

Comparative concepts: database and visualization

William Croft, *University of New Mexico*
wacroft@icloud.com

- Database overview
- Using the visualization: general strategy
- A more complex example: taxonomy of declaratives
- Construction strategies and functions
- Example: strategies for the transitive construction
- Example: function of the ditransitive construction
- Taxonomies of events and semantic roles
- Taxonomy of events by semantic domain
- Taxonomy of semantic roles

Database overview

Cambridge Textbooks in Linguistics

Morphosyntax

Constructions of the World's
Languages

William Croft

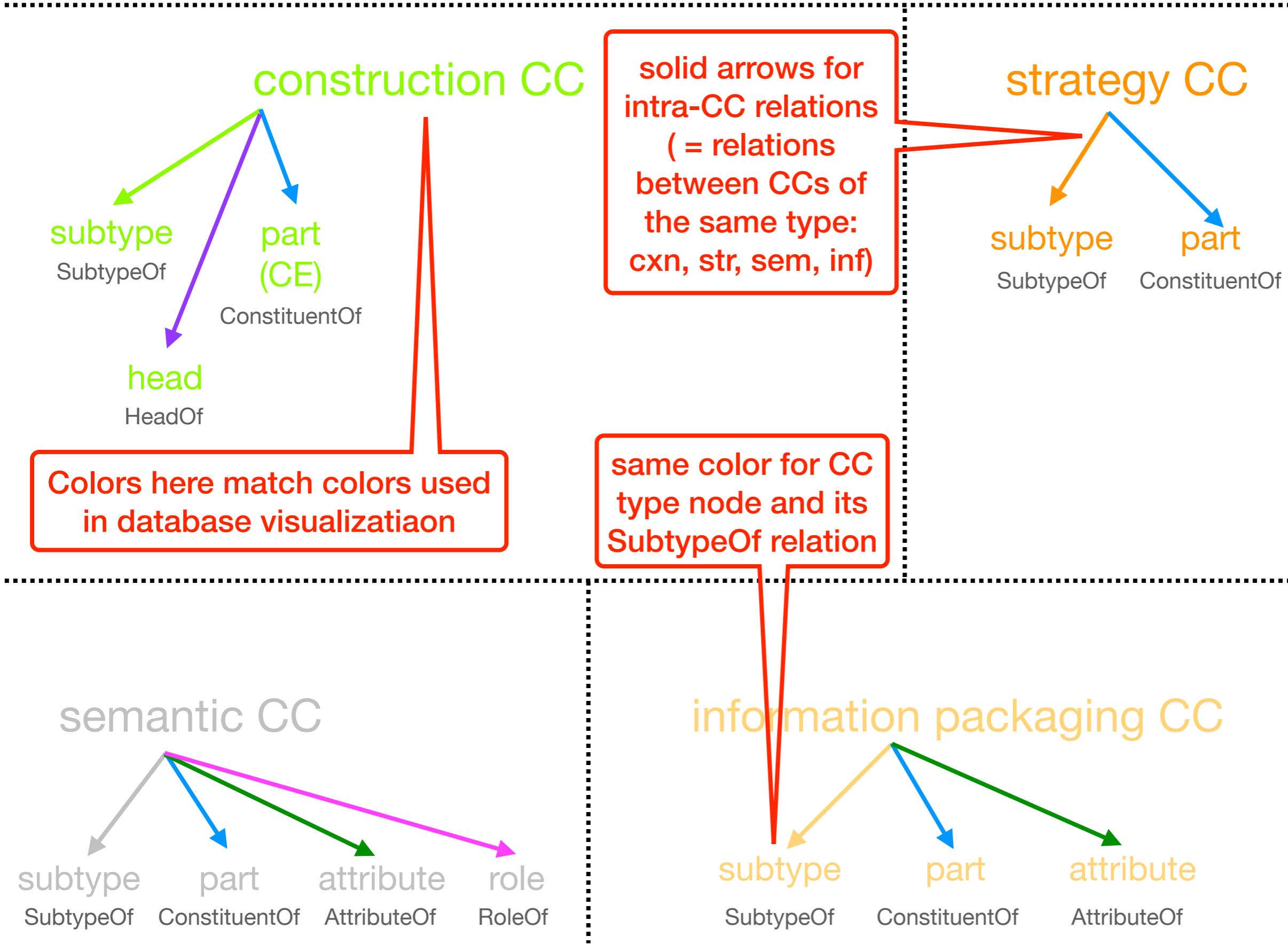
[Cambridge University Press (2022). Pp. xxxvi, 688, plus an 87 page online Glossary]

The Comparative Concepts (CC) Database in MoCCA

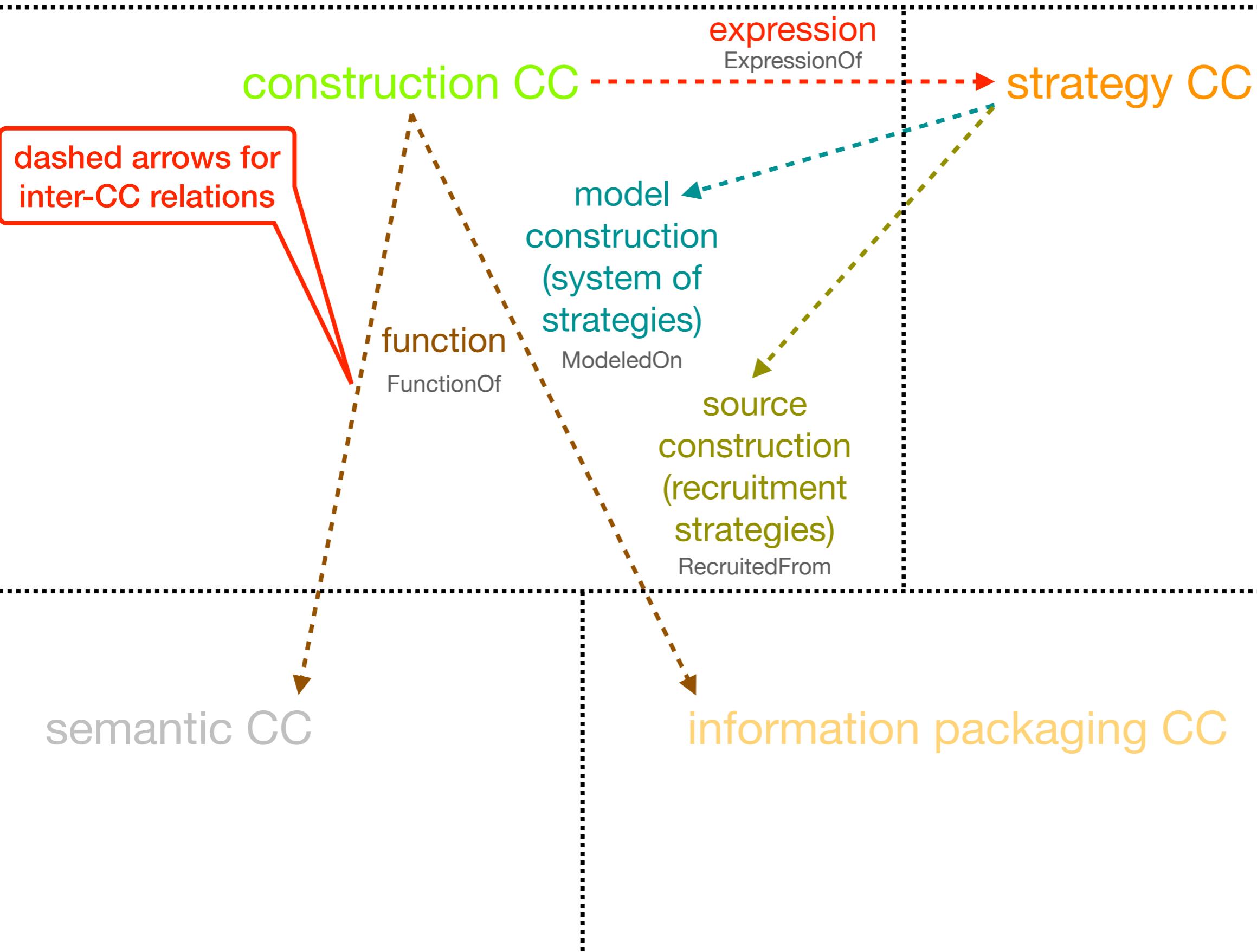
- *Morphosyntax: Constructions of the World's Languages* provides a survey of major constructions, their functions (semantics and information packaging) and their strategies, based on the results of typology since Greenberg (1966)
- The Glossary of Comparative Concepts to *Morphosyntax* is being converted to a database* that includes relations between the four main types of comparative concepts, to be used for the alignment of constructicons (along with FrameNet)
- The current version includes revisions to the comparative concept inventory in *Morphosyntax*

*Arthur Lorenzi Almeida (Federal University of Juiz de Fora, Brazil), Peter Ljunglöf (Gothenburg University, Sweden), André Coneglian (Federal University of Minas Gerais, Brazil), Bill Croft (University of New Mexico, USA), Joakim Nivre (Uppsala University, Sweden)

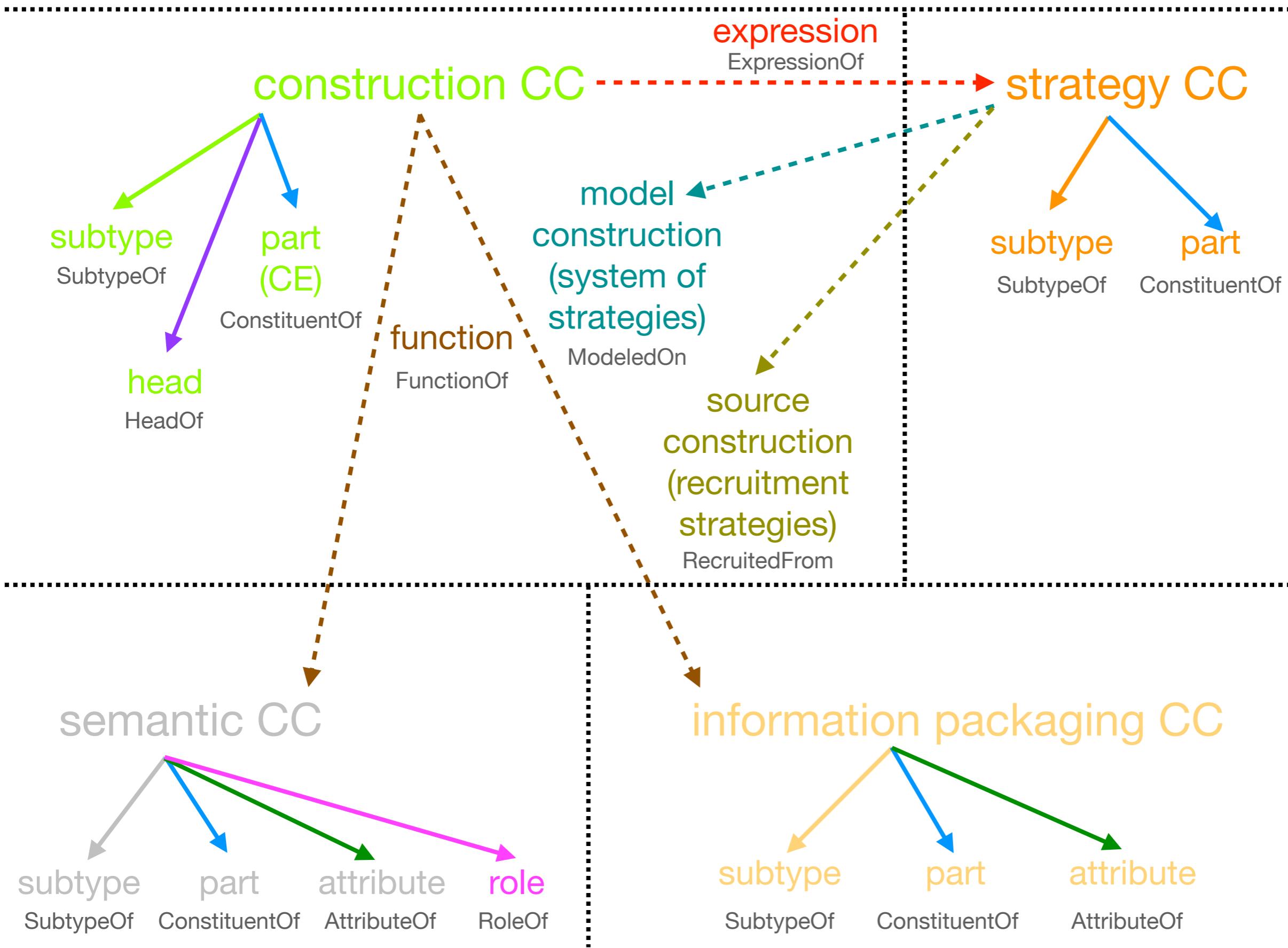
Structure of the CC database: intra-CC relations



Structure of the CC database: inter-CC relations



Structure of the CC database: all relations



menu to filter and/or search the database (toggles on and off)

Database of Comparative Concepts

Extracted and expanded from the appendix of *Morphosyntax: Constructions of the World's Languages*, by William Croft (2022)

Explore our interactive [graph visualization of the CC database](#).

Build date/time: 2024-11-04 10:04:55

Statistics: 1086 CCs, with 2084 typed relations and 3604 links within CC definitions

Show

construction strategy meaning
 information packaging definition other

Find a name relation definition
that contains starts with words start with

Type at least 3 characters

A role (sem)

basic name, type information

Id	sem:a-role
Type	meaning
Alias(es)	A role A A (role)
Function of	ditransitive A-phrase (cxn) passive-inverse A phrase (cxn) transitive A-phrase (cxn)
Role of	agentive change of state event (sem)
Associated	active category (str) ergative category (str) nominative category (str)
Taxonomy	valency role (sem)
Definition	<p>A role (sem)</p> <p>the agent or agent-like central participant role in the prototypical bivalent event (that is, a breaking event) or the prototypical trivalent event (that is, a giving event). Examples: in <i>Jack broke the window</i>, Jack plays the A role in the breaking event; and in <i>Jill gave Joe the keys</i>, Jill plays the A role in the giving event. (Section 6.3.1)</p>

A-not-A (str)

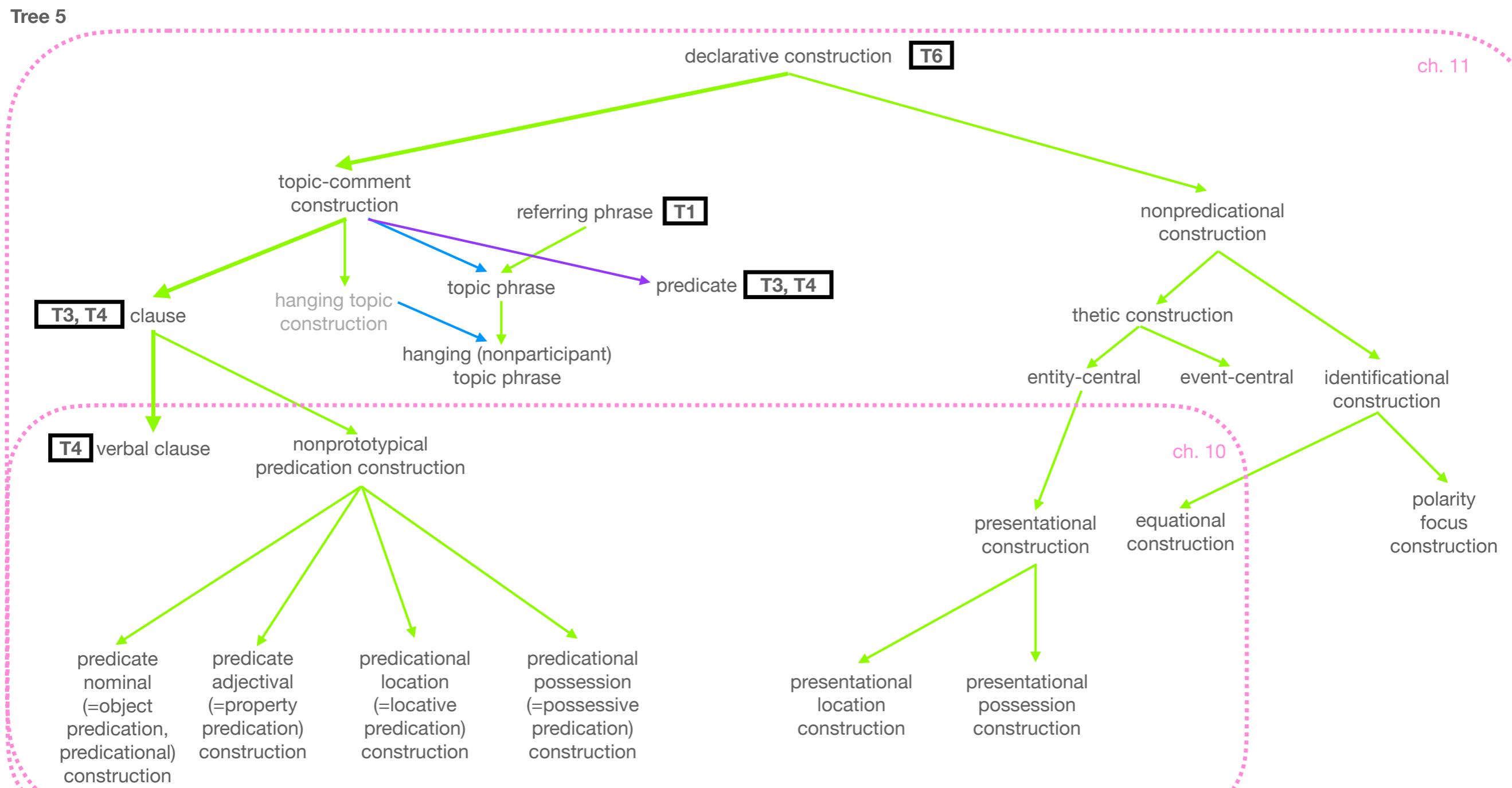
To come: links to examples, with UD parses

Id	str:a-not-a
Type	strategy
Alias(es)	A-not-A
Expresses	polarity question construction (cxn)
Taxonomy	encoding strategy (str)
Definition	<p>A-not-A (str)</p> <p>a strategy for polarity question constructions in which both the positive and negative form of the proposition are expressed. Example: Mandarin <i>tā zài jiā bu zài jiā</i> [lit. ‘S/he at home not at home’] ‘Is s/he at home?’ is an instance of the A-not-A strategy for polarity questions. The A-not-A strategy is essentially the recruitment of the alternative question construction for the polarity question function.</p>

Manually constructed trees of CC relations (except FunctionOf)

<https://github.com/comparative-concepts/cc-database/tree/main/cc-relation-trees>

Construction Relations



Using the visualization:
general strategy

Visualization of the Comparative Concepts database

► Instructions

Graph: Select a graph

Show: Names Stabilize: Atlas2 Subgraph: grow: remove:

Selection: expand: search: Type at least 3 characters

The full database is much too large to visualize on even a large desktop screen

So we have created a series of graphs of parts of the CC database

Even so, the graphs are still too large, so we have created ways to select a subset of nodes and edges, and add (expand/grow) or remove parts of a subgraph

Visualization of the Comparative Concepts database

▼ Instructions

What the controls mean:

- **Graph:** Here you select one of five different graph "types". When you have selected one, you can decide which relations you want to see.
- **Show:** Should the nodes show the ids or the names of the CCs?
- **Stabilize:** You can turn off the auto-stabilization here, or decide which algorithm it should use.
- **Subgraph:** Here you can decide if you want to show just a part of the nodes in the graph (together with their relations).
- **Selection:** Here you can select graph nodes in different ways.

How you can interact with the graph itself:

- To zoom in/out, use the mouse scroll wheel or "pinch" on the touchpad.
- To move the canvas around, click-and-drag the background.
- To select a node, click on it.
- To select several nodes (or deselect), click-and-hold just a little while.
- To unselect all nodes, click on the background (or the button "Clear selection").
- To move the selected nodes, click-and-drag them.
- To see the definition of a CC, hover over a node and wait a little while.

Graph: Select a graph ▾

Show: Names ▾ **Stabilize:** **Subgraph:** Clear grow: upwards downwards outwards remove: unselected selected

Selection: Clear Unconnected expand: upwards downwards outwards search: Type at least 3 characters

Notes to users:

- Currently available graphs: Constructions, Strategies, Semantic (content), Information packaging, Cxn↔Str (ExpressionOf), Cxn↔Sem+Inf (FunctionOf)
- All graphs include SubtypeOf and ConstituentOf relations (the latter where applicable)
- Graphs currently show names of the CCs only. Mousing over a node pops up a window with the definition
- Graphs are constructed automatically using Vis-Network. This package optimizes display in a star, not tree, format
- It takes a while to load the Cxn↔Str (ExpressionOf) and Cxn↔Sem+Inf (FunctionOf) graphs; please be patient!
- Unfortunately there is no Undo function, so errors in pruning will require you to Clear Subgraph and start again (but see below)

Visualization of the Comparative Concepts database

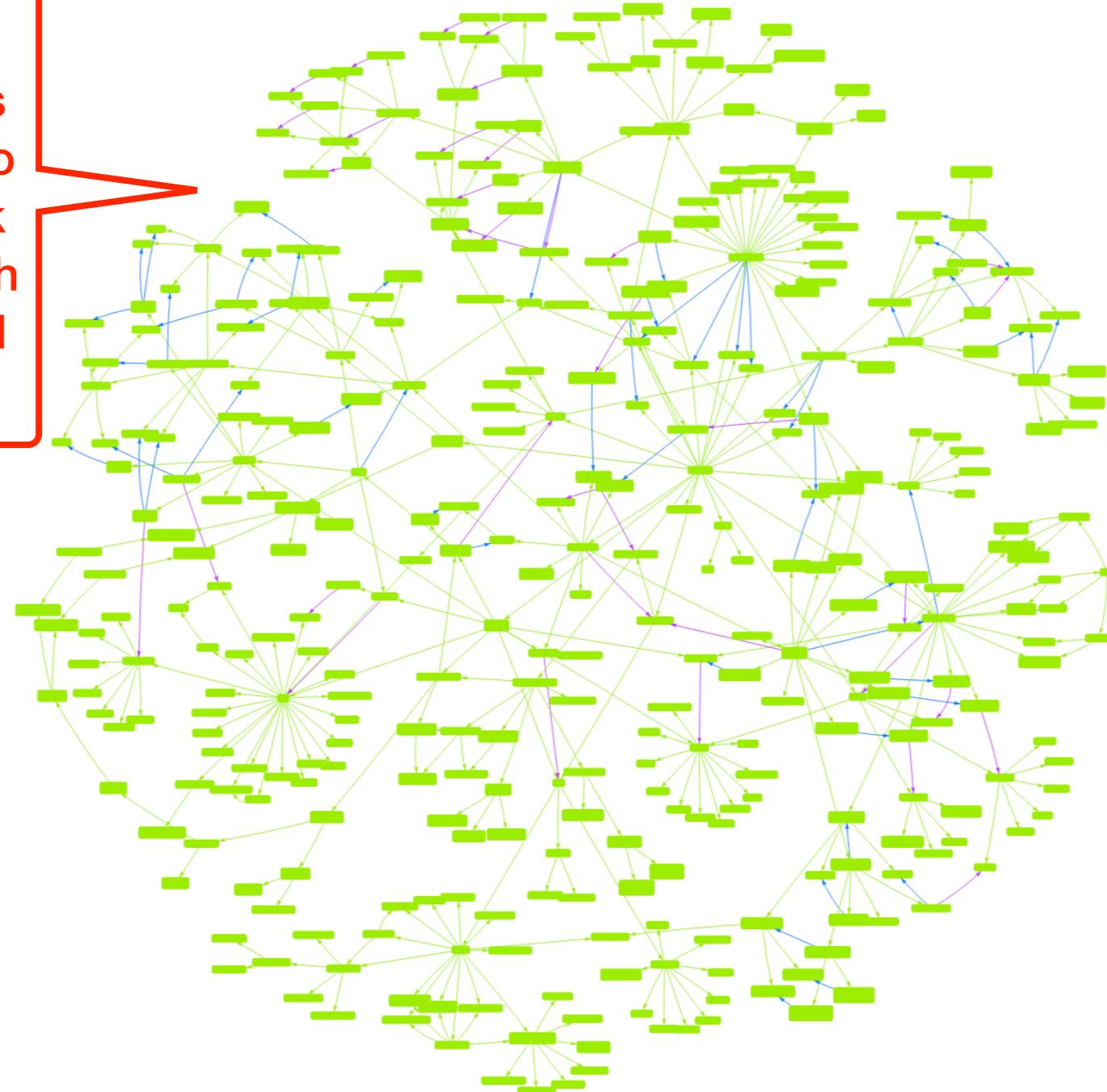
► Instructions

Graph: Constructions SubtypeOf ConstituentOf HeadOf

Show: Names Stabilize: Atlas2 Subgraph: grow: remove:

Selection: expand: search:

The graph of all constructions is still too large. So we need to pick out the subgraph we're interested in.



