärkte (german)

broader

■ V.05 Money and Financial Markets ▼

narrower

■ V.05.06.01 Money Market ▼

■ V.05.06.02 Securities Markets ▼

■ V.05.06.03 Forward Market ▼

■ V.05.06.04 Foreign Exchange Market ▼

Descriptors

■ Arbitrage 

■ Arbitrage pricing 

...

■ Yield 

Persistent Identifier (for bookmarking and linking)

■ <http://zbw.eu/stw/thsys/70187>

Turtle representation of a systematics group of the STW

```
@base <http://zbw.eu/stw/> .
```

```
<thsys/71107>
```

```
  a skos:Concept, zbwext:Thsys ;
```

```
  rdfs:isDefinedBy <thsys/71107/about> ;
```

```
  rdfs:label "Securities Markets"@en, "Wertpapiermärkte"@de ;
```

```
  skos:notation "V.05.06.02"^^xsd:string ;
```

```
  skos:prefLabel "V.05.06.02 Securities Markets"@en,  
                 "V.05.06.02 Wertpapiermärkte"@de .
```

```
  skos:broader <thsys/70187> ; [Financial Markets]
```

```
  skos:narrower <descriptor/...>,  
                <thsys/71105>, [Bond Market]  
                <thsys/71106> ; [Stock Market]
```

```
  skos:inScheme <../stw> .
```

Source: <http://zbw.eu/stw/versions/8.10/thsys/71107/about.ttl>

Turtle representation using iso-thes extensions

```
<thsys/71107>
```

```
a iso-thes:ConceptGroup ;
```

```
rdfs:label "Securities Markets"@en, "Wertpapiermärkte"@de ;
```

```
skos:notation "V.05.06.02"^^xsd:string ;
```

```
skos:prefLabel "Securities Markets"@en,  
               "Wertpapiermärkte"@de .
```

```
iso-thes:subGroup <thsys/71105> ;
```

```
iso-thes:subGroup <thsys/71106> ;
```

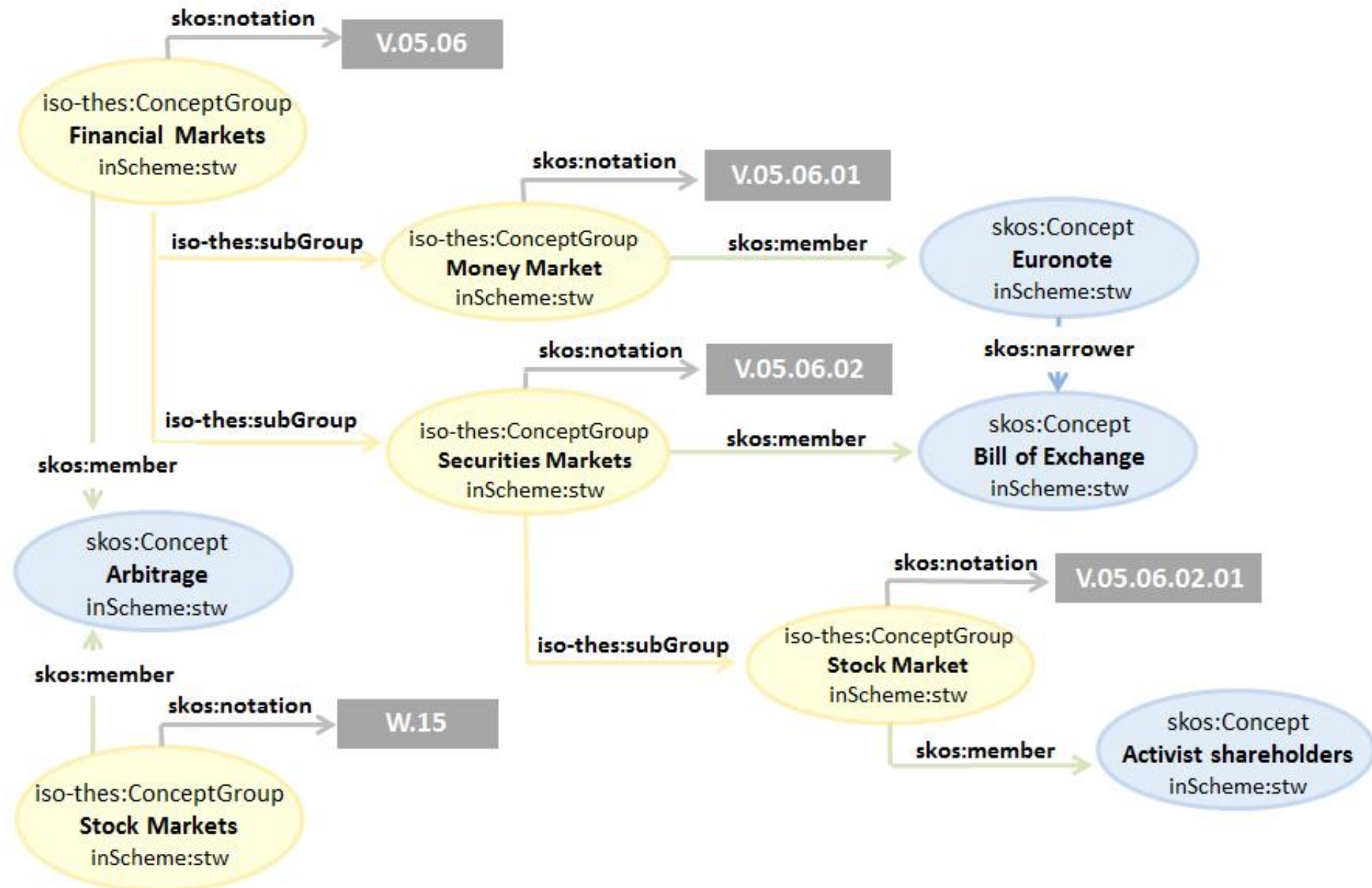
```
skos:member <descriptor/...> ,
```

```
skos:member <descriptor/...> ;
```

```
skos:inScheme <stw> ;
```

```
iso-thes:classificationOf <../stw> .
```


