



UiT The Arctic University of Norway

Scaling up a construction: strategies for semantic classification and data management

Laura A. Janda

Overview

- Scaling up a construction and semantic classification
 - The Russian Construction
- Strategies for data management
 - FAIR Principles and TROLLing

Scaling up a construction and
semantic classification

The Russian Construction

Russian Constructicon co-authors



Anna
Endresen



Daria
Mordashova



Ekaterina
Rakhilina



Valentina
Zhukova

Russian Constructicon:

<https://constructicon.github.io/russian/>

- Endresen, Anna, Laura A. Janda, Daria Mordashova, Ekaterina Rakhilina, Valentina Zhukova. From data to theory: an emergent semantic classification based on a large-scale constructicon. Forthcoming in *Constructions and Frames*. 47pp.
- Endresen, Anna, Laura A. Janda, Daria Mordashova, Ekaterina Rakhilina, Valentina Zhukova. 2020. How to build a constructicon in five years: The Russian Example. In: Frank Brisard, Timothy Coleman, Astrid De Wit, Renata Enghels, Nikos Koutsoukos, Tanja Mortelmans, and María Sol Sansiñena (eds.), *The Wealth and Breadth of Construction-Based Research = Belgian Journal of Linguistics* 34: 161–173.
- Endresen, Anna, Laura A. Janda. 2020. Taking Construction Grammar One Step Further: Families, Clusters, and Networks of Evaluative Constructions in Russian. In: Mike Putnam, Matthew Carlson, Antonio Fábregas, Eva Wittenberg, eds. *Defining Construction: Insights into the Emergence and Generation of Linguistic Representations* (= special issue of *Frontiers in Psychology* 11). November 2020. 36pp.
<https://doi.org/10.3389/fpsyg.2020.574353>



RUSSIAN
CONSTRUCTICON

A multi-year, multi-national project



UiT The Arctic
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CLEAR

Cognitive Linguistics: Empirical Approaches to Russian



Direktoratet for
høyere utdanning
og kompetanse



HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY



МИНИСТЕРСТВО НАУКИ
И ВЫСШЕГО ОБРАЗОВАНИЯ
РОССИЙСКОЙ ФЕДЕРАЦИИ



한국연구재단
National Research Foundation of Korea

Overview: the Russian Constructicon

- Why and How We Built It
- Semantic Classification
- A Tour



RUSSIAN
CONSTRUCTICON

Overview: the Russian Constructicon

- Why and How We Built It
- Semantic Classification
- A Tour

Main Point:

We take seriously Fillmore's (2008) claim that a language is a structured inventory of constructions, a constructicon



Why and How We Built It

Why build a construction?

- For linguists
 - to achieve improved description of languages
 - to extend theory of construction grammar
 - to facilitate cross-linguistic typological comparison
- For L2 learners
 - to achieve greater language proficiency
 - to motivate use of specific wordforms
 - to fill in gaps in current language resources and pedagogy

For Linguists: Theoretical premises

CxG: numerous thorough studies of individual constructions found in various languages

Yet little is known about how the semantics of the entire system of constructions unfolds in a single language.

We need a relatively large inventory of constructions of a single language, and a detailed description of this inventory, a constructicon.