You could just browse the graph. But if you want to focus in, here's a general strategy.

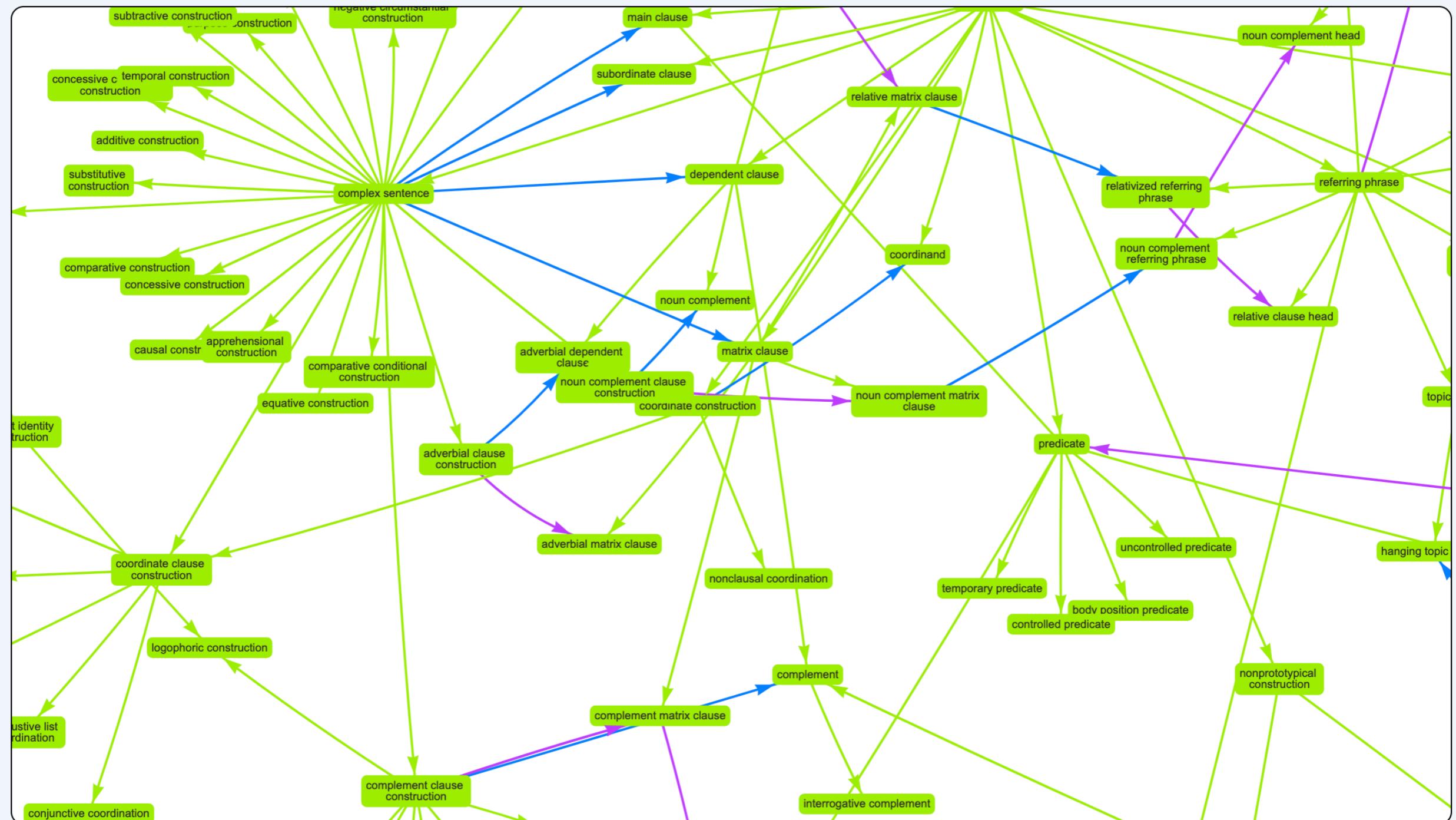
Visualization of the Comparative Concepts database

► Instructions

Graph: **Constructions** [SubtypeOf](#) [ConstituentOf](#) [HeadOf](#)

Show: **Names** **Stabilize:** **Atlas2** Subgraph: **clear** grow: **upwards** **downwards** **outwards** remove: **unselected** **selected**

Selection: **clear** **all visible** **unconnected** expand: **upwards** **downwards** **outwards** search: Type at least 3 characters



Current graph: 355 nodes; 488 edges

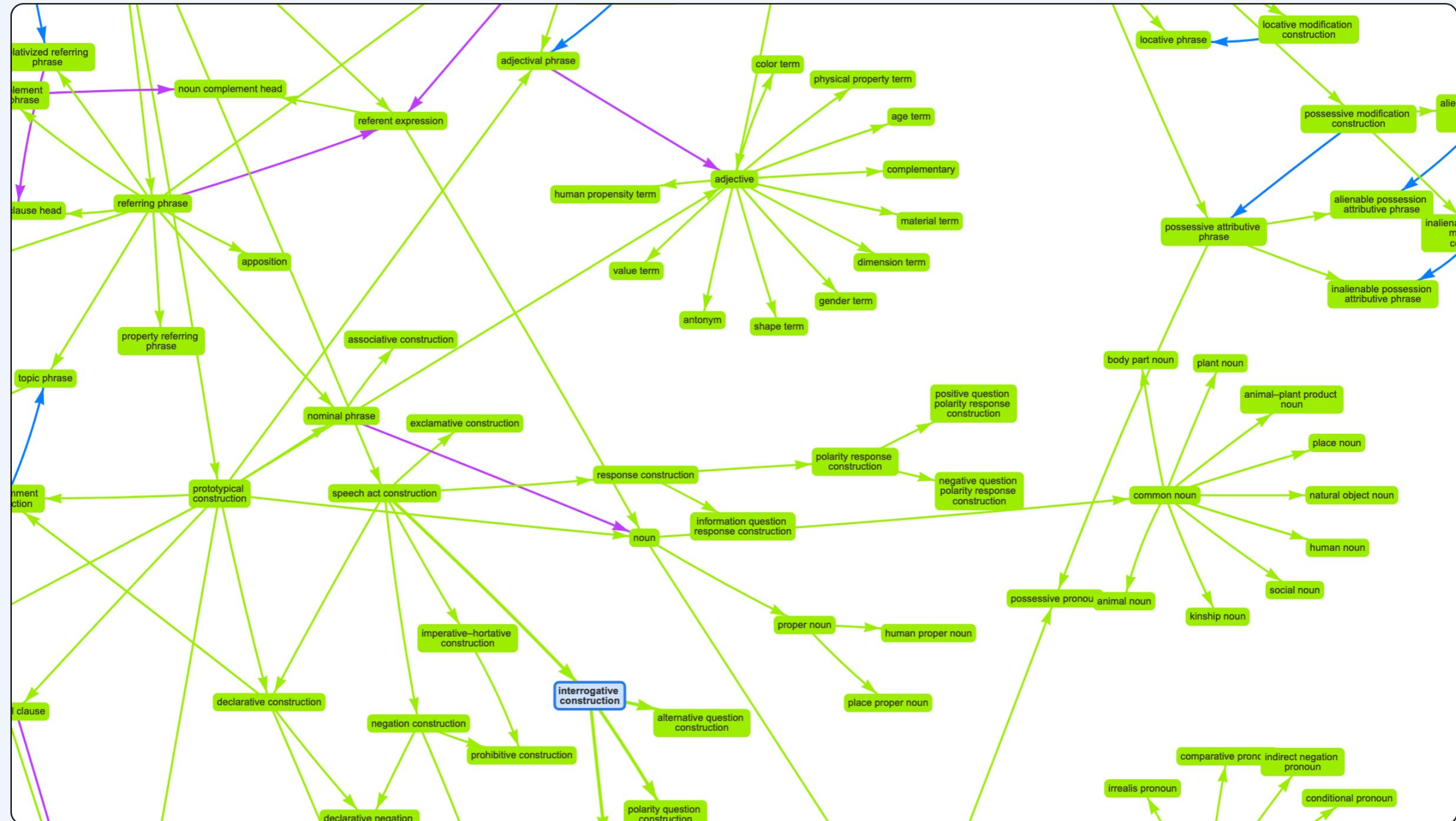
Visualization of the Comparative Concepts database

► Instructions

Graph: Constructions SubtypeOf ConstituentOf HeadOf

Show: Names **Stabilize:** Atlas2 **Subgraph:** clear grow: upwards downwards outwards remove: unselected selected

Selection: clear all visible unconnected expand: upwards downwards outwards search: interrogative construction



Current graph: 355 nodes, 1 selected; 488 edges

General strategy: (1) search on construction you're interested in

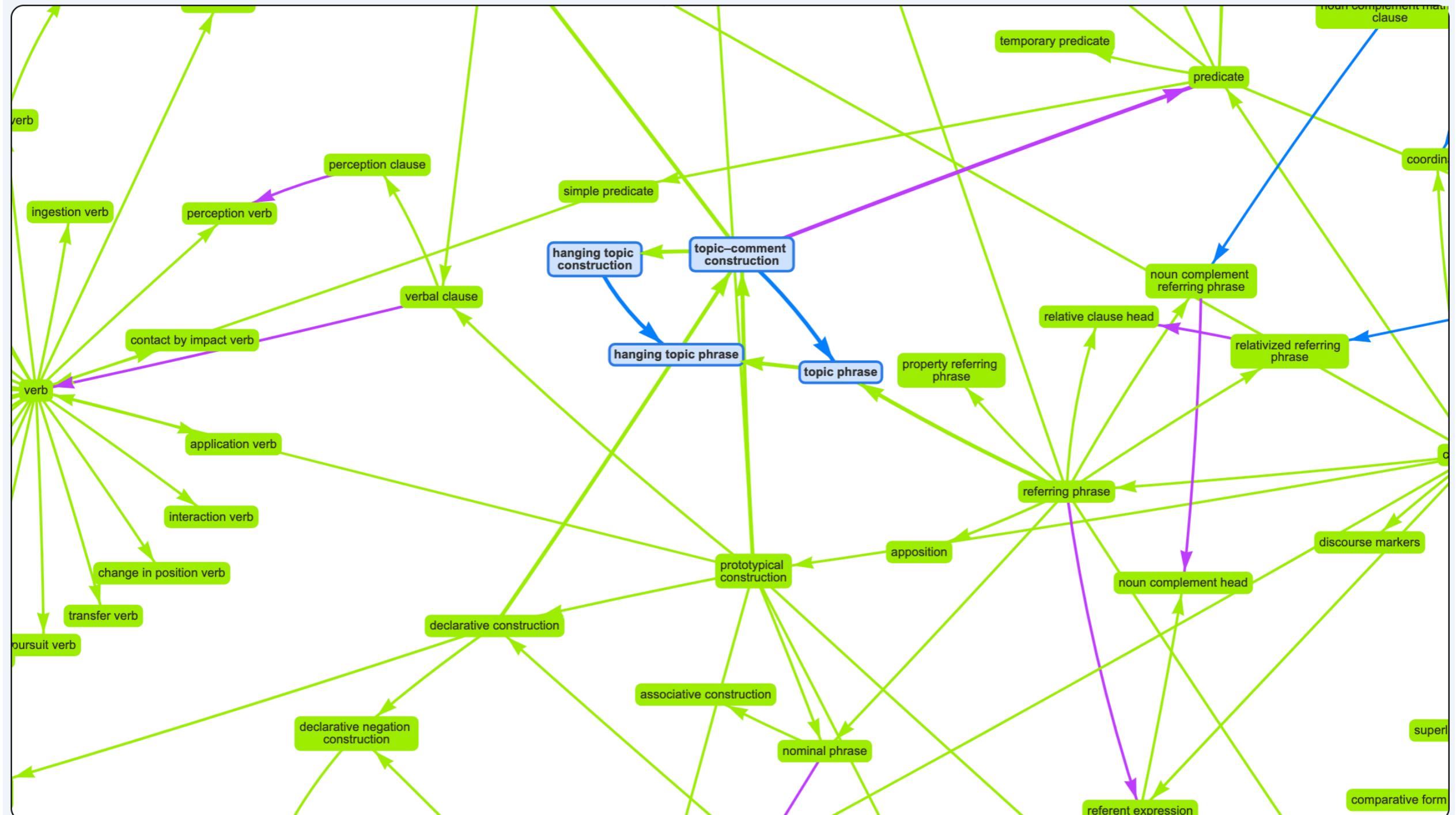
Visualization of the Comparative Concepts database

► Instructions

Graph: SubtypeOf ConstituentOf HeadOf

Show: **Stabilize:** **Subgraph:** grow: remove:

Selection: expand: search:



Current graph: 355 nodes, 4 selected; 488 edges

Visualization of the Comparative Concepts database

► Instructions

Graph: [SubtypeOf](#) [ConstituentOf](#) [HeadOf](#)

Show: [Stabilize](#): [Atlas2](#) Subgraph: grow: remove:

Selection: expand: search:

General strategy: (2) Click on “remove unselected” to make the construction your starting point

topic–comment
construction

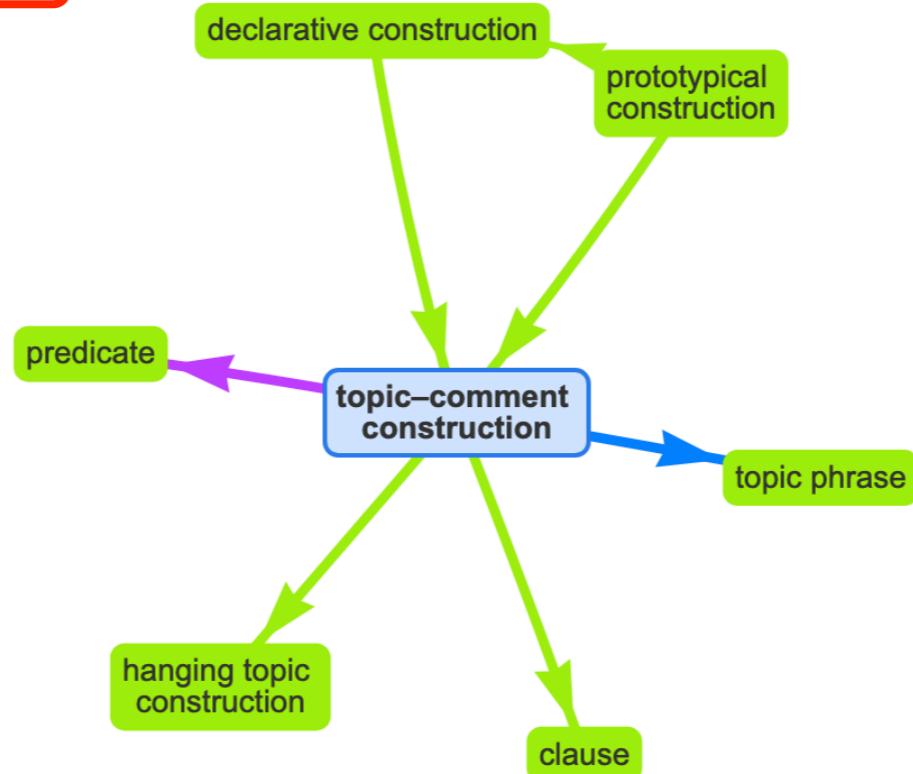
Visualization of the Comparative Concepts database

► Instructions

Graph: **Constructions** SubtypeOf ConstituentOf HeadOf
Show: **Names** **Stabilize:** **Atlas2** Subgraph: **clear** grow: **upwards** **downwards** **outwards** remove: **unselected** **selected**
Selection: **clear** **all visible** **unconnected** expand: **upwards** **downwards** **outwards** search: **topic**

General strategy: (3) Grow the graph. If you want to just explore the neighborhood, toggle on all the relations

General strategy: (4) Then click on grow: outwards to see all relations in all directions



Visualization of the Comparative Concepts database

► Instructions

Graph:

Constructions

SubtypeOf

ConstituentOf

HeadOf

Show:

Names

Stabilize:

Atlas2

Subgraph:

clear

grow: upwards

downwards

outwards

remove: unselected selected

Selection:

clear

all visible

unconnected

expand: upwards

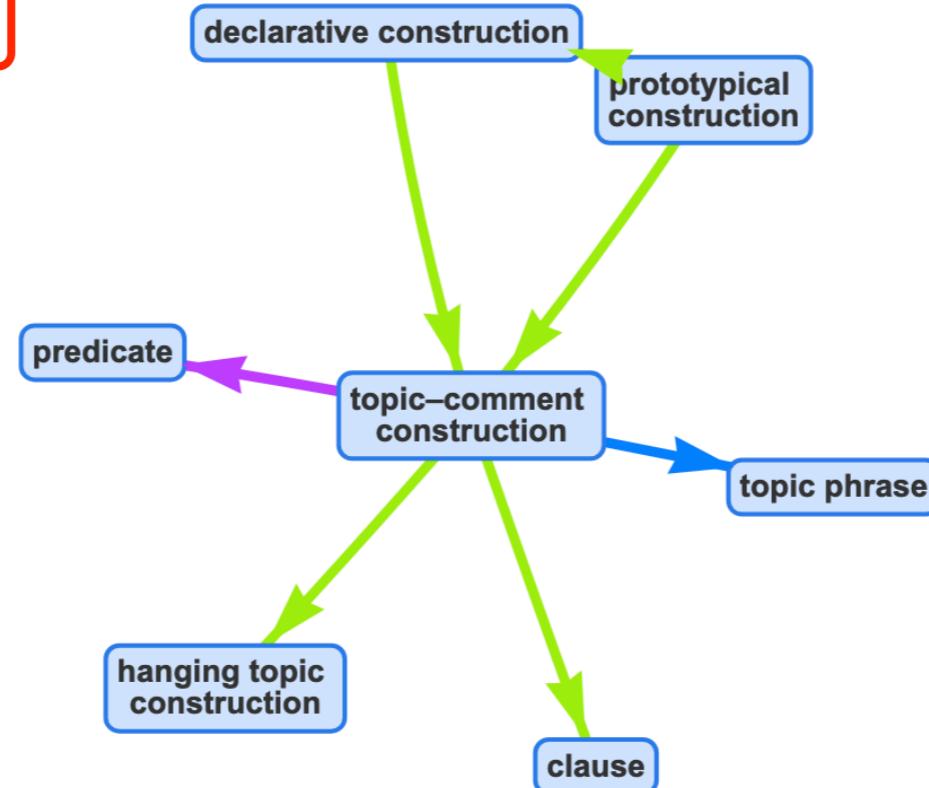
downwards

outwards

search: topic

General strategy: (5) To grow the graph again, expand: outwards to select the CCs you just grew

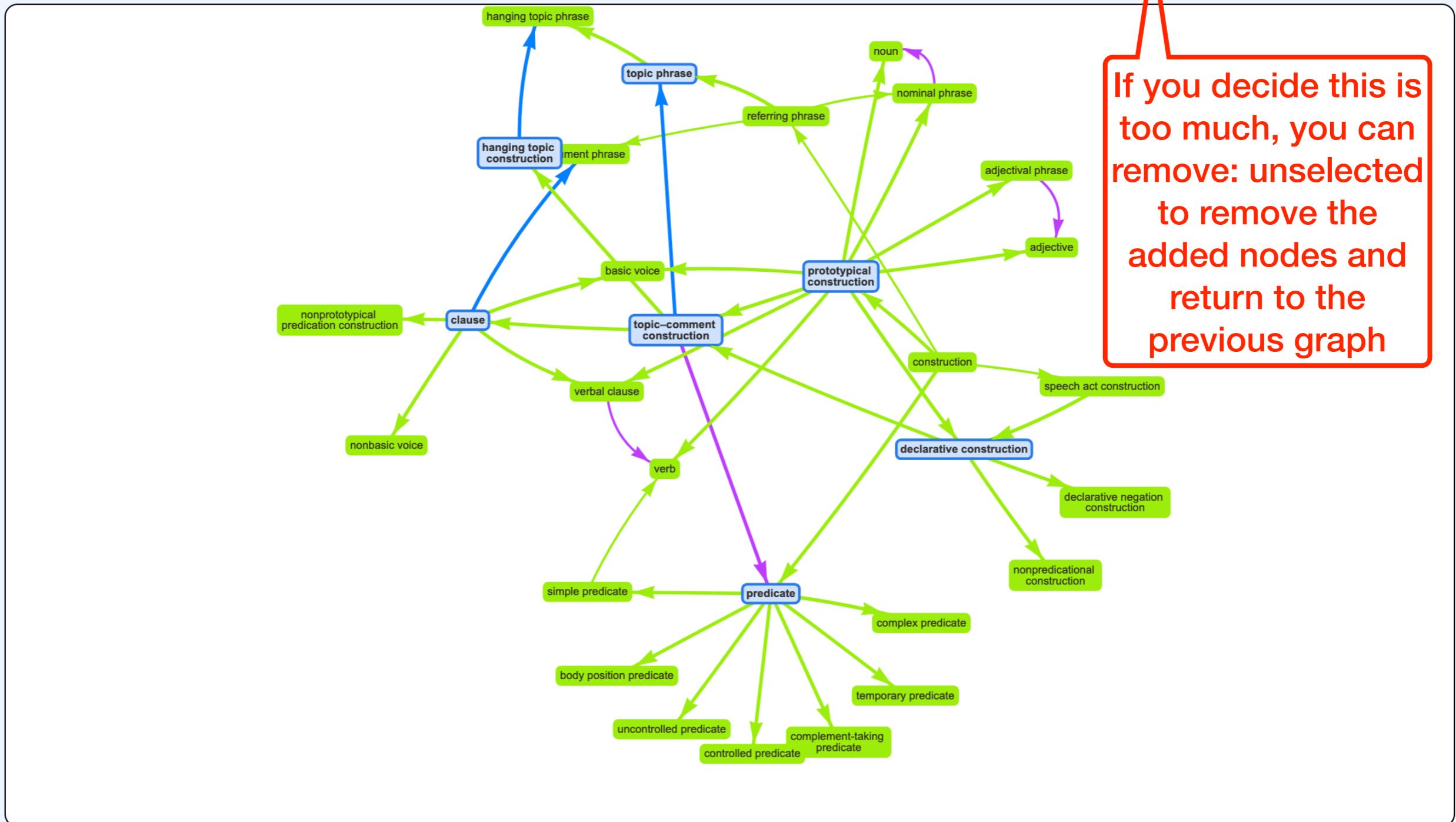
General strategy: (6) Then grow: outwards again (see next slide)