Systematics groups of the STW represented with iso-thes elements



Displays and user in interfaces

Products ▾ | fertilizer

Source: [Alibaba.com](https://www.alibaba.com)

▼ Category

Organic Fertilizer (24364)
Nitrogen Fertilizer (17431)
Compound Fertilizer (9084)
Urea (6986)
Other Fertilizers (6688)
[More..](#)

▼ Type

Compost (2905)
Humic Acid (12938)
Manure (1247)
[More..](#)

▼ State

Granular (26852)
Powder (21831)
Liquid (4224)

▼ Release Type

Quick (25255)
Controlled (7120)
Slow (16014)

fertilizers

(by type of plant nutrient)

— Calcium fertilizers ←

— Magnesium fertilizers

(by number of plant nutrients)

— Compound fertilizers ←

— Fertilizer combinations

(by substance group)

— Inorganic fertilizers

— Organic fertilizers ←

— Organomineral fertilizers

(by aggregate state)

— Liquid fertilizers ←

— Liquid gas fertilizers

(by nutrient release time)

— Slow release fertilizers ←

fertilizers (2867) + [Source: AGROVOC](https://agrovoc.org)

- NT Calcium fertilizers
- NT Compound fertilizers
 - • NT NPK fertilizers
 - • NT Nitrogen phosphorus fertilizers
 - • • NT Nitrophosphates
 - • NT Nitrogen potassium fertilizers
 - • NT Phosphorus potassium fertilizers
- NT Fertilizer combinations
 - • NT fertilizer pesticide combinations
- NT Inorganic fertilizers
- NT Liquid fertilizers
 - NT Liquid gas fertilizers
 - NT Magnesium fertilizers
 - NT Micronutrient fertilizers
 - NT Organic fertilizers
 - • NT Biofertilizers
 - • NT Composts
 - • • NT Potting composts
 - • NT Fish manure
 - • NT Green manures
 - • NT Guano
 - NT Organomineral fertilizers
 - NT Phosphate fertilizers
 - • NT Rock phosphate
 - • NT Superphosphate
 - NT Potash fertilizers
 - NT Slow release fertilizers
 - NT Sulphur fertilizers
 - NT nitrogen fertilizers
 - • NT ammonium fertilizers
 - • NT nitrate fertilizers

Descriptor display of German Parliament Thesaurus PARTHES

Schlagwort:	<input checked="" type="checkbox"/>	Haustier
Thesaurus:		Sachbegriffe
Definition:		NUR VERWENDEN für Heimtiere (z. B. Hauskatzen, Hunde)
Benutzt für:		
		Heimtier
Oberbegriffe:		
	<input type="checkbox"/>	→ Nutztier
Unterbegriffe:		
	<input type="checkbox"/>	→ Hund
	<input type="checkbox"/>	→ Katze
Verwandte Begriffe:		
	<input type="checkbox"/>	→ Tierhaltung
	<input type="checkbox"/>	→ Tierhandel
	<input type="checkbox"/>	→ Tierheim
Zuordnung:		
		→ NU.01.01 - Tiere
		→ LE.05 - Tierhaltung, Tierzucht, Tierschutz

Systematic display of German Parliament Thesaurus PARTHES

Auswahl	Details
<div><div><input checked="" type="checkbox"/> RE Religion, Ethik und Philosophie</div><div><input checked="" type="checkbox"/> MK Medien, Information und Kommunikation</div><div><input type="checkbox"/> NU Natur und Umwelt</div><div><input type="checkbox"/> NU.01 Lebewesen</div><div>NU.01.01 Tiere</div><div>NU.01.02 Pflanzen</div><div>NU.02 Landschaften, Ökosysteme, Biotope</div><div>NU.03 Klima, Wetter, Luft</div><div>NU.04 Boden</div><div>NU.05 Wasser und Gewässer</div><div>NU.06 Umweltbelastungen,</div></div>	<div><div><input type="checkbox"/> → Hai</div><div><input type="checkbox"/> → Hase</div><div><input type="checkbox"/> → Haustier</div><div><input type="checkbox"/> → Huhn</div><div><input type="checkbox"/> → Hund</div><div><input type="checkbox"/> → Insekt</div><div><input type="checkbox"/> → Kampfhund</div><div><input type="checkbox"/> → Kaninchen</div><div><input type="checkbox"/> → Katze</div></div>

Hierarchical display of German Parliament Thesaurus PARTHES

Auswahl

- ☐ Lebewesen
 - Gentechnisch veränderter Organismus
 - Mensch
 - ☒ Mikroorganismen
 - ☒ Pflanze
 - Pilz
 - ☒ Schädling
 - ☐ Tier
 - Amphibie
 - ☒ Insekt
 - Kleintier
 - Nagetier
 - ☐ Nutztier
 - Biene
 - ☐ Haustier
 - ☒ Hund
- Katze**

Details

Schlagwort: ☒ **Katze**

Thesaurus: Sachbegriffe

Benutzt für:

Hauskatze

Oberbegriffe:

☐ → Haustier

Zuordnung:

→ NU.01.01 - Tiere

Aktivitäten: 11

Vorgänge: 10



Make things as simple as possible, but not simpler.