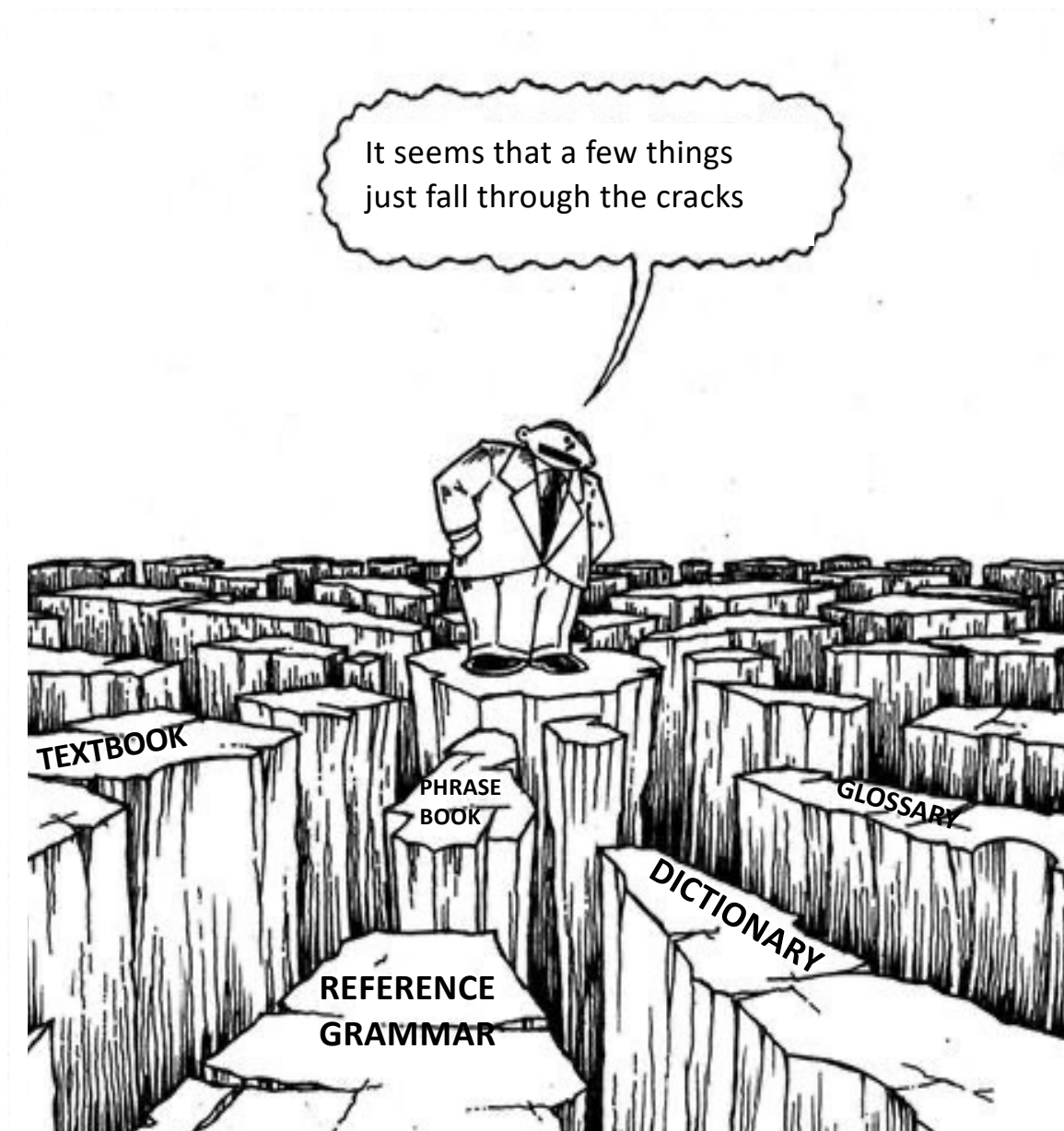
What are **the major types of meanings** that multi-word grammatical constructions can encode?

What semantic types of constructions are **attested more often** than others?

Do various types of constructional meaning form a coherent **system**?