Visualization of the Comparative Concepts database

► Instructions

Graph: SubtypeOf ConstituentOf HeadOf
Show: Stabilize: Atlas2 clear grow: upwards downwards outwards remove: unselected selected
Selection: expand: upwards downwards outwards search: topic



Current graph: 30 nodes (of 355), 7 selected; 42 edges (of 488)

Visualization of the Comparative Concepts database

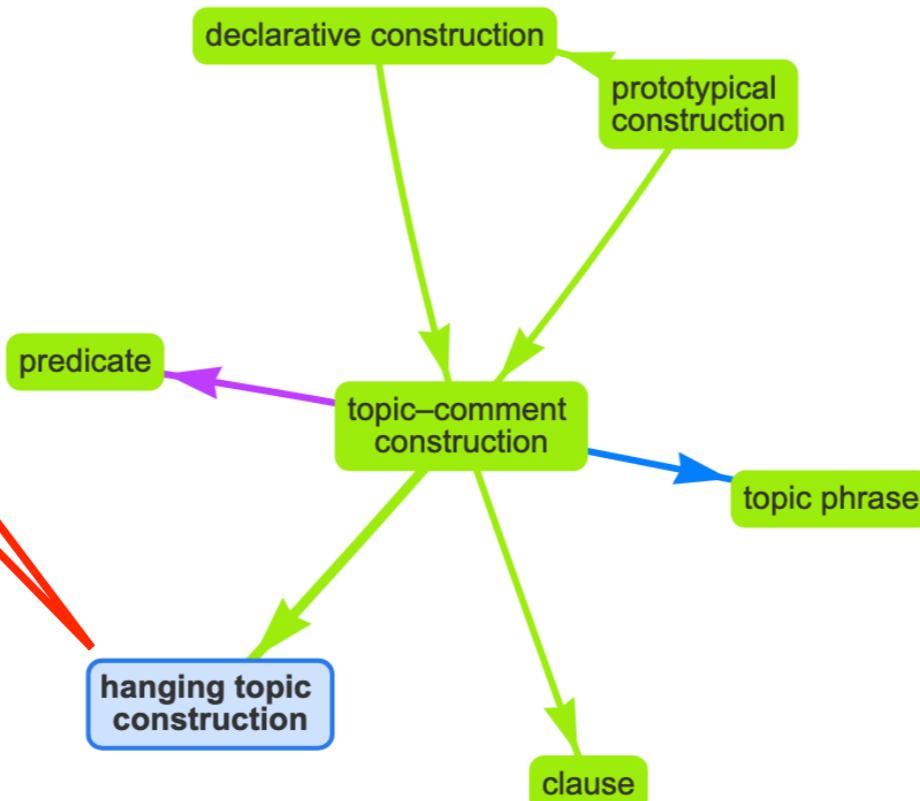
► Instructions

Graph: Constructions SubtypeOf ConstituentOf HeadOf

Show: Names Stabilize: Atlas2 Subgraph: grow: remove:

Selection: expand: search:

General strategy: (5b)
Let's back up to step
5. Say you're
interested in just the
hanging topic
construction. Select
just that construction
by clicking on it



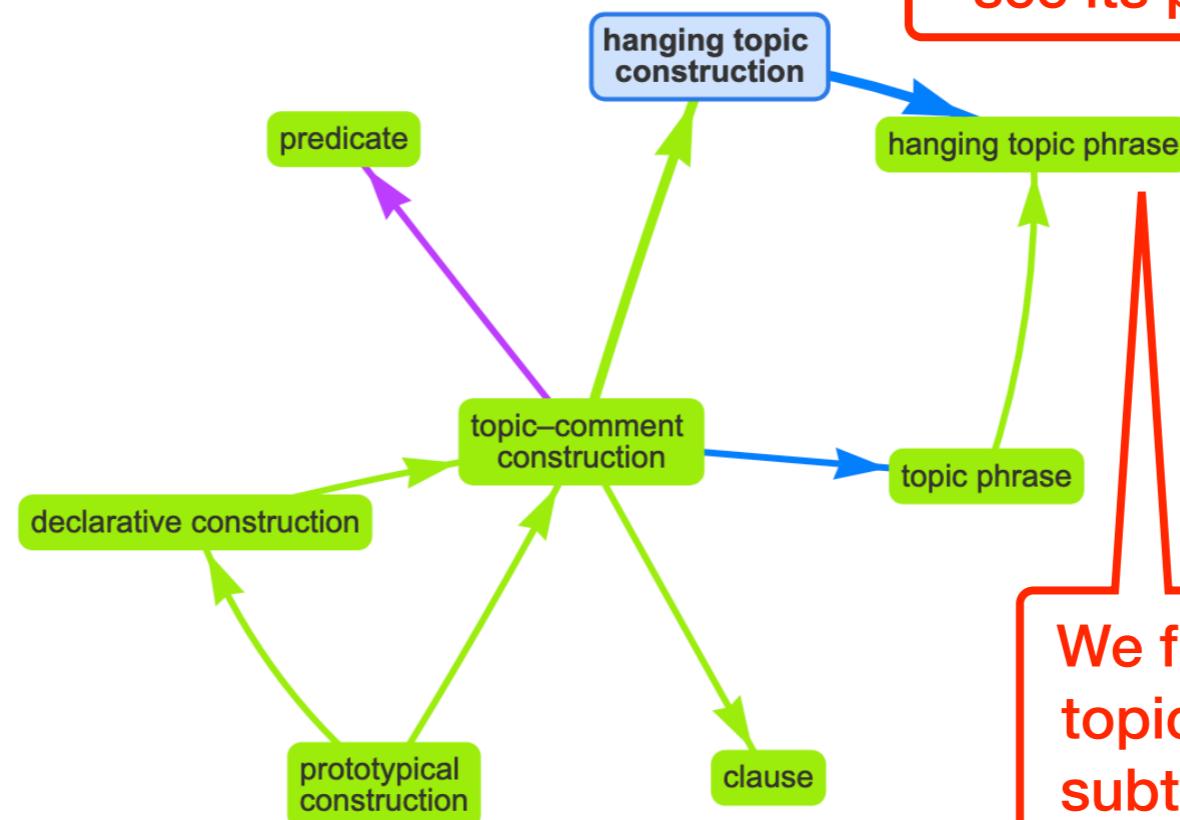
Visualization of the Comparative Concepts database

► Instructions

Graph: **Constructions** [SubtypeOf](#) [ConstituentOf](#) [HeadOf](#)

Show: **Names** **Stabilize:** **Atlas2** Subgraph: **clear** grow: **upwards** **downwards** **outwards** remove: **unselected** **selected**

Selection: **clear** **all visible** **unconnected** expand: **upwards** **downwards** **outwards** search: **topic**



General strategy: (6b) Then grow: downwards only, to see its parts or subtypes

We find it has a hanging topic phrase, which is a subtype of topic phrase

Visualization of the Comparative Concepts database

► Instructions

Graph: **Constructions** [SubtypeOf](#) [ConstituentOf](#) [HeadOf](#)

Show: **Names** Stabilize: **Atlas2** Subgraph: grow: remove:

Selection: expand: search:

General strategy: (3c) Let's back up to step 3. If you're only interested in the subtypes, toggle off ConstituentOf and Head of.

General strategy: (4c) Then grow just downwards.

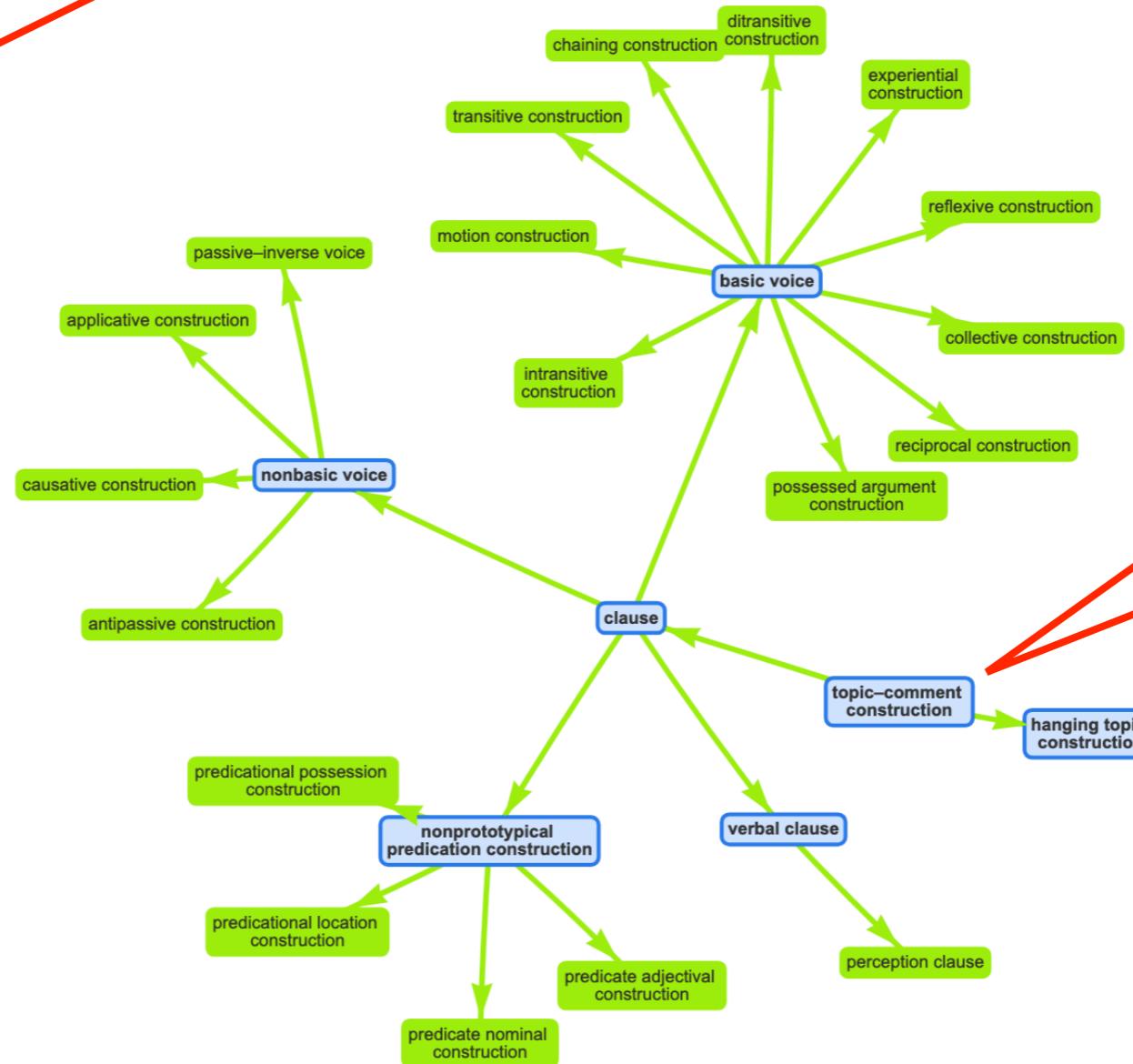
topic–comment
construction

Visualization of the Comparative Concepts database

► Instructions

Graph: Constructions SubtypeOf ConstituentOf HeadOf
Show: Names Stabilize: Atlas2 Subgraph: grow: remove:
Selection: expand: search:

General strategy:
(5c-6c) As with steps 5-6 before, to continue growing the graph, expand: downwards and grow: downwards.



Here, we have expanded/grown downwards twice in a row, after the first grow downwards from a single CC.

A more complex example:
taxonomy of declaratives

Visualization of the Comparative Concepts database

► Instructions

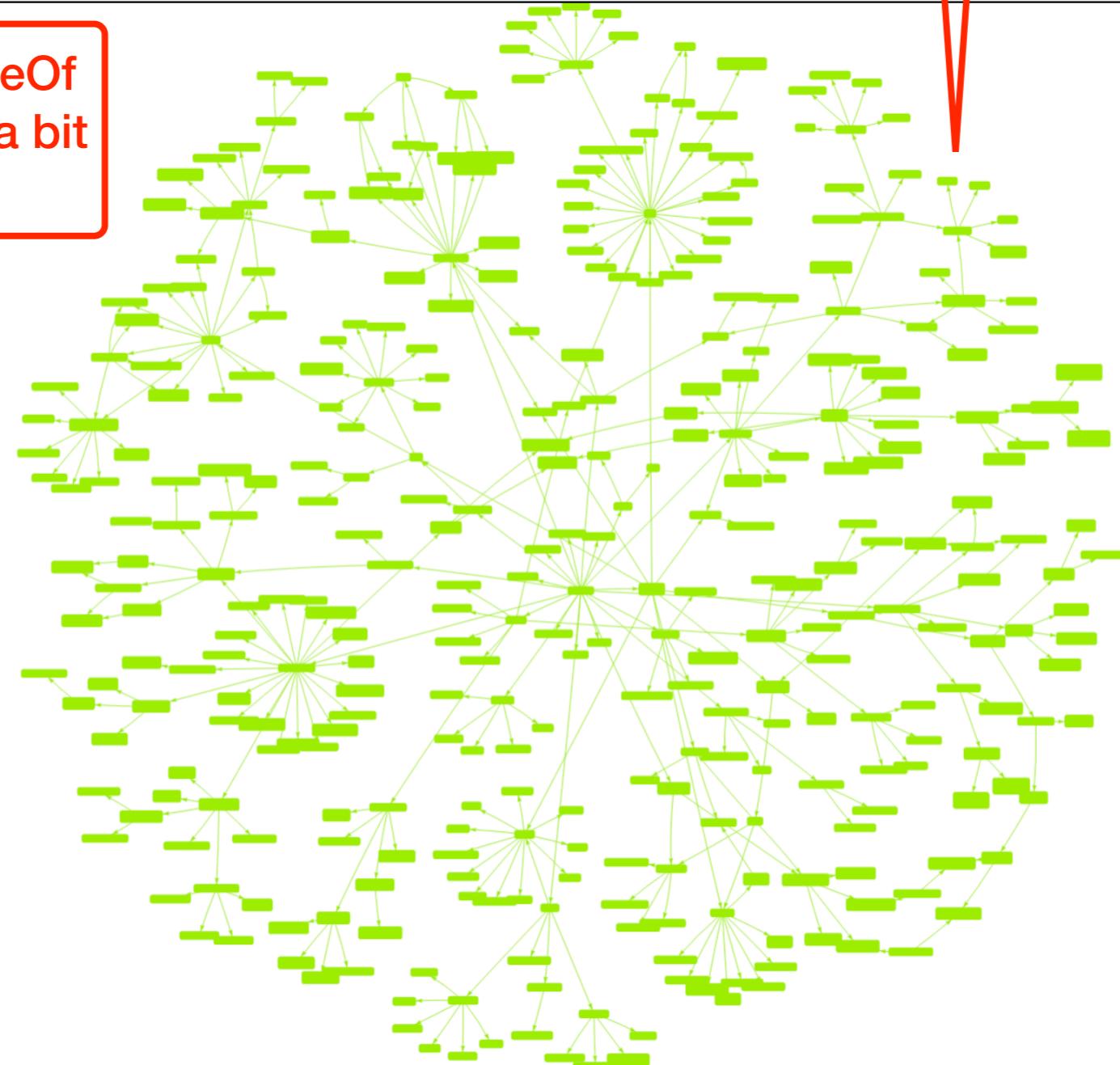
Graph: SubtypeOf ConstituentOf HeadOf

Show: **Stabilize:** Atlas2 grow: remove:

Selection: expand: search:

We select just SubtypeOf
to make this example a bit
simpler

For a more complex example, we'll
replicate Tree 5 of the Construction
Relations (only SubtypeOf relations)



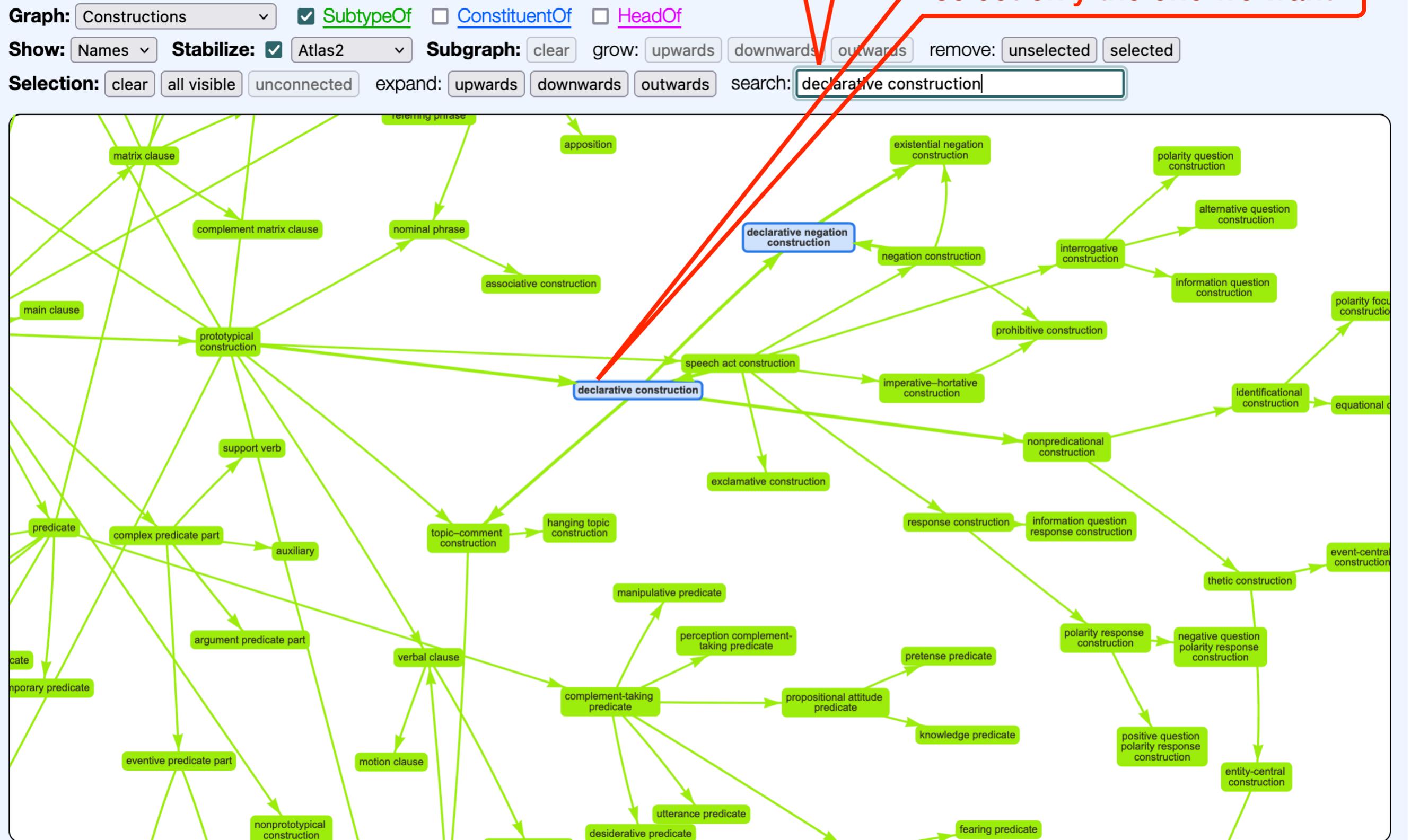
Current graph: 354 nodes; 396 edges

Visualization of the Comparative Concepts database

► Instructions

Search on “declarative construction”

This yields two nodes; we will select only the one we want



Current graph: 354 nodes, 2 selected; 396 edges

Selected: declarative construction, declarative negation construction

Visualization of the Comparative Concepts database

Clicking on remove: unselected gives us our starting point

► Instructions

Graph: SubtypeOf ConstituentOf HeadOf

Show: **Stabilize:** **Atlas2** clear grow: remove:

Selection: expand: search:

declarative construction

Current graph: 1 nodes (of 354), 1 unconnected, 1 selected; 0 edges (of 396)

Visualization of the Comparative Concepts database

► Instructions

Graph: Constructions ▾

SubtypeOf

ConstituentOf

HeadOf

Show: Names ▾

Stabilize: Atlas2 ▾

Subgraph: clear

grow: upwards

downwards

outwards

remove: unselected

selected

Selection: clear

all visible

unconnected

expand: upwards

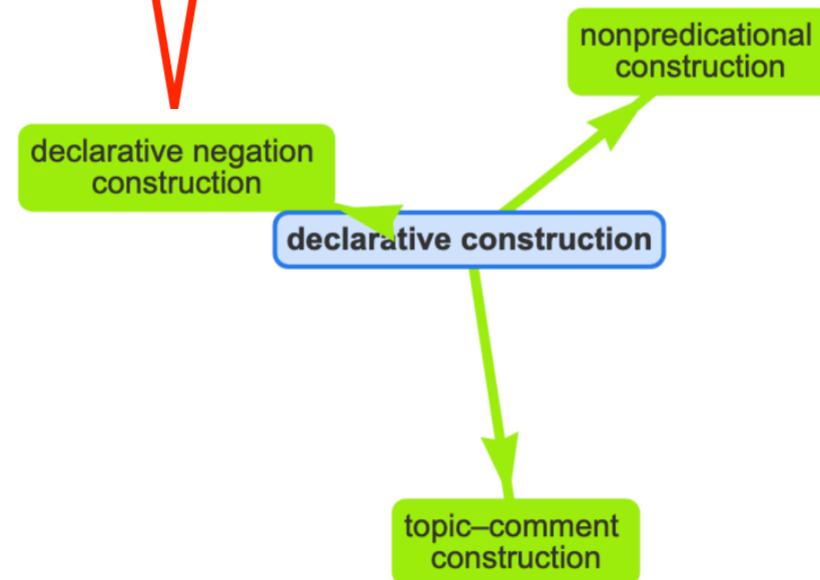
downwards

outwards

search: declarative construction

Clicking on grow: downwards
grows the taxonomy one step

There's a branch we aren't interested in, but we'll grow another step or two first; it's easier to "prune" a branch after we've grown the subgraph most or all of the way



Visualization of the Comparative Concepts database

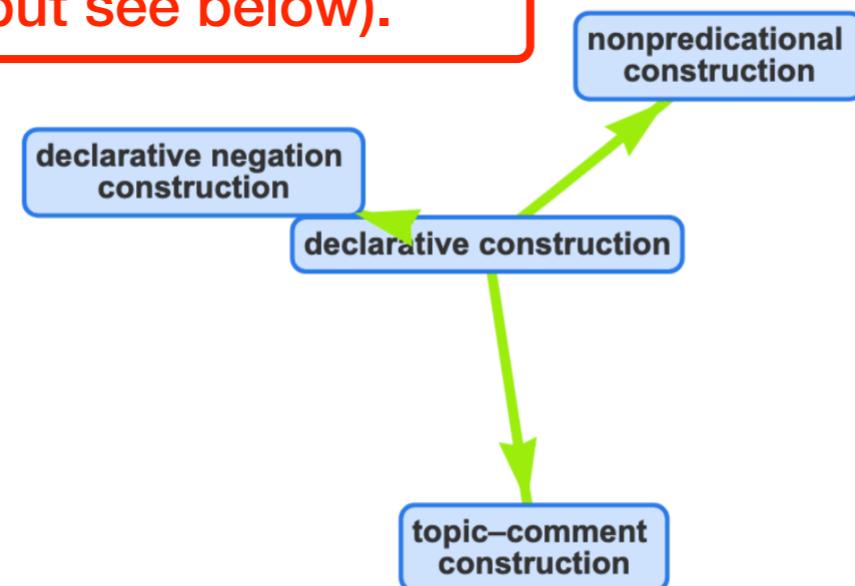
► Instructions

Graph: [SubtypeOf](#) [ConstituentOf](#) [HeadOf](#)

Show: Stabilize: Atlas2 clear grow: remove:

Selection: expand: search:

To expand the subgraph from all nodes, click expand: downwards as before. The subgraph grows only from the selected nodes in the graph (but see below).



We've grown the subgraph downward one step. The selected CCs remains the same. As before, we grow it another step by clicking expand: downwards and then grow: downwards

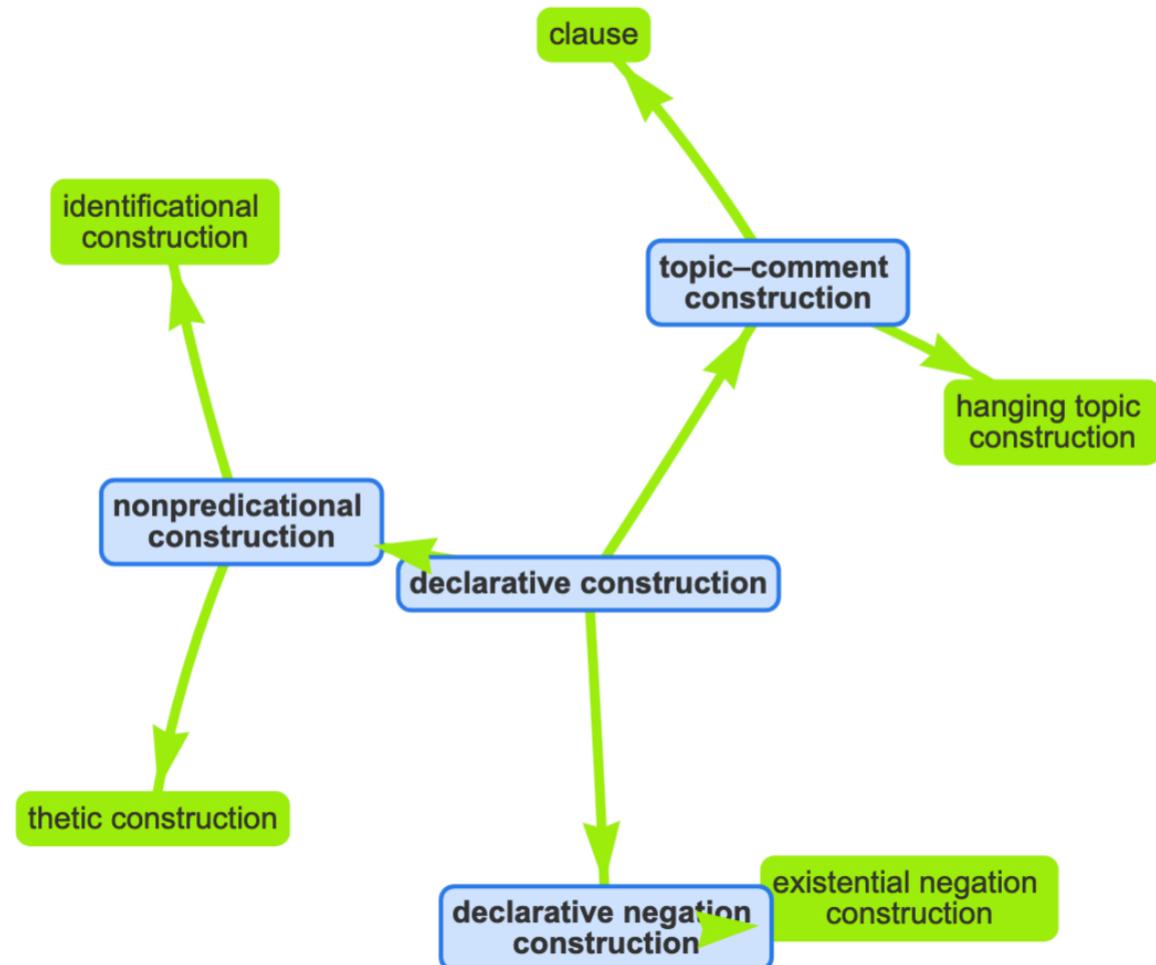
Visualization of the Comparative Concepts database

► Instructions

Graph: Constructions SubtypeOf ConstituentOf HeadOf

Show: Names Stabilize: Atlas2 Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: expand: upwards downwards outwards search: declarative construction



We've grown the subgraph downward two steps. But there are now a few branches we want to "prune"

Visualization of the Comparative Concepts database

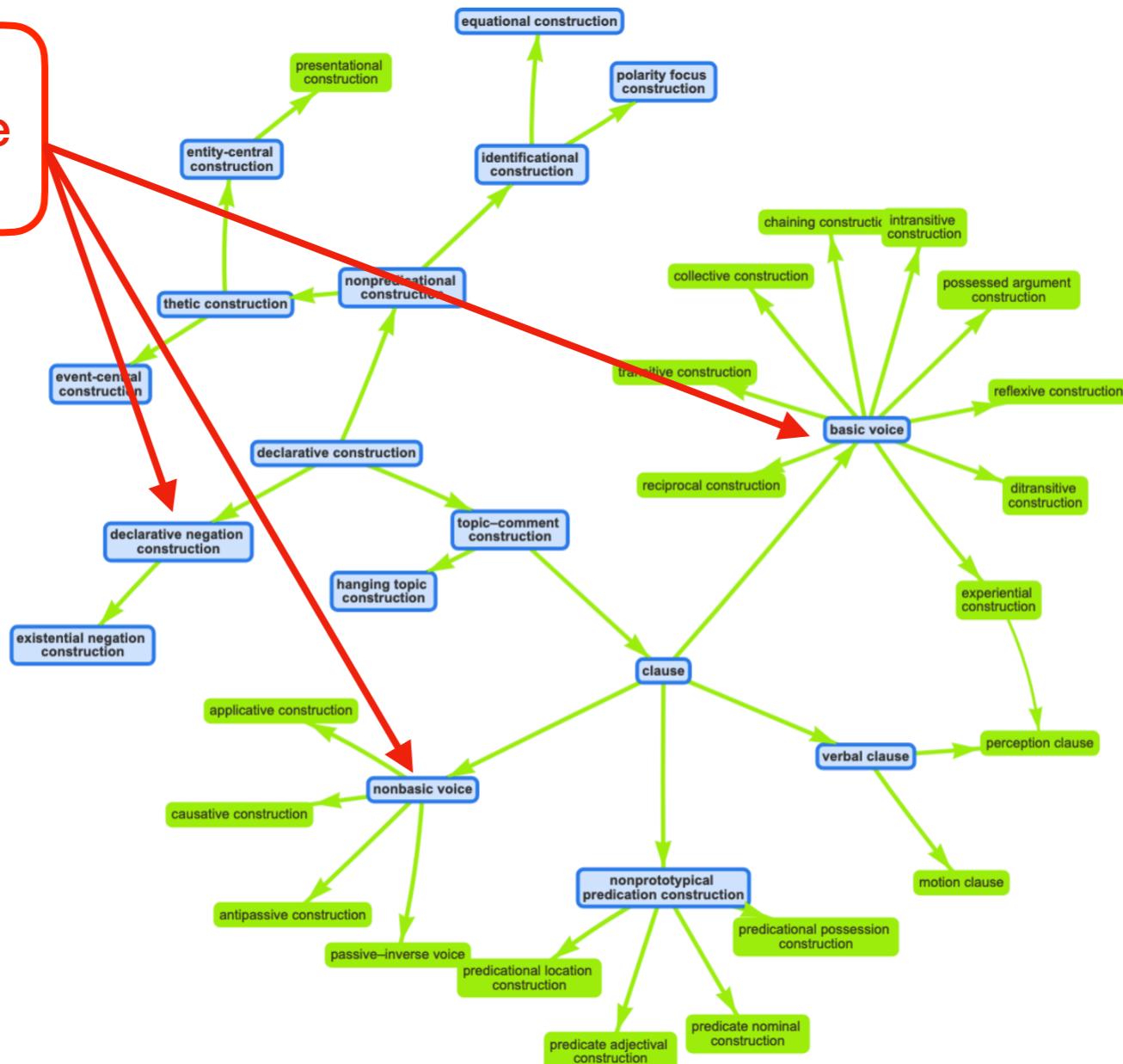
► Instructions

Graph: **Constructions** SubtypeOf ConstituentOf HeadOf

Show: **Names** **Stabilize:** **Atlas2** **Subgraph:** **clear** grow: **upwards** **downwards** **outwards** remove: **unselected** **selected**

Selection: **clear** **all visible** **unconnected** expand: **upwards** **downwards** **outwards** search: **declarative construction**

we want to
prune these
branches



Visualization of the Comparative Concepts database

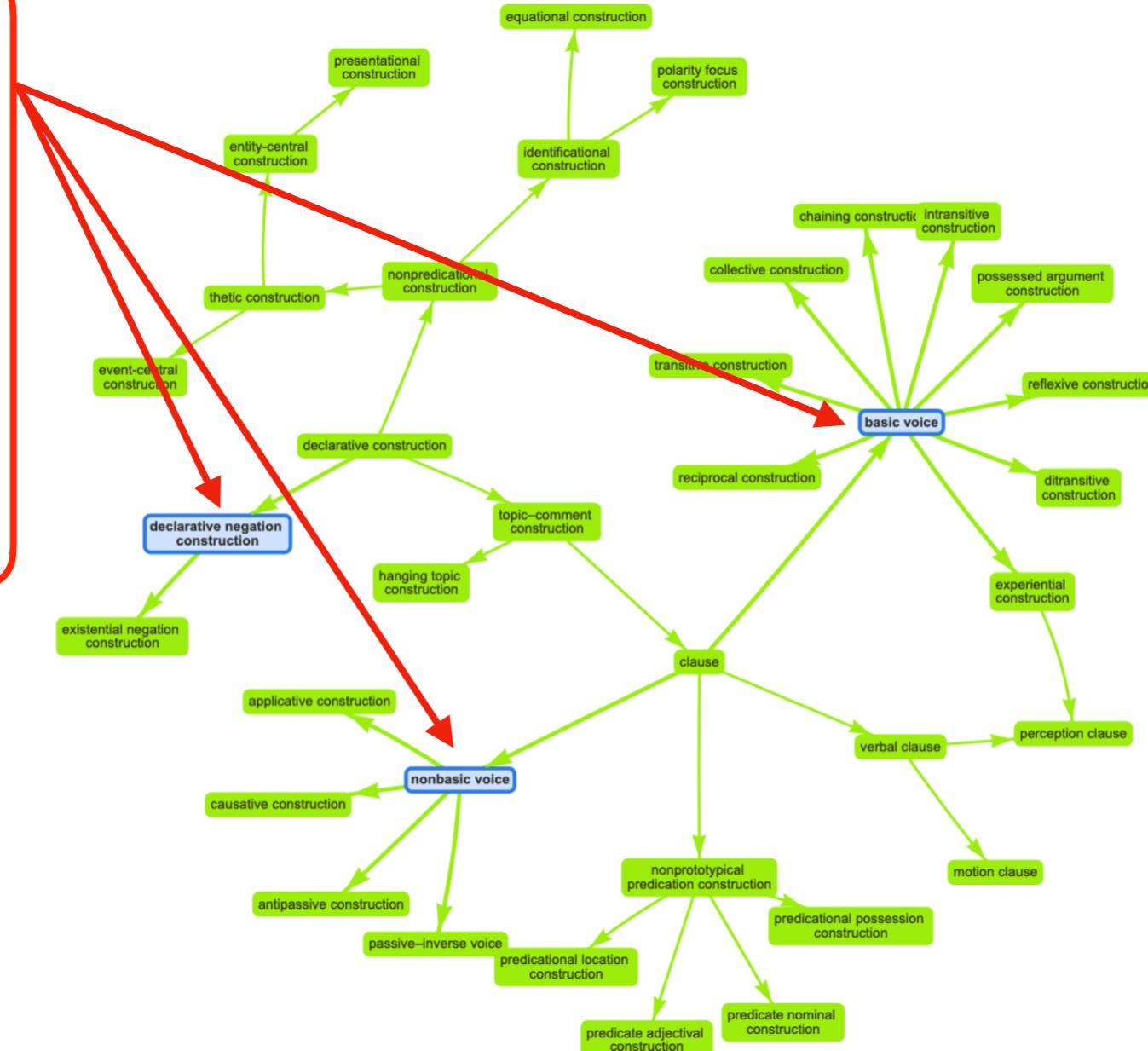
► Instructions

Graph: SubtypeOf ConstituentOf HeadOf

Show: Stabilize: Atlas2 clear grow: upwards downwards outwards remove: unselected selected

Selection: expand: upwards downwards outwards search: declarative construction

first, we select the top node of each branch we want to prune, by clicking and then holding briefly so as not to deselect the first nodes we clicked



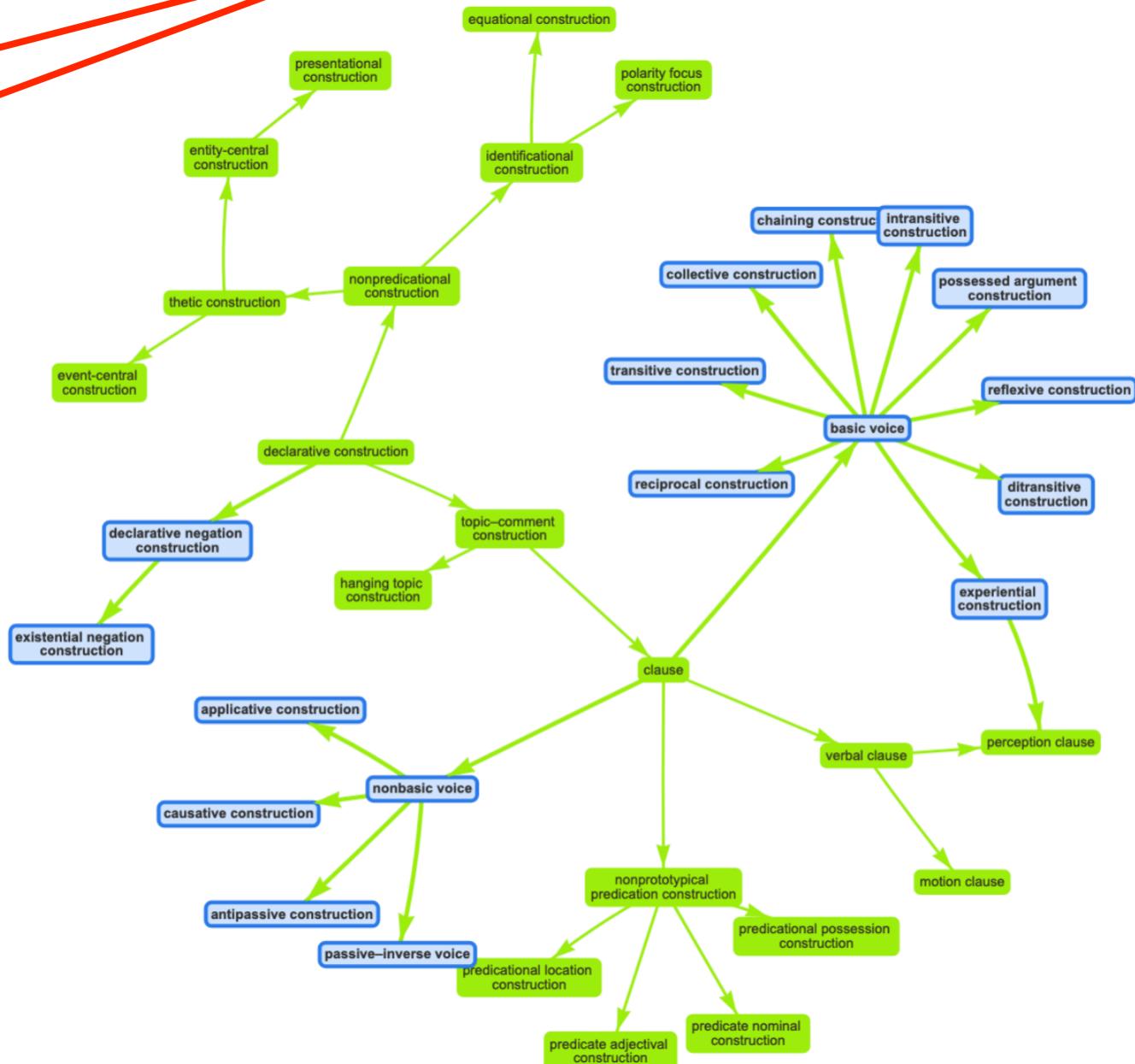
Visualization of the Comparative Concepts database

Third, click on remove: selected to “prune” the unwanted branches (see next slide)

► Instructions

Graph: Constructions SubtypeOf ConstituentOf HeadOf
Show: Names Atlas2 grow: upwards downwards outwards remove: unselected selected
Selection: clear all visible unconnected expand: upwards downwards outwards search: declarative construction

Second, click on expand: downwards to select the child nodes. (Click more than once to expand more steps down the branch if necessary.)



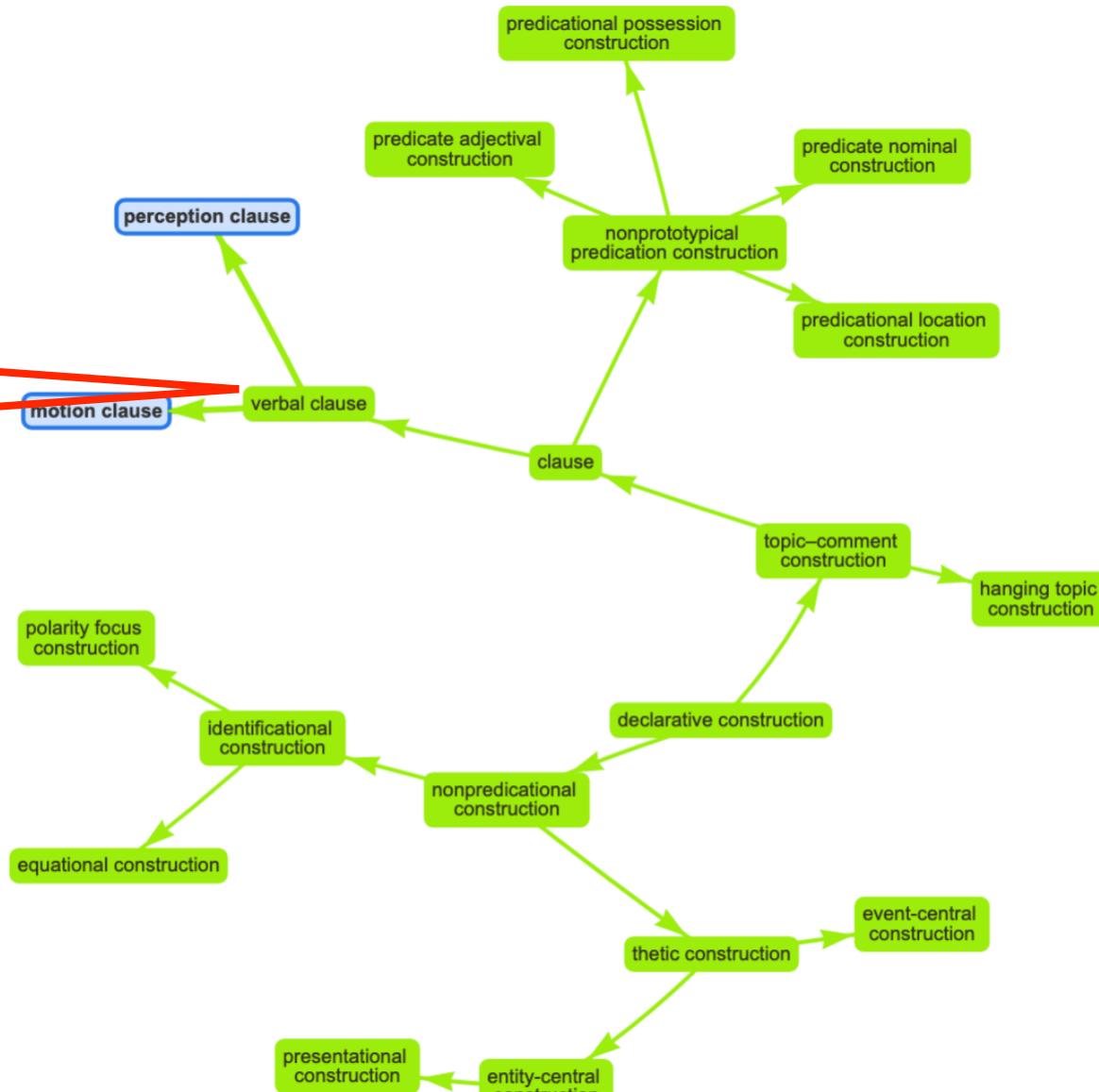
Visualization of the Comparative Concepts database

► Instructions

Graph: **Constructions** SubtypeOf ConstituentOf HeadOf
Show: Names Stabilize: Atlas2 Subgraph: clear grow: upwards downwards outwards remove: unselected selected
Selection: clear all visible unconnected expand: upwards downwards outwards search: declarative construction

Then, click on remove: selected to “prune” the unwanted branches (see next slide)

We want to keep this top node, but not its branches. We can just select each child node. If there are a lot of child nodes, we can select the top node, click expand: downwards as many times as needed, then deselect the top node by click and holding down briefly. Then we remove: selected



We know that 'presentational construction' has subtypes, so we click on this node and then click grow: downwards to add those nodes