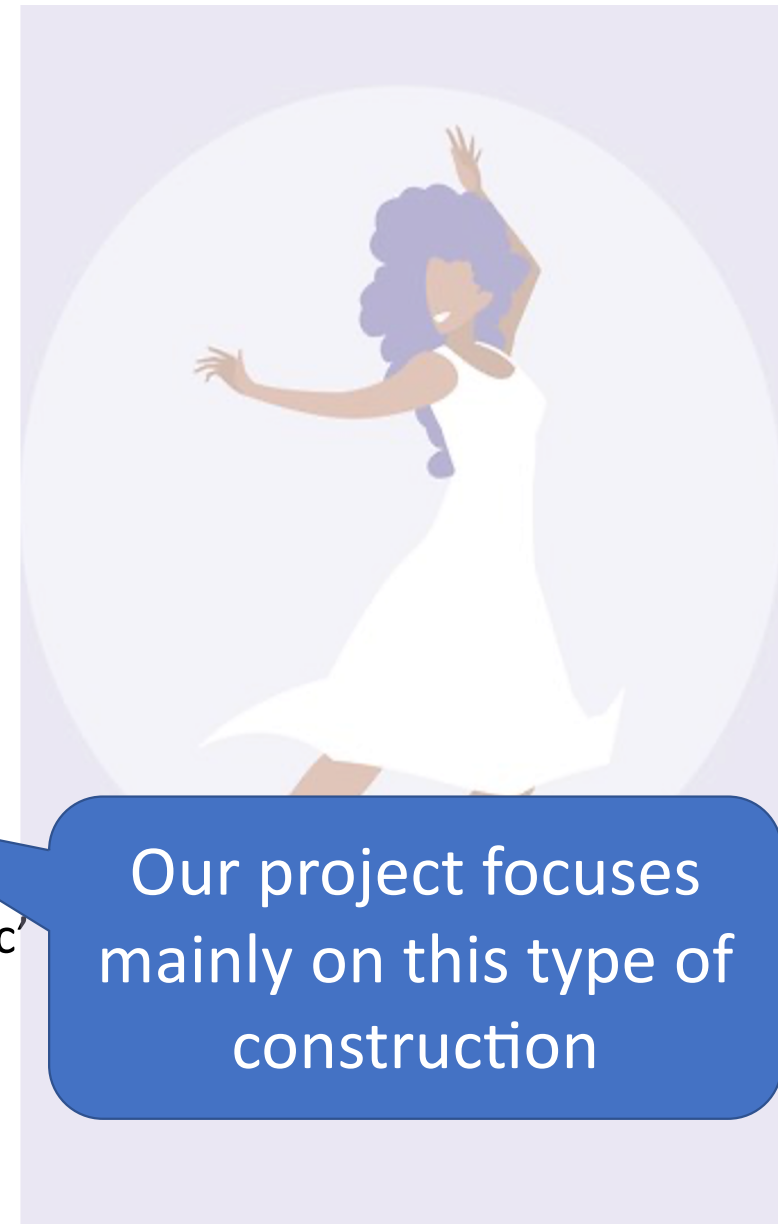
For Learners: Filling in the gaps

- Dictionaries, grammars, and textbooks focus primarily on lexemes, lexicalized idioms, inflectional paradigms, and grammatical patterns
- **Multi-word expressions with open slots** are less reliably represented in standard resources



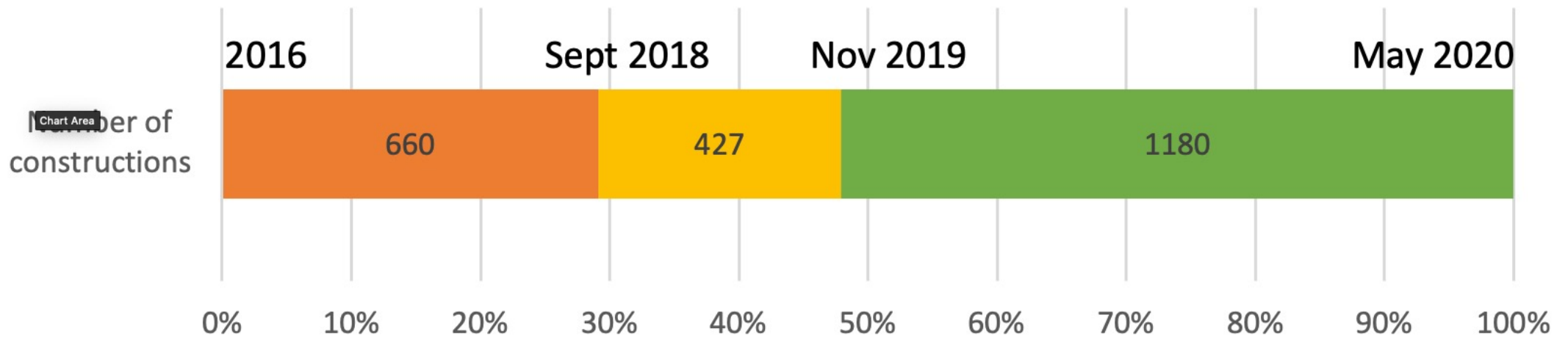
Examples of Russian constructions

- morphemes
-t' = INF
- lexemes
tancevat' 'dance'
- multi-word idioms where all slots are fixed
tancevat' ot Adama 'start from the very beginning'
- **multi-word expressions with open slots**
VP pod NP-Acc
Ona tancevala pod muzyku 'She danced to the music'
- larger discourse units



Our project focuses mainly on this type of construction

Scaling up our construction



Initial inventory

Manual collection from textbooks, scholarly literature, crowdsourcing

Corpus-based expansion

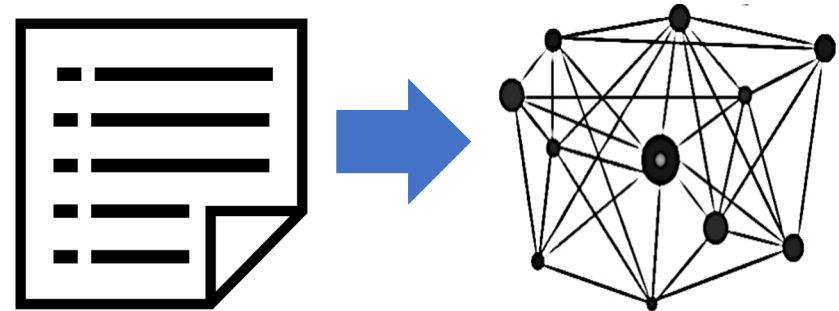
Extraction from dialogs, spoken discourse, and RNC collocations
Classification of syntactic & semantic types

System-based expansion

Searches for synonyms