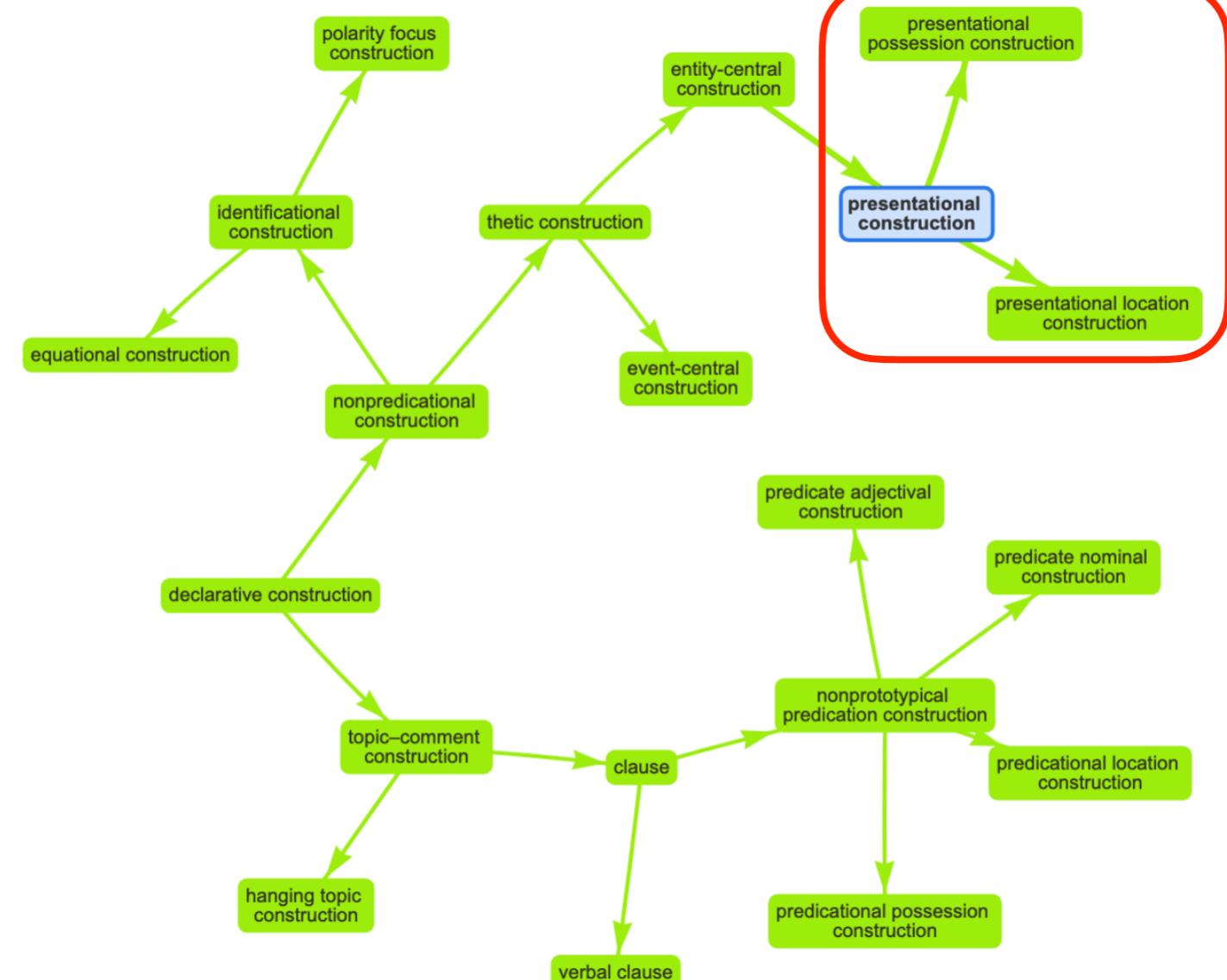
Visualization of the Comparative Concepts database

► Instructions

Graph: Constructions SubtypeOf ConstituentOf HeadOf

Show: Names Atlas2 clear grow: upwards downwards outwards remove: unselected selected

Selection: expand: upwards downwards outwards search: declarative construction



We want to see what parts (heads and other constituents) these constructions have, but without adding in the subtypes we pruned. So we toggle on ConstituentOf and HeadOf, and toggle off SubtypeOf

Visualization of the Comparative Concepts database

► Instructions

Graph: Constructions SubtypeOf ConstituentOf HeadOf

Show: Names Stabilize: Atlas2 Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: clear all visible unconnected expand: upwards downwards outwards search: declarative construction

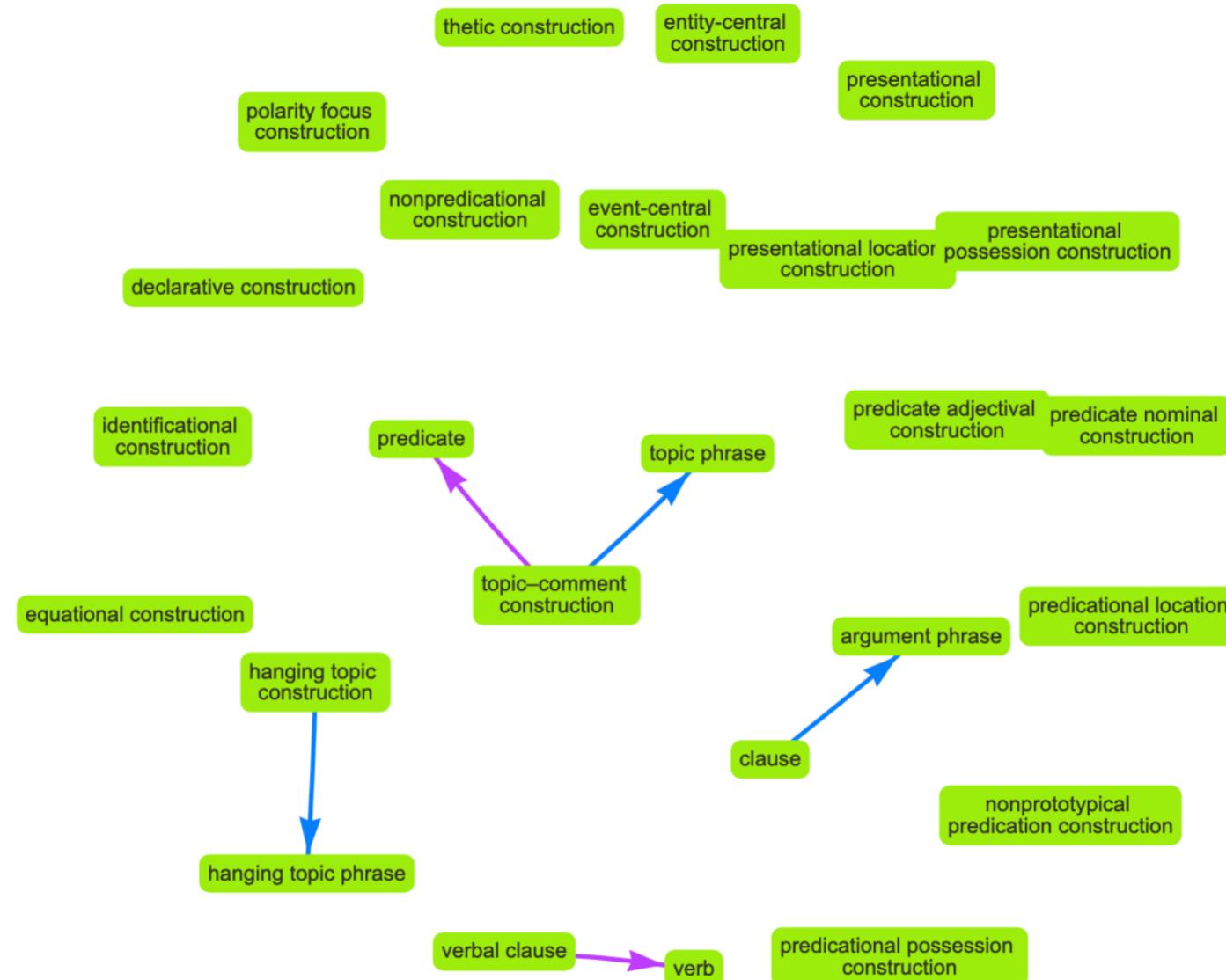


Visualization of the Comparative Concepts database

Then we grow: downwards (if no node is selected at all, the entire graph is grown)

► Instructions

Graph: [SubtypeOf](#) [ConstituentOf](#) [HeadOf](#)
Show: **Stabilize:** grow: remove:
Selection: expand: search:



Current graph: 25 nodes (of 354), 16 unconnected; 5 edges (of 92)

Then we toggle back on SubtypeOf to see the taxonomy again

Visualization of the Comparative Concepts database

► Instructions

Graph: Constructions SubtypeOf ConstituentOf HeadOf

Show: Names Stabilize: Atlas2 Subgraph: grow: remove:

Selection: expand: search:



You can “prune” nodes joined by only a subset of relations without losing the nodes joined by other relations:

- (i) toggle relations on or off to get only the relations you want to prune;
- (ii) prune those branches by selecting, expanding, remove: selected;
- (iii) restore the relation(s) you want to keep

Visualization of the Comparative Concepts database

► Instructions

Graph: **Constructions**

SubtypeOf ConstituentOf HeadOf

Show: **Names**

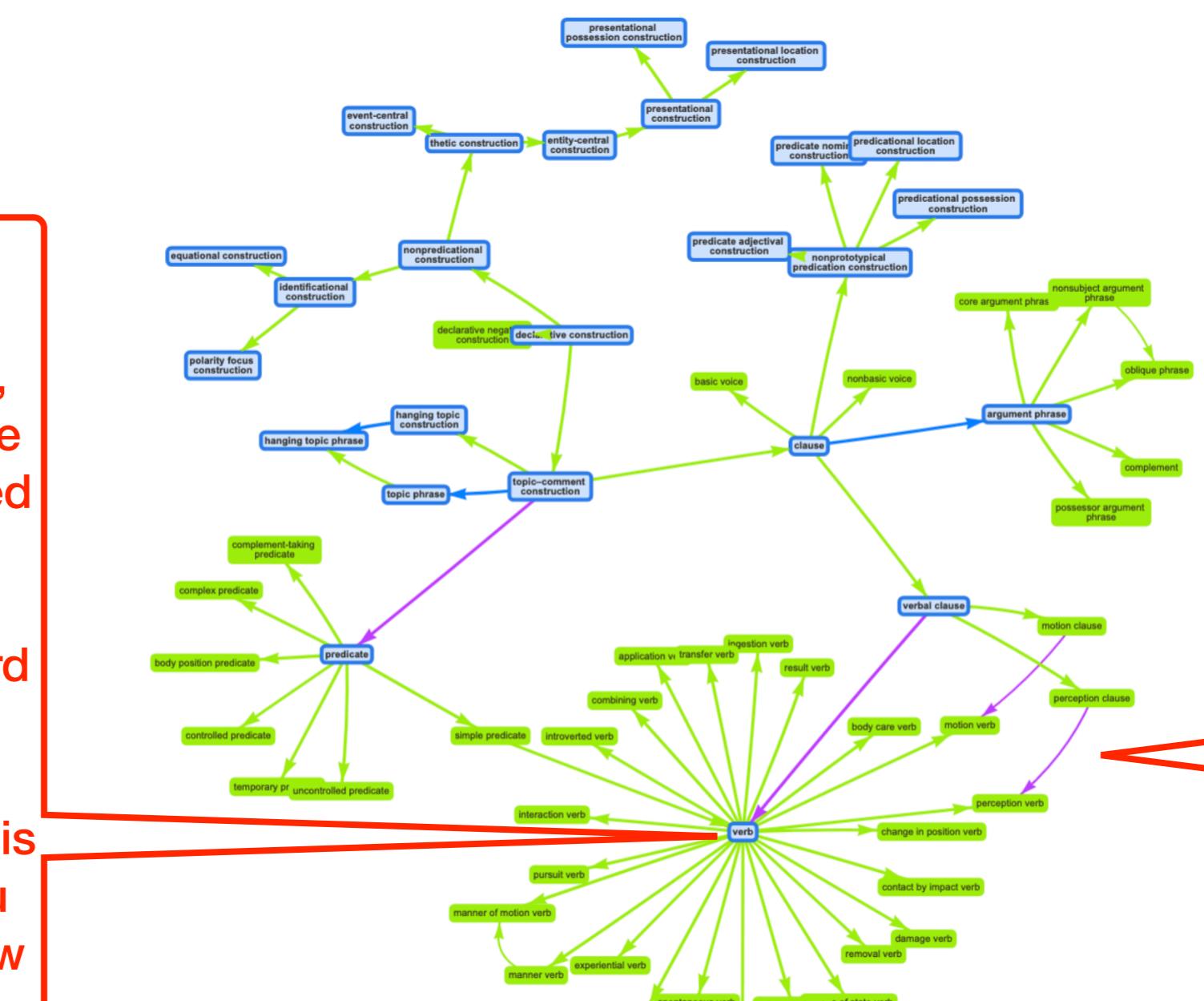
Stabilize:

Subgraph: grow: remove:

Selection: expand: search:

Let's say you expanded your subgraph too far, and got a lot more than you bargained for. If you expanded by **expand: downward** and **grow: downward**, your original subgraph is selected and you can undo the grow by clicking **remove: unselected**

However, if you expanded by **select: clear** and **grow: downward**, your original subgraph is not selected, and you can't undo the grow



Summary so far

- This will get you most of what you want to do, albeit sometimes with a fair number of clicks
- You can play around with the nodes selected, then remove either selected or unselected nodes
- You can turn relations on or off and grow or remove parts of the graph based on the selected relations; and then turn back on the unselected relations and those relations will be restored to your graph
- If your exploring leads to a few unconnected nodes you don't want, you can Select: unconnected and then remove: selected to get rid of them
- Sometimes you might want to, or have to, start all over again. Under Subgraph, click clear. You might also have to delete any term in the Selection:search box

Construction strategies and
functions

Finding construction strategies and functions

- For the construction-strategy relations and the construction-function relations, the relevant relation is given only once in the construction taxonomy, and the strategy or function is "inherited" by constructions below that node in the construction taxonomy
- We have not (yet) implemented an “inherit” process that propagates strategies and functions down the construction taxonomy (sorry!)
- So you will have to use the commands described in the preceding slides to find strategies or functions that are associated only with a construction higher in the taxonomy but apply to the construction you’re interested in

Example: strategies for the
transitive construction

Finding strategies for constructions

- If you want to know all the strategies that are in the database for a particular construction, you will have to grow the construction taxonomy upwards from the construction you are interested in (NB: constructions may have multiple parents). Then you will be able to find other strategies that the construction could be expressed by
- Inheritance might produce possible strategies for a particular construction subtype that aren't actually attested. But the strategies in the database are defined in very general ways and are not intended to be comprehensive — just the more commonly occurring strategies across languages

Select the graph that displays constructions and their strategies

Visualization of the Comparative Concepts database

► Instructions

This graph defaults to just the ExpressionOf relation

Graph: Cxn ⇄ Strategies

SubtypeOf

ExpressionOf

ModeledOn

RecruitedFrom

Show: Names

Stabilize:

Atlas2

Subgraph:

clear

grow: upwards

downwards

outwards

remove: unselected selected

Selection:

clear

all visible

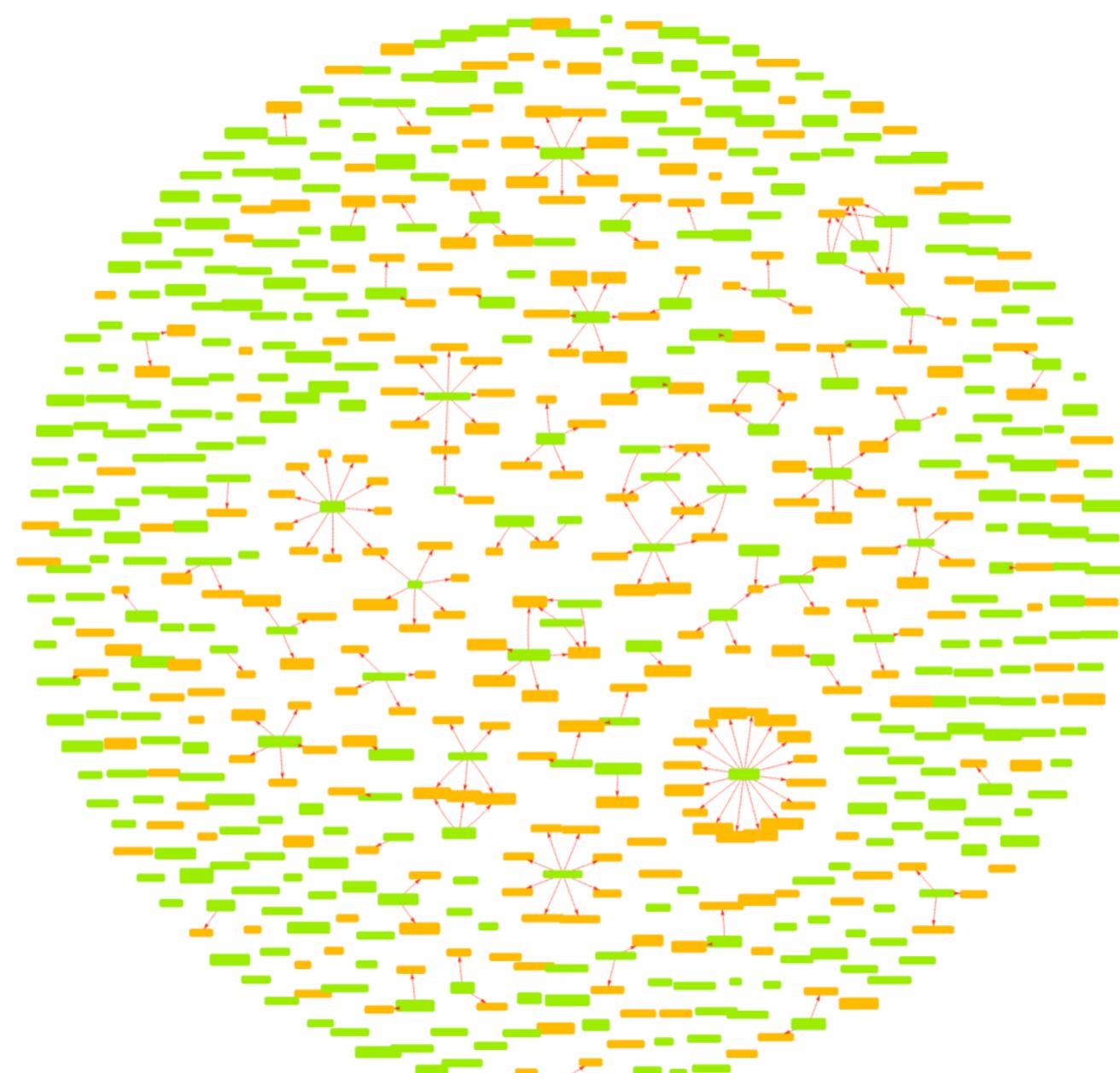
unconnected

expand: upwards

downwards

outwards

search: Type at least 3 characters



Current graph: 628 nodes, 366 unconnected; 217 edges

Search on the construction you're interested in and select it from the options

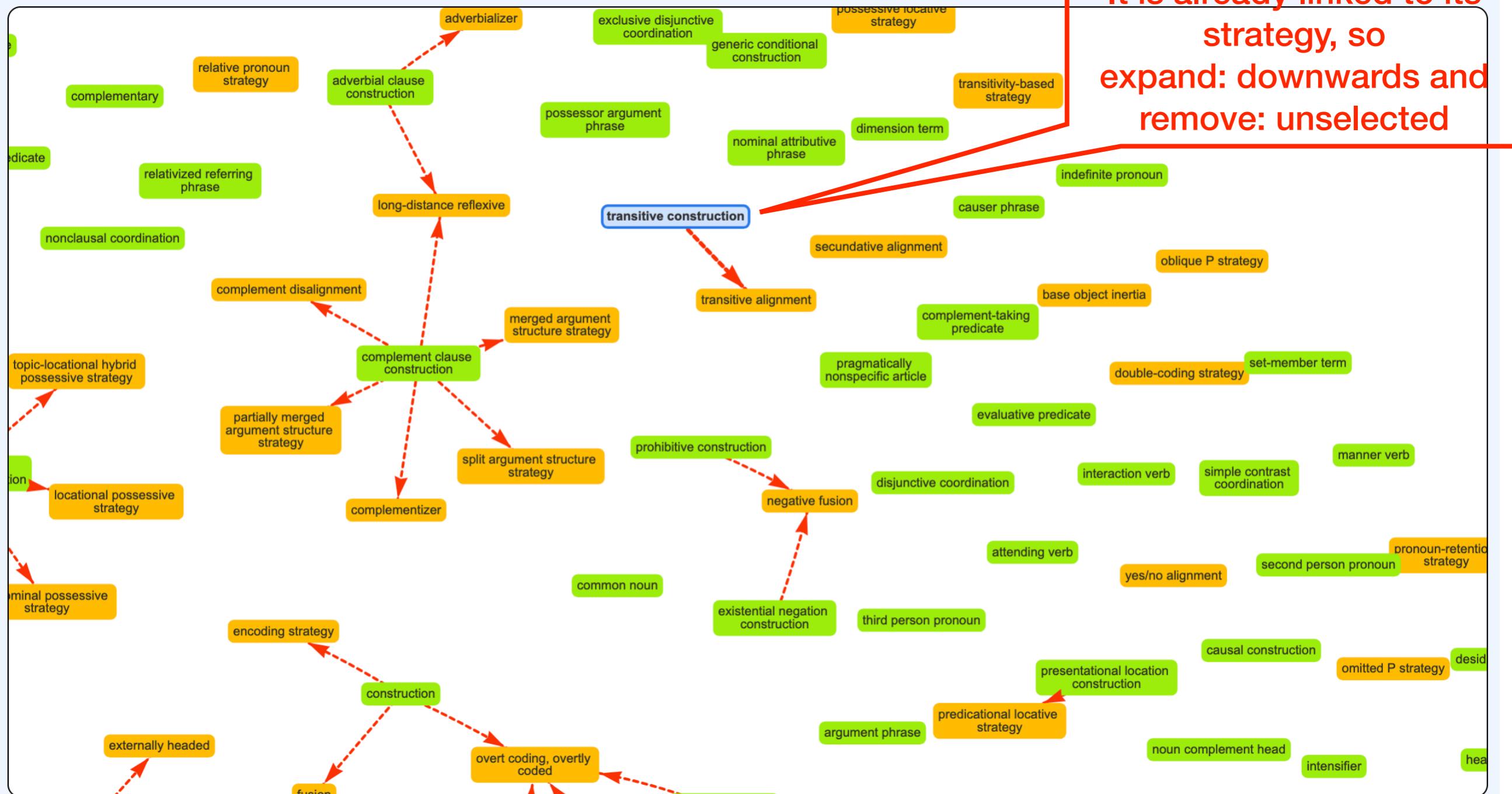
Visualization of the Comparative Concepts database

► Instructions

Graph: Cxn ↔ Strategies ▾ SubtypeOf ExpressionOf ModeledOn RecruitedFrom

Show: Names ▾ Stabilize: Atlas2 ▾ Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: clear all visible unconnected expand: upwards downwards outwards search: transitive construction



Current graph: 628 nodes, 366 unconnected, 1 selected; 217 edges

Visualization of the Comparative Concepts database

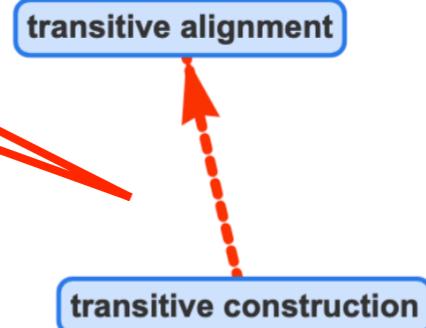
► Instructions

Graph: Cxn ↔ Strategies ▾ SubtypeOf ExpressionOf ModeledOn RecruitedFrom

Show: Names ▾ Stabilize: Atlas2 ▾ Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: clear all visible unconnected expand: upwards downwards outwards search: transitive construction

This is our starting point



We first want more information about the transitive alignment strategy. So we toggle on SubtypeOf, ModeledOn and RecruitedFrom and toggle off ExpressionOf

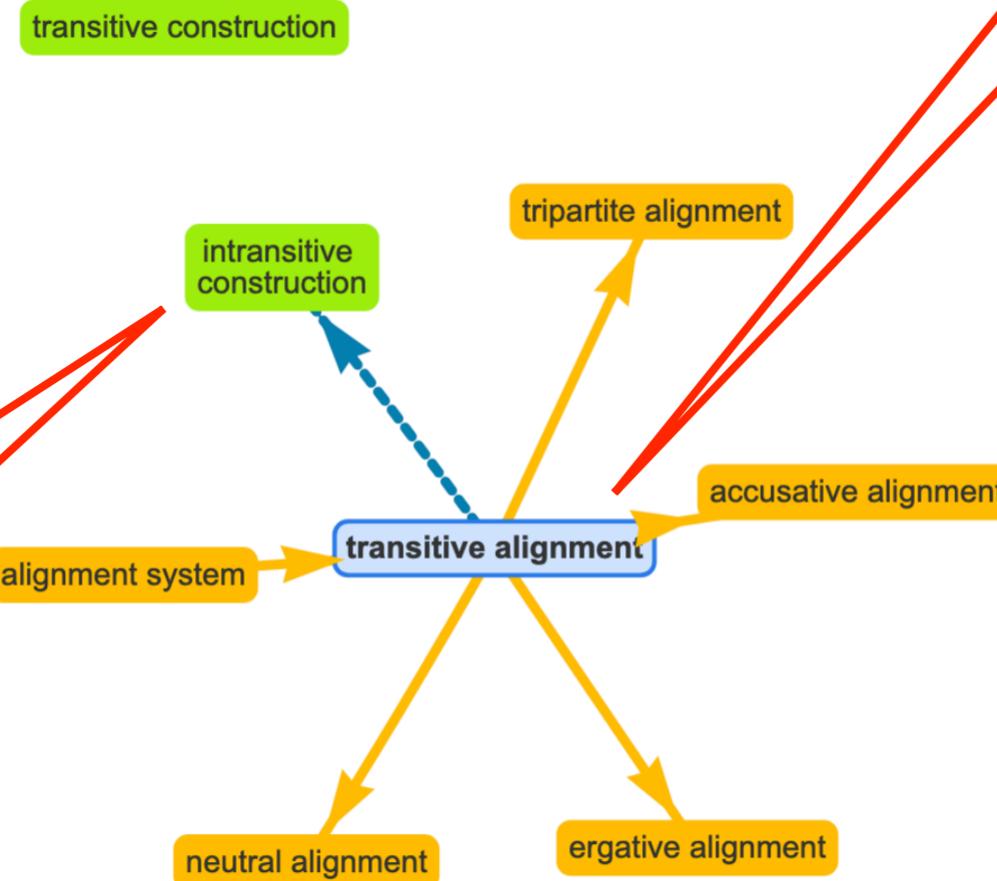
Visualization of the Comparative Concepts database

Instructions

Graph: Cxn ↔ Strategies SubtypeOf ExpressionOf ModeledOn RecruitedFrom

Show: Names Stabilize: Atlas2 Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: clear all visible unconnected expand: upwards downwards outwards search: transitive construction



The strategies are modeled on the intransitive construction (i.e. how transitive A and P are encoded in comparison to how intransitive S is encoded)

Then we select just the transitive alignment node, and grow: outwards

The new strategy nodes enumerate the common alignment strategies for the transitive construction

Now we want to see what strategies might be inherited by the transitive construction. We toggle off ModeledOn and RecruitedFrom

Visualization of the Comparative Concepts database

► Instructions

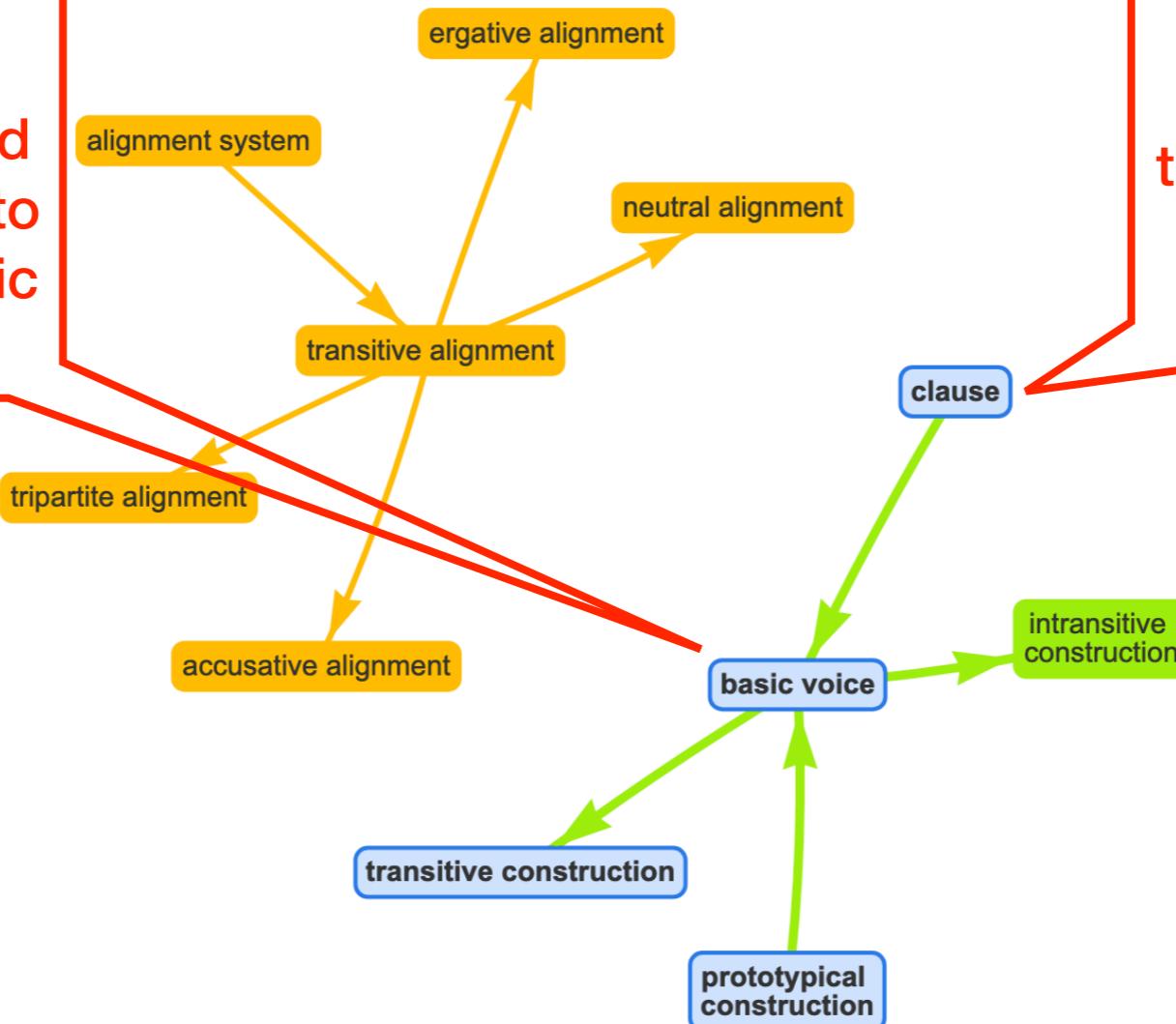
Graph: Cxn ↔ Strategies ▾ SubtypeOf ExpressionOf ModeledOn RecruitedFrom

Show: Names ▾ Stabilize: Atlas2 ▾ Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: clear all visible unconnected expand: upwards downwards outwards search: Type at least 3 characters

We selected transitive construction and grow: upwards and expand: upwards to get its parent, basic voice

Then grow: upwards and expand: upwards to to get the grandparents of the transitive construction



Then toggle on ExpressionOf, and toggle off SubtypeOf in order to avoid getting sibling and cousin constructions to transitive construction

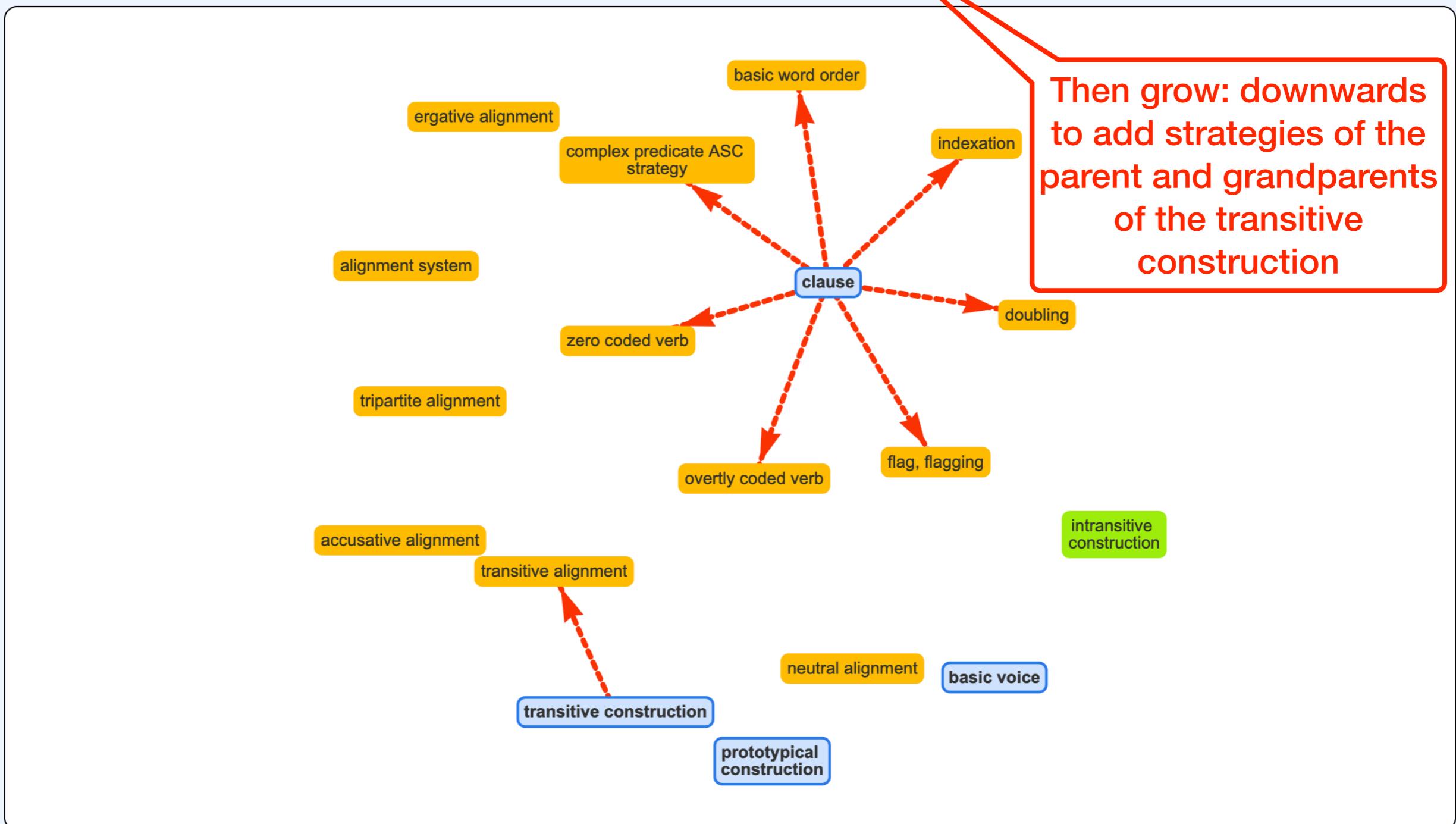
Visualization of the Comparative Concepts database

► Instructions

Graph: Cxn \leftrightarrow Strategies SubtypeOf ExpressionOf ModeledOn RecruitedFrom

Show: Names ✓ Stabilize: Atlas2 ✓ Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: **expand:** **search:**



Then grow: downwards
to add strategies of the
parent and grandparents
of the transitive
construction

Then toggle on SubtypeOf, ModeledOn and RecruitedFrom again

Visualization of the Comparative Concepts database

Instructions

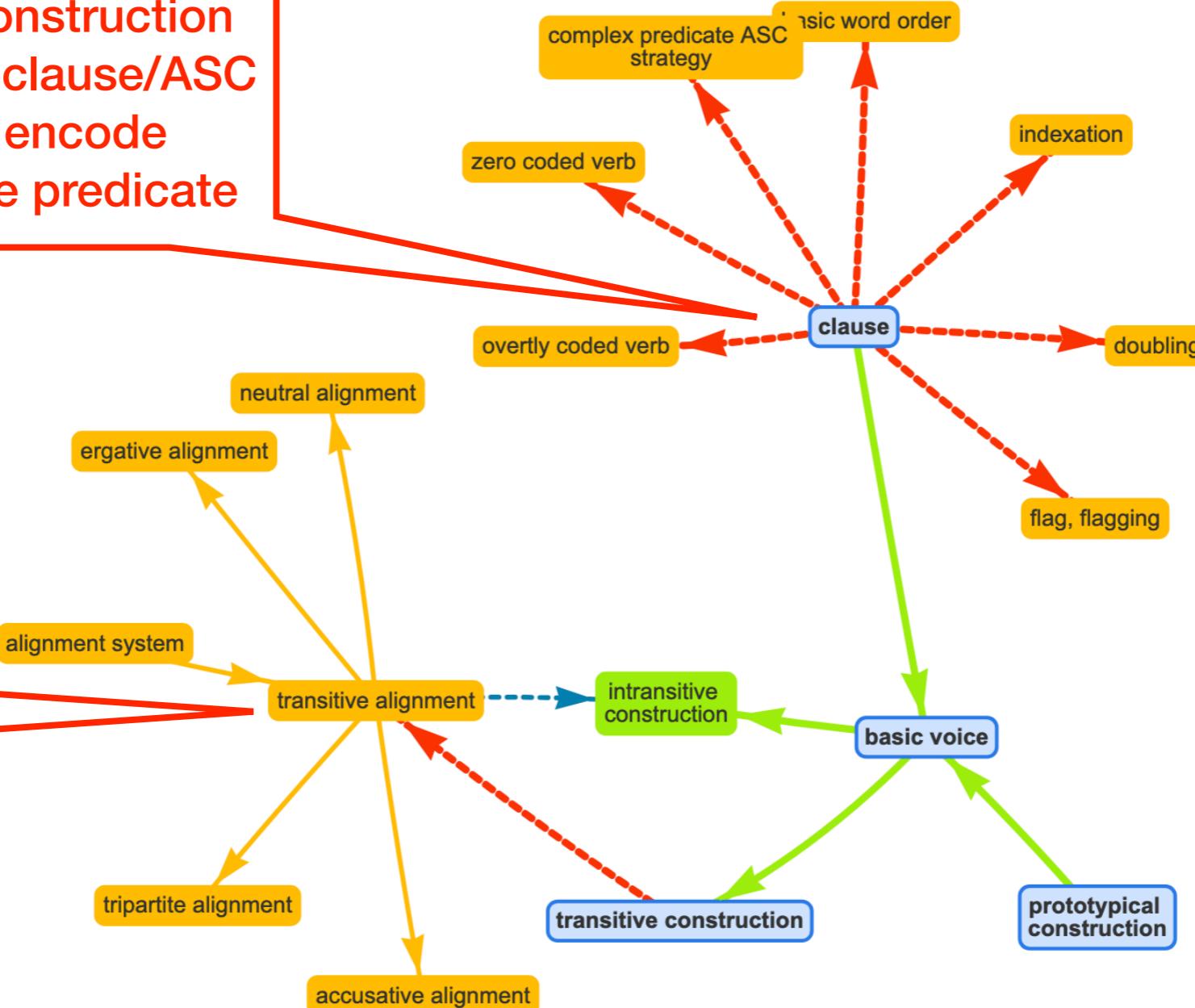
Graph: Cxn ↔ Strategies SubtypeOf ExpressionOf ModeledOn RecruitedFrom

Show: Names Stabilize: Atlas2 Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: clear all visible unconnected expand: upwards downwards outwards search: Type at least 3 characters

The transitive construction uses the general clause/ASC strategies to encode arguments of the predicate

The specifically transitive alignment strategies are still listed here



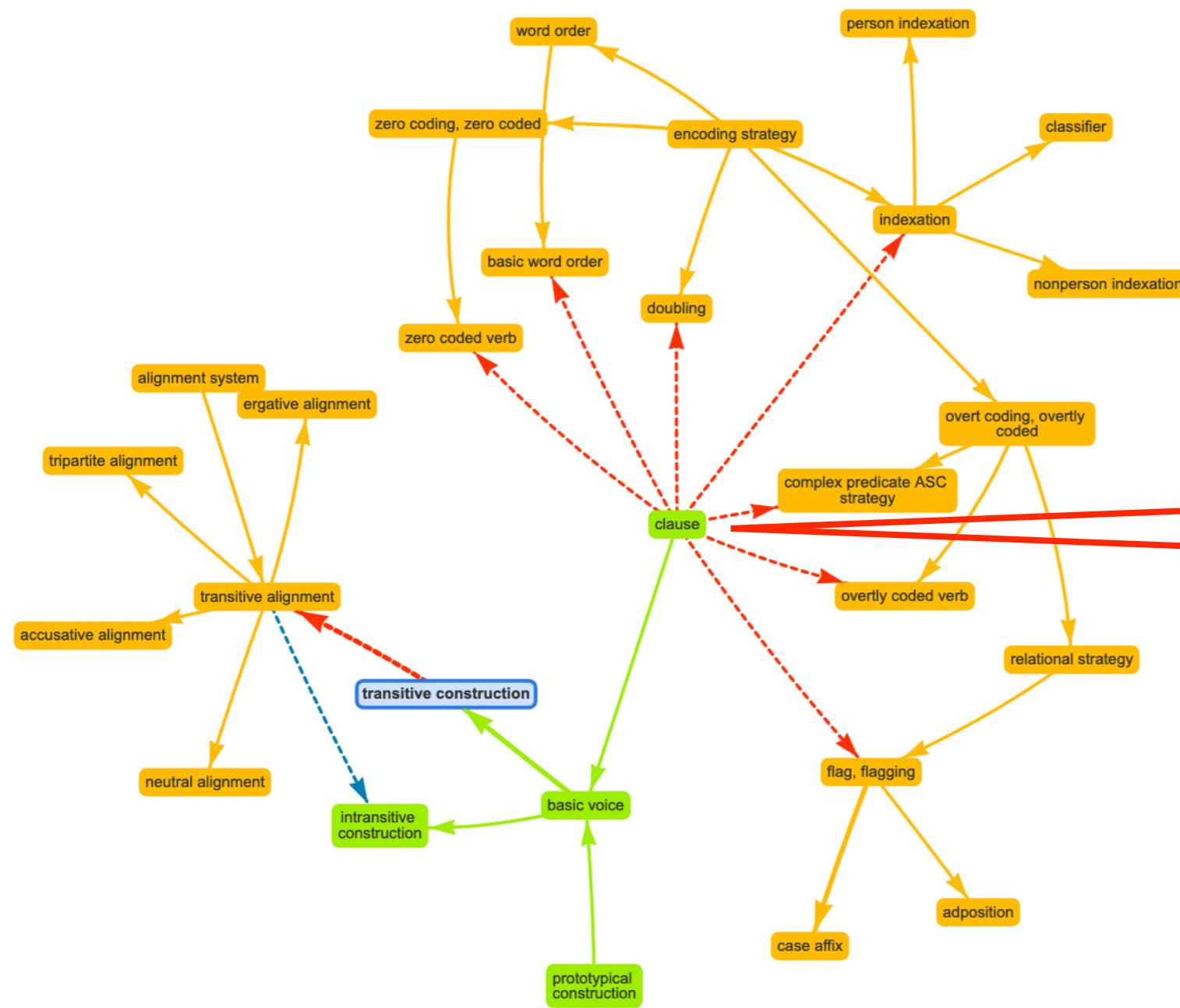
Visualization of the Comparative Concepts database

► Instructions

Graph: Cxn ↔ Strategies ▼ SubtypeOf ExpressionOf ModeledOn RecruitedFrom

Show: Names ▼ Stabilize: Atlas2 ▼ Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: clear all visible unconnected expand: upwards downwards outwards search: transitive



We can also flesh out the taxonomy of the clause strategies by selecting clause; expand: downwards; then deselect clause and basic voice; toggle off all relations except SubtypeOf; grow: outwards; and toggle on the other relations

Example: function of the
ditransitive construction

Finding functions of constructions

- For construction functions, it's a bit more complicated. Some functions are associated with the construction as a whole. These functions may also be inherited from a construction higher in the taxonomy. For example, noun phrases have the function of reference (inf) to objects (sem). However, noun phrases inherit the reference function from its parent, referring phrase. Finding these functional specifications works the same way as finding additional strategies just shown
- However, some functions of a construction are also associated with the construction parts. For example, the function of a quantification construction (quantifier + head noun) is primarily defined by the semantics of the modifying quantifier; the construction as a whole has only the function of reference to an entity (which is inherited from the function of referring phrases in general). We call this “pseudo-inheritance”
- In order to find the construction functions that are associated with its parts, you have to grow the ConstituentOf and HeadOf relations downward from the construction you are interested in -- and also downward from constructions higher in the taxonomy, since their parts may have functions inherited by the parts of the construction you are interested in

Select the graph that displays constructions and their functions

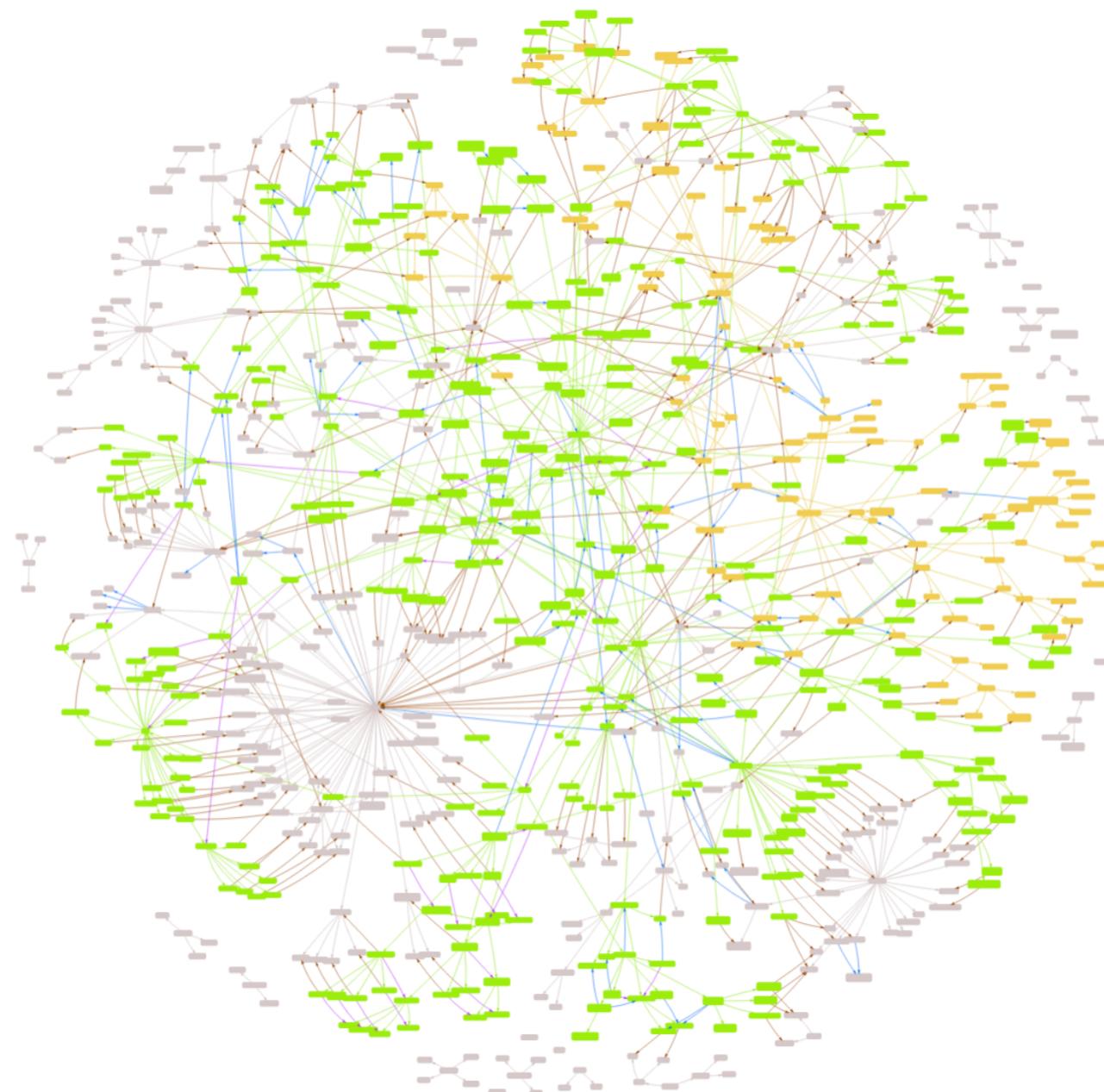
Visualization of the Comparative Concepts database

► Instructions

Graph: Cxn ↔ Sem. + Inf. SubtypeOf ConstituentOf HeadOf FunctionOf

Show: Names Stabilize: Atlas2 Subgraph: grow: remove:

Selection: expand: search:



Current graph: 769 nodes, 6 unconnected; 1256 edges

Visualization of the Comparative Concepts database

► Instructions

Graph: Cxn ↔ Sem. + Inf. SubtypeOf ConstituentOf HeadOf FunctionOf

Show: Names Stabilize: Atlas2 Subgraph: grow: remove:

Selection: expand: search: ditransitive construction

Select the construction you're interested in by searching on its name...

ditransitive
construction

...selecting it, and
remove: unselected

To add the construction's parents, toggle off all but SubtypeOf

Visualization of the Comparative Concepts database

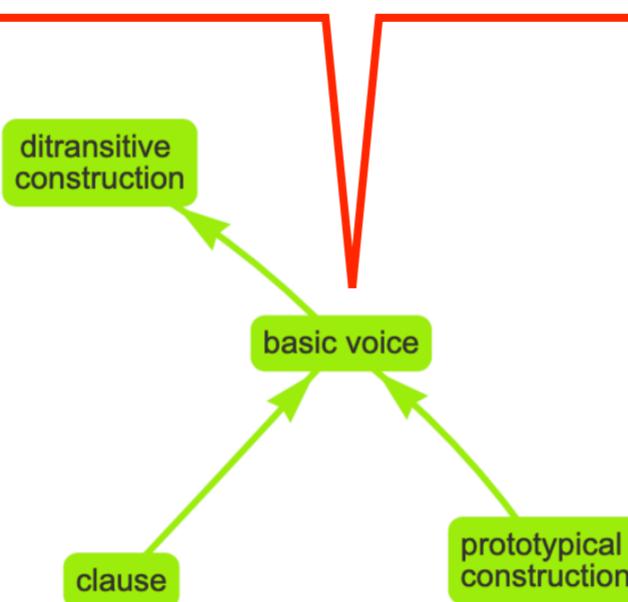
► Instructions

Graph: Cxn ↔ Sem. + Inf. SubtypeOf ConstituentOf HeadOf FunctionOf

Show: Names Stabilize: Atlas2 Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: clear all visible unconnected expand: upwards downwards outwards search: ditransitive construction

We added parents and grandparents, via grow: upwards,
Selection: clear, and grow: upwards again (this may be
repeated for higher nodes in the taxonomy)



Selection: clear is useful if you want to grow the entire graph, especially if there are unconnected nodes

Or you can use Selection: all visible, which allows you to “undo” by remove: unselected

To add functions, toggle on FunctionOf and toggle off SubtypeOf

Visualization of the Comparative Concepts database

► Instructions

Graph: Cxn ↔ Sem. + Inf. ▾

SubtypeOf

ConstituentOf

HeadOf

FunctionOf

Show: Names ▾

Stabilize: Atlas2 ▾

Subgraph: clear

grow: upwards downwards outwards

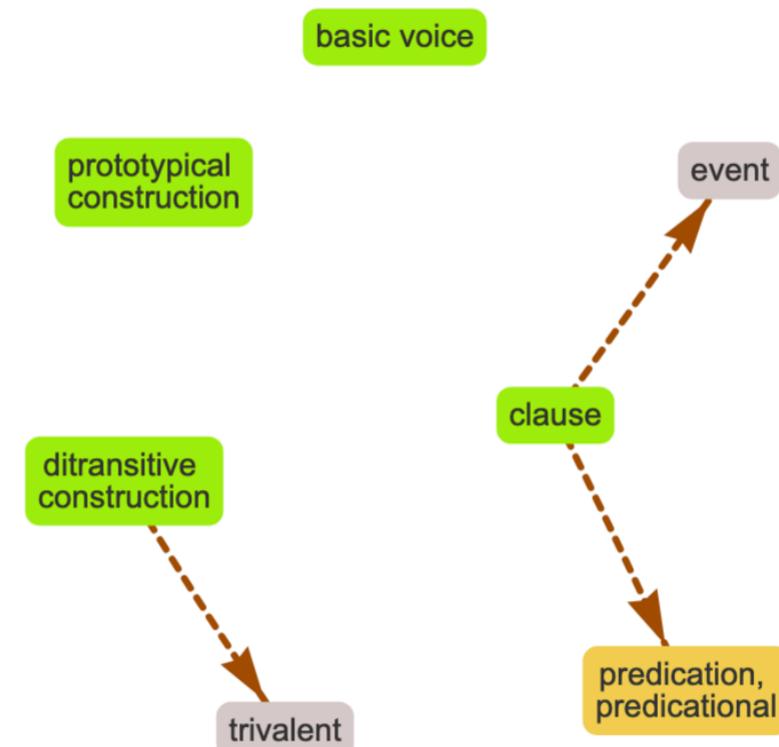
Then selection: clear if necessary,
then grow: downwards (just once)

remove: unselected selected

Selection: clear all visible unconnected

expand: upwards downwards outwards

search: ditransitive construction



To add construction parts, toggle on ConstituentOf and HeadOf and toggle off FunctionOf

Visualization of the Comparative Concepts database

► Instructions

Graph:

Cxn ↔ Sem. + Inf.

SubtypeOf

ConstituentOf

HeadOf

FunctionOf

Show:

Names

Stabilize: Atlas2

Subgraph:

clear

grow: upwards

downwards

outwards

remove: unselected

selected

Selection:

clear

all visible

unconnected

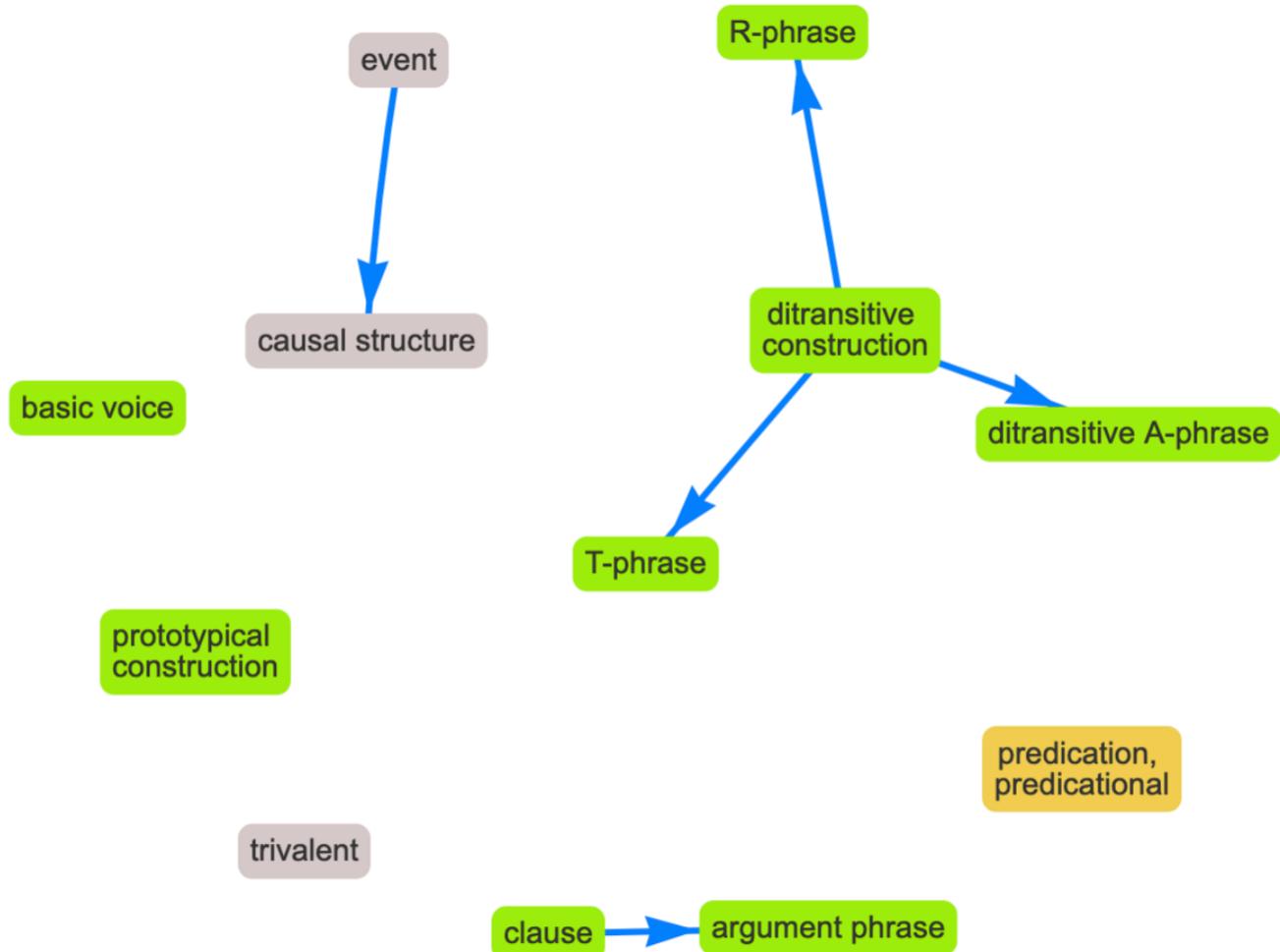
expand: upwards

downwards

outwards

search: ditransitive construction

Then selection: clear if necessary,
then grow: downwards (just once)



To add functions of the parts, toggle on FunctionOf and toggle off ConstituentOf and HeadOf

Visualization of the Comparative Concepts database

► Instructions

Graph:

Cxn ↔ Sem. + Inf. ▾

SubtypeOf

ConstituentOf

HeadOf

FunctionOf

Show:

Names ▾

Stabilize:

Atlas2 ▾

Subgraph:

clear

grow: upwards

downwards

outwards

remove: unselected selected

Selection:

clear

all visible

unconnected

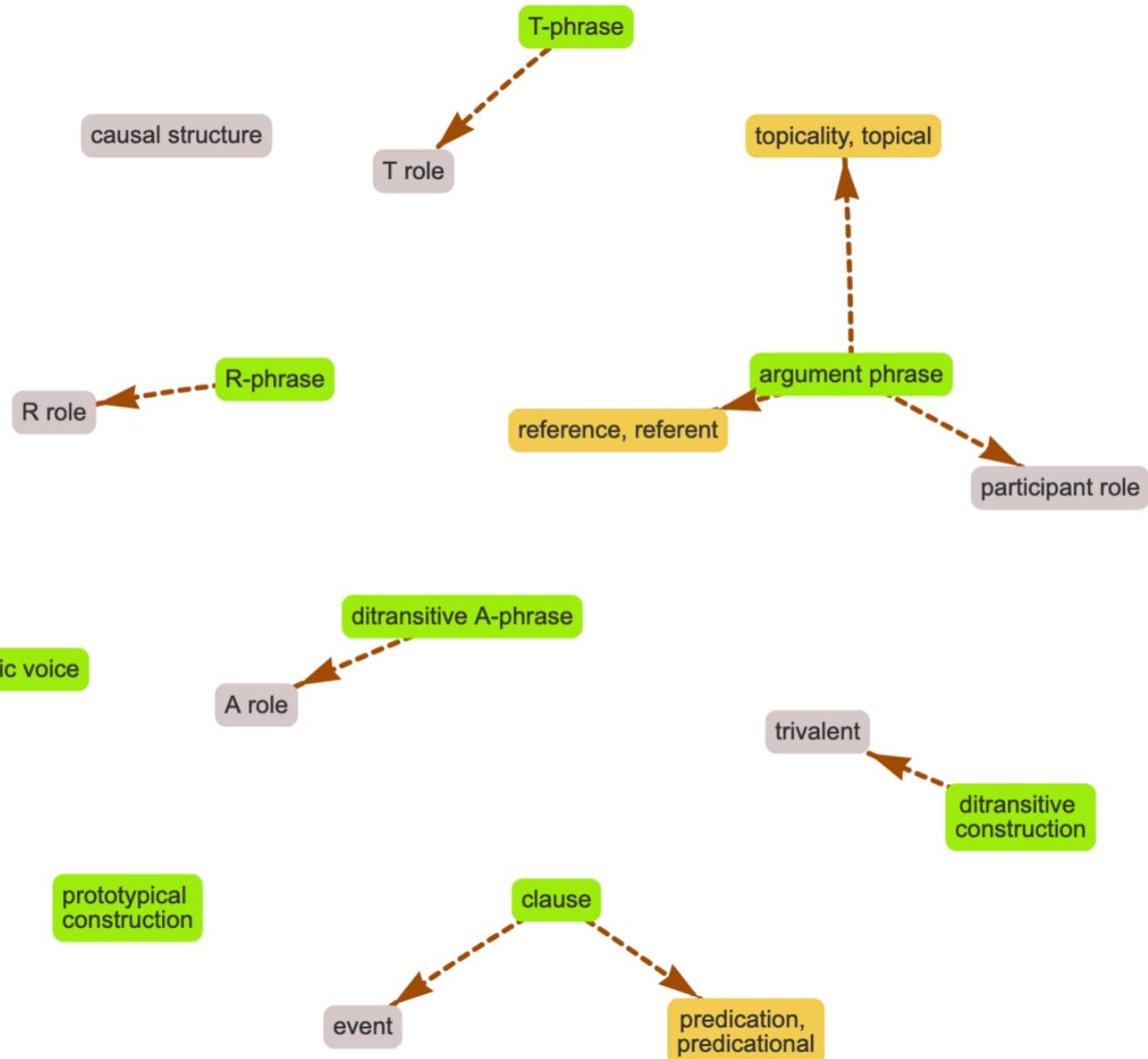
expand: upwards

downwards

outwards

search: ditransitive construction

Then selection: clear if necessary,
then grow: downwards (just once)



Finally to display all of the relations, toggle on SubtypeOf, ConstituentOf and HeadOf

Visualization of the Comparative Concepts database

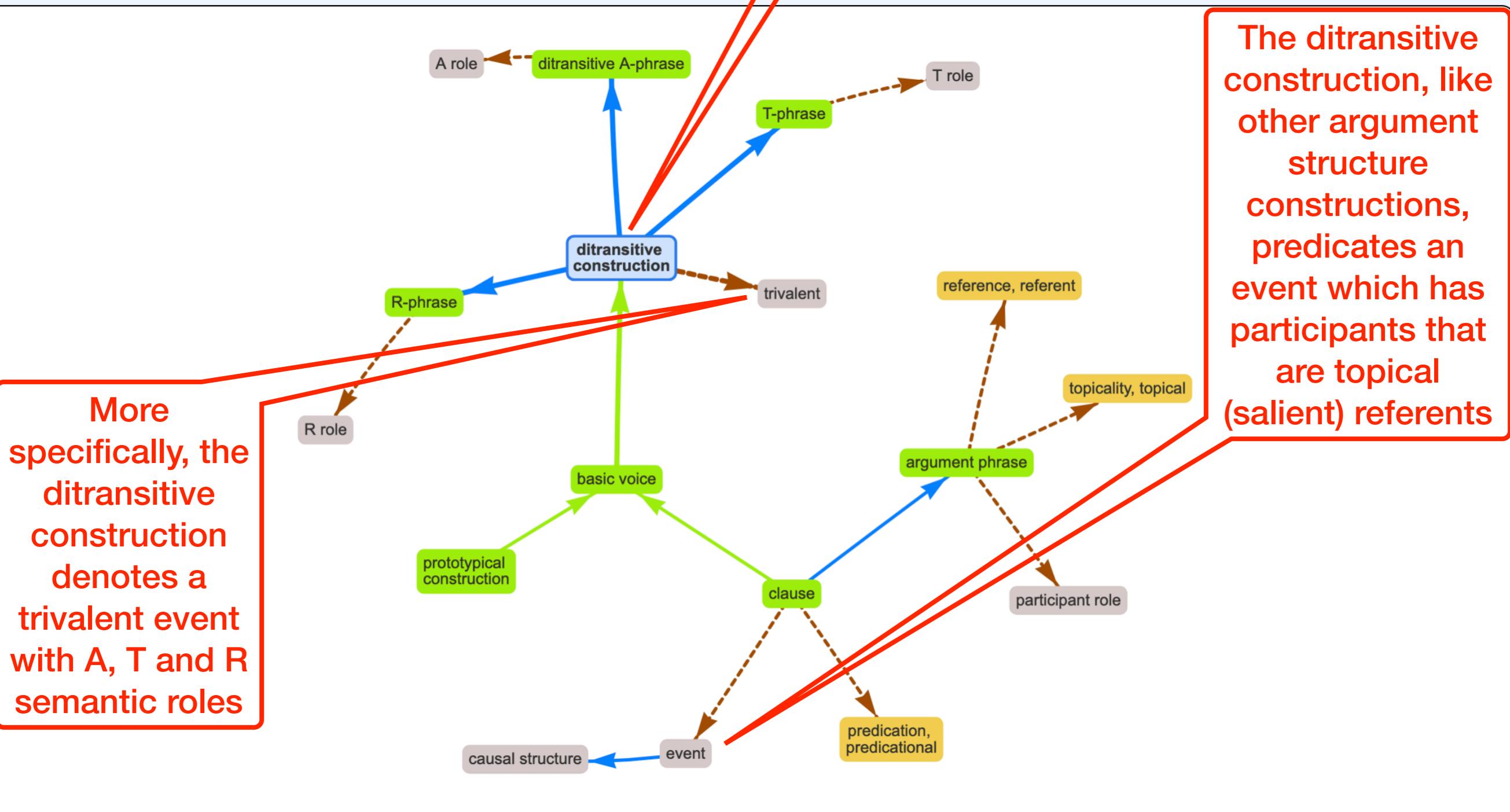
Instructions

Graph: Cxn ↔ Sem. + Inf. SubtypeOf ConstituentOf HeadOf FunctionOf

Show: Names Stabilize: Atlas2 Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: clear all visible unconnected expand: upwards downwards outwards search: ditransitive construction

You can select the node of the construction you're interested in for clarity



Taxonomies of events and semantic roles

Events and semantic roles

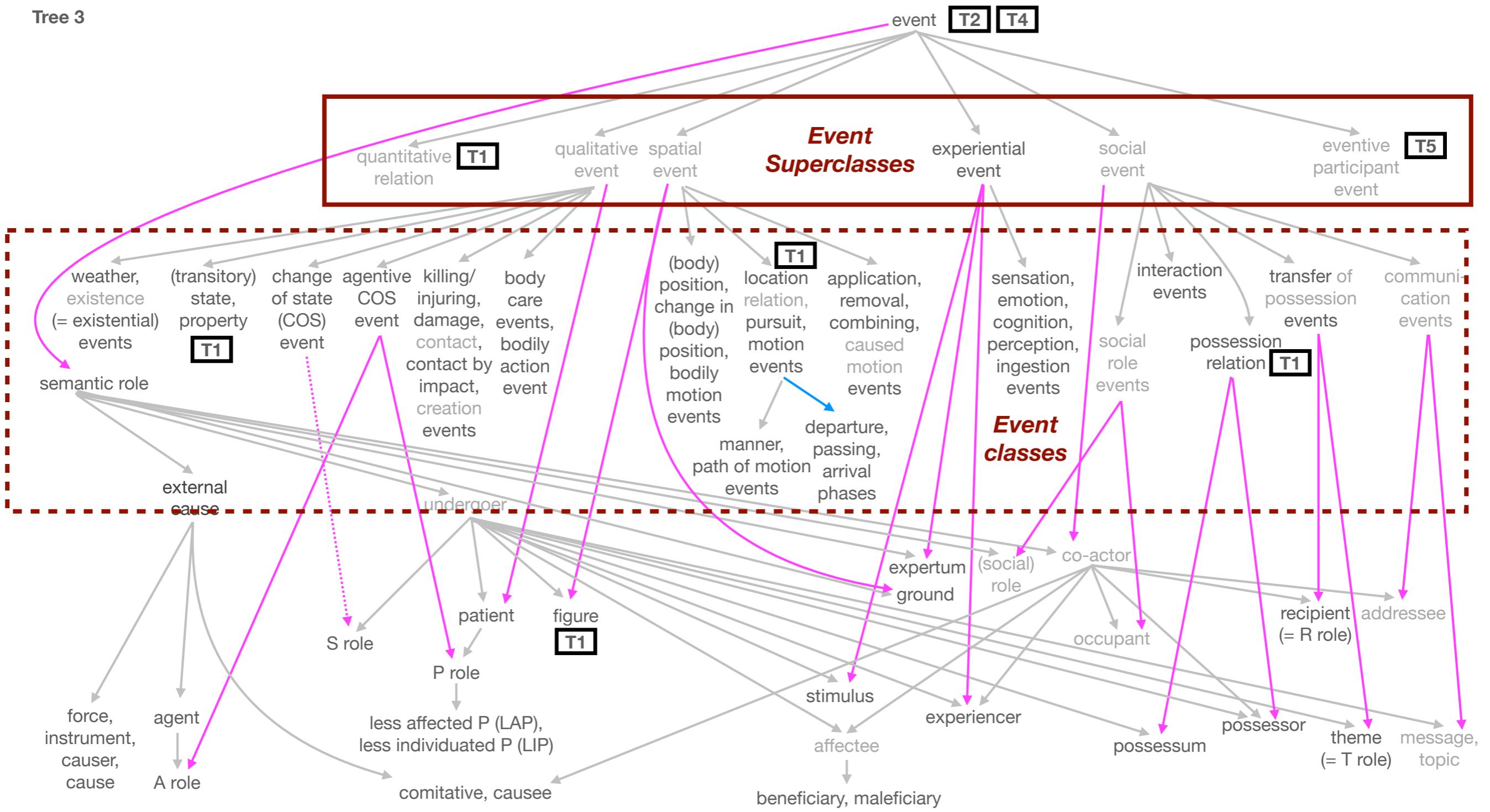
- There are many different ways to analyze events
- They can be classified by aspectual or causal (force-dynamic structure), by valency, and by semantic domain
- Events also have roles. These are also categorized in different ways
 - Semantic roles, defined across broad classes of events
 - Frame elements (FEs), defined by semantic frame
 - Participant roles (microroles), for each event

Events and roles in the CC database

- Aspectual structure and causal structure are parts of (=ConstituentOf) events
- Valency and attributes of aspectual structure and causal structure are attributes (=AttributeOf) events
- Semantic and participant roles are separate classifications of roles of (=RoleOf) events
- Frame Elements are represented in MoCCA FrameNet
- Semantic roles and events by semantic domain are organized hierarchically

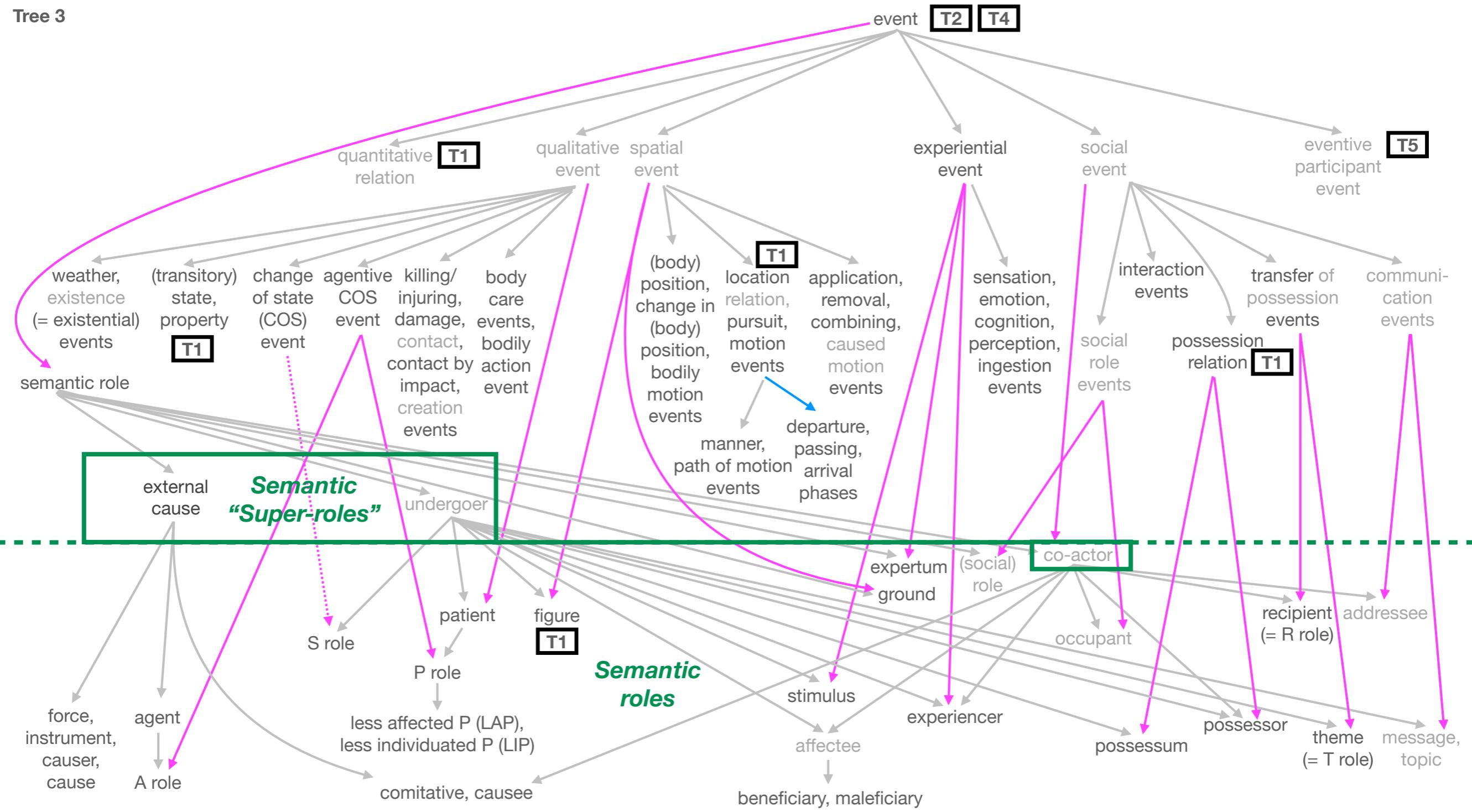
Construction Relations Tree 3

Tree 3



Construction Relations Tree 3

Tree 3



Taxonomy of events by
semantic domain

Event superclasses are straightforward to display; toggle on SubtypeOf, select event, and grow downwards

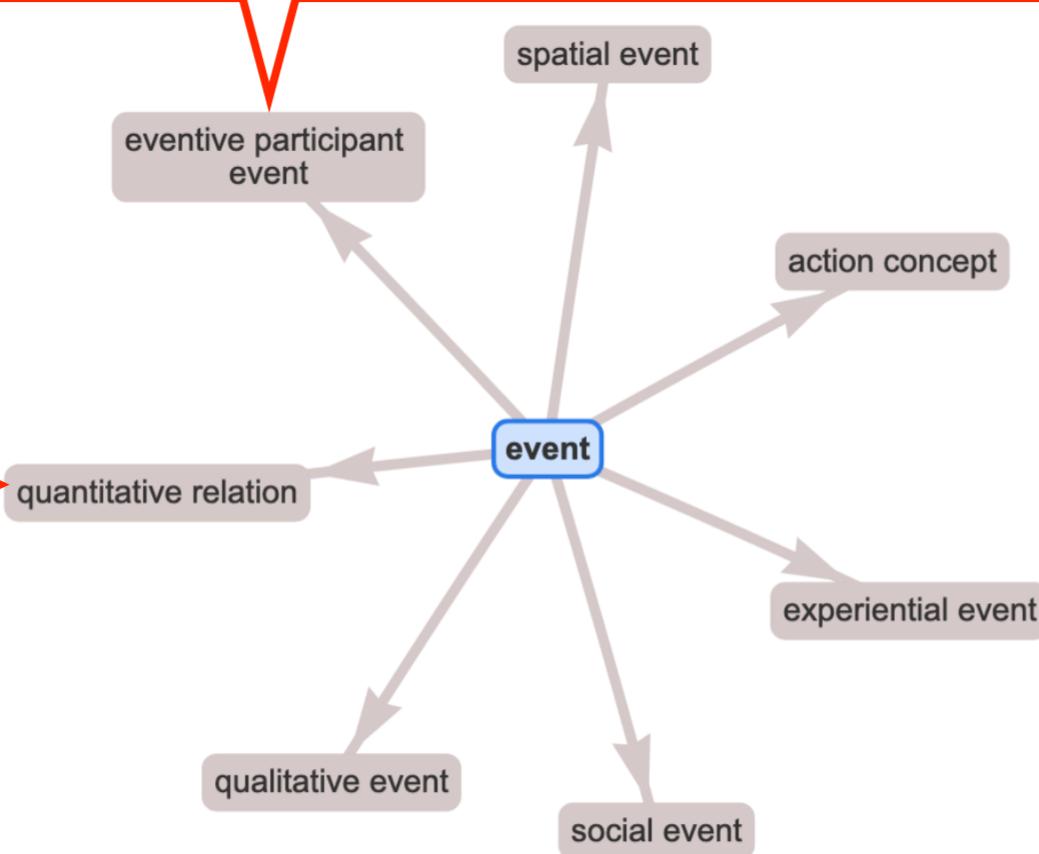
Visualization of the Comparative Concepts database

► Instructions

Graph: Semantic CCs SubtypeOf ConstituentOf AttributeOf RoleOf
Show: Names Stabilize: Atlas2 Subgraph: clear grow: upwards downwards outwards remove: unselected selected
Selection: clear all visible unconnected expand: upwards downwards outwards search: Type at least 3 characters

Superclass for events that have other events as participants
(usually expressed by complement clause constructions)

Superclass for events
that express
quantitative relations
(quantifiers,
numerals, measures,
etc.) that are rarely
predicated (usually
expressed as
modification
constructions)



Subtype in taxonomy
of basic ontological
categories (objects,
properties, actions).
We'll remove this
node when we're
done

Event classes are added by expand downwards, then grow downwards; “action concept” was selected and removed

Visualization of the Comparative Concepts database

► Instructions

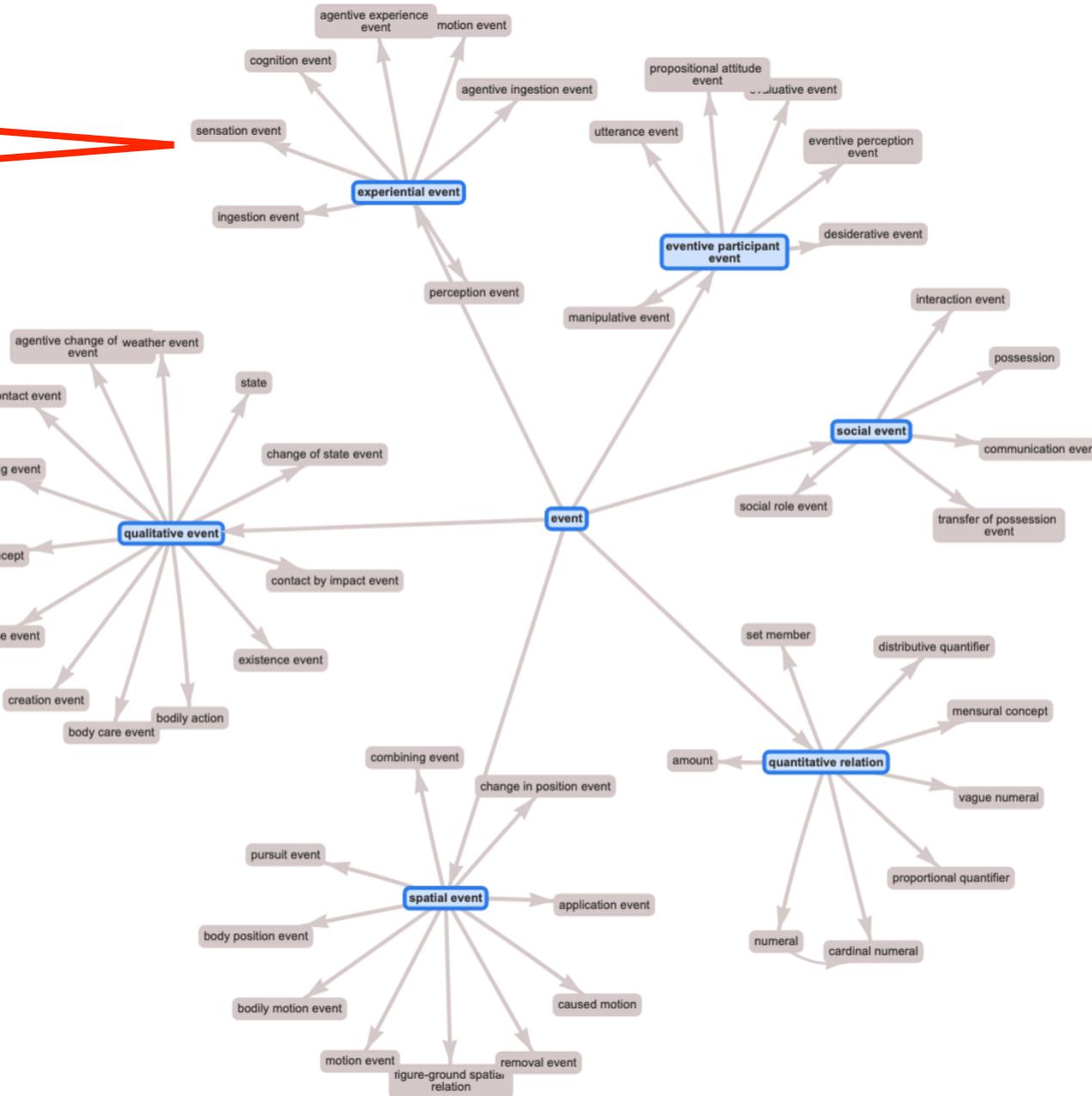
Graph: Semantic CCs SubtypeOf ConstituentOf AttributeOf RoleOf

Show: Names Stabilize: Atlas2 Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: clear all visible unconnected expand: upwards downwards outwards search: Type at least 3 characters

Hard to read here but can be enlarged to view the traditional event classes by semantic domain

Expand and grow downwards produces more subtypes, such as property concept classes



Taxonomy of semantic roles

Semantic “super-roles” are also straightforward to display; toggle on SubtypeOf, select semantic role, and grow downwards

Visualization of the Comparative Concepts database

► Instructions

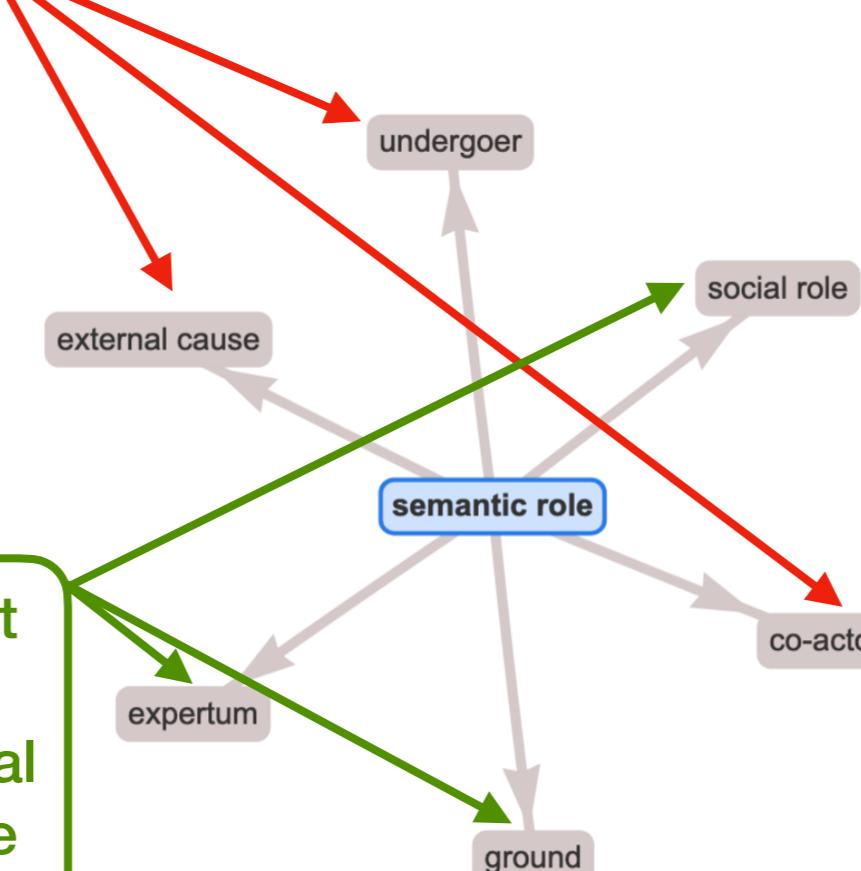
Graph: Semantic CCs SubtypeOf ConstituentOf AttributeOf RoleOf

Show: Names Stabilize: Atlas2 Subgraph: clear grow: upwards downwards outwards remove: unselected selected

Selection: clear all visible unconnected expand: upwards downwards outwards search: semantic role

Children of semantic role include the three “super-roles”: external cause, undergoer and co-actor (a general role for the second human participant in social events)

Three semantic roles don’t fit in the “super-roles”: ground is an inactive spatial participant, and social role and expertum are reifications of events (cf. *She is a violinist* vs. *She plays the violin*)



The traditional semantic roles are added by expand downwards, then grow downwards

Visualization of the Comparative Concepts database

► Instructions

Graph:

Semantic CCs

SubtypeOf

ConstituentOf

AttributeOf

RoleOf

Show:

Names

Stabilize:

Atlas2

Subgraph:

clear

grow: upwards

downwards

outwards

remove: unselected selected

Selection:

clear

all visible

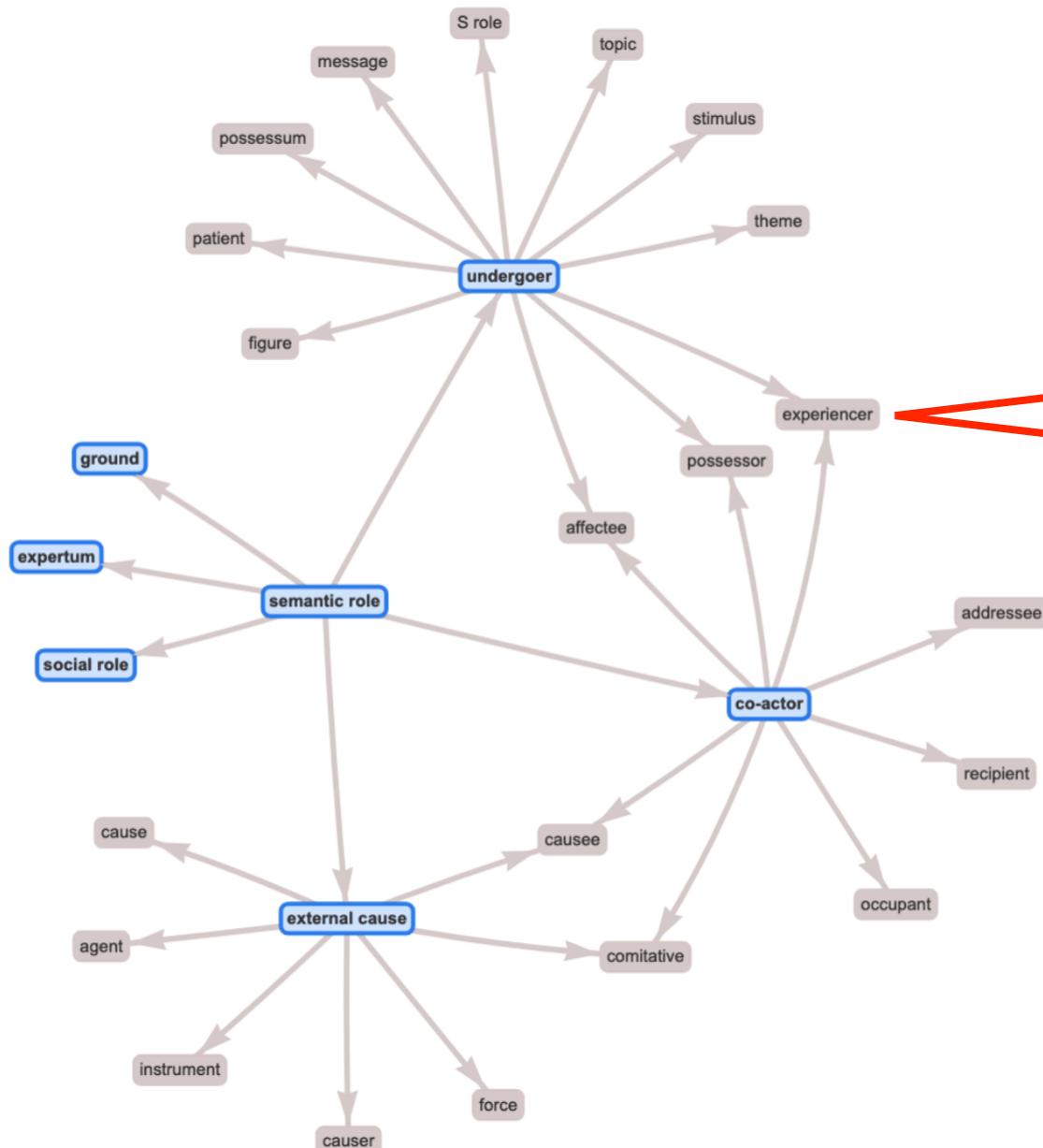
unconnected

expand: upwards

downwards

outwards

search: semantic role



Here the taxonomy is more of a lattice: some semantic roles are categorized under multiple “super-roles”, not unlike Dowty’s (1991) proto-roles

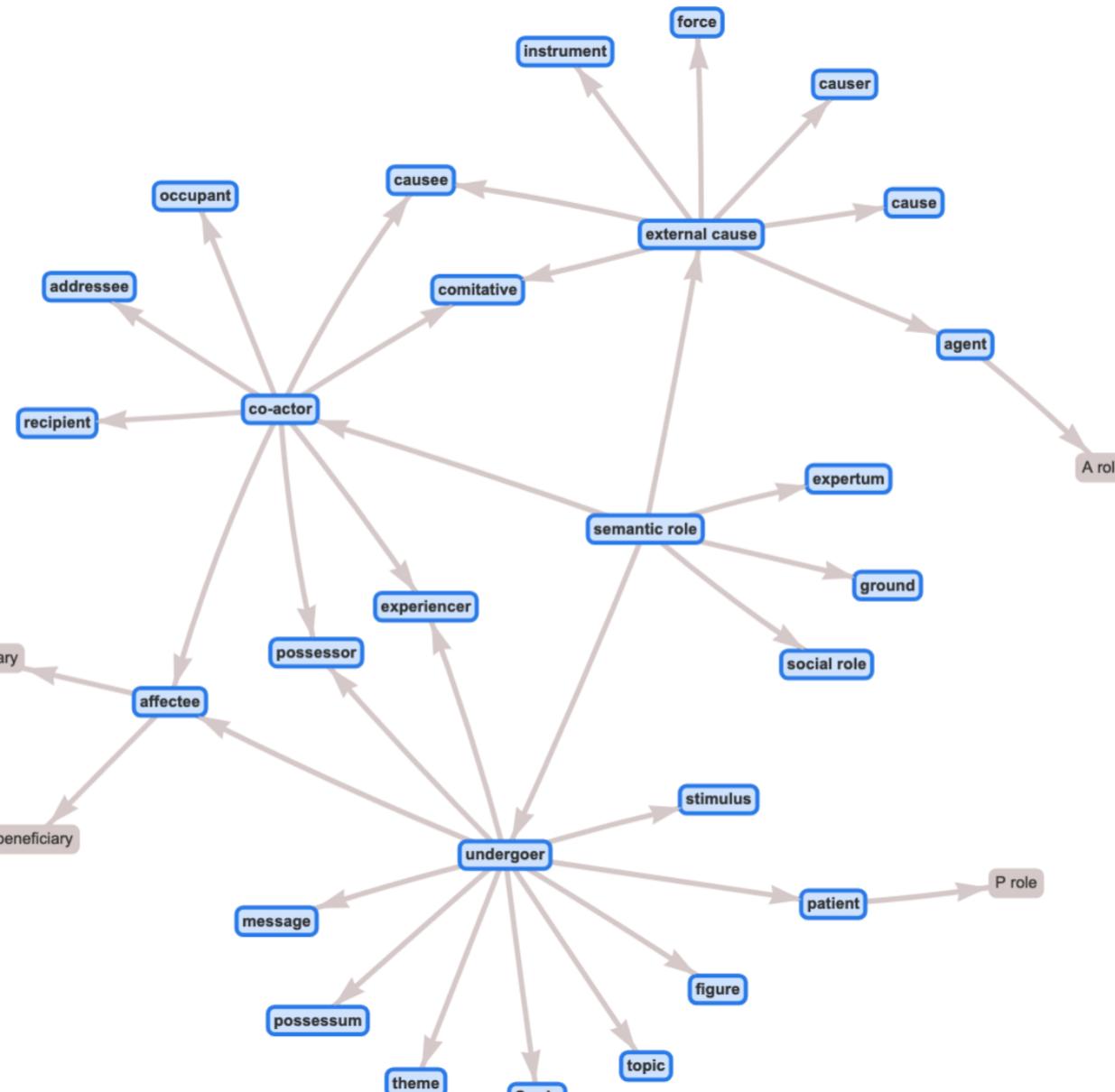
Visualization of the Comparative Concepts database

► Instructions

Graph: Semantic CCs SubtypeOf ConstituentOf AttributeOf RoleOf

Show: Names Stabilize: Atlas2 Subgraph: grow: remove:

Selection: expand: search: semantic role



Expand and
grow downwards
displays the
remaining
semantic roles

Summary

- These suggestions apply to Version 1.0 of the CC database (14 February 2025)
- High priority to add: definitions of CCs not in *Morphosyntax* (changes will be incorporated in a planned second edition); “Undo” button
- All feedback very welcome!! This is a resource for your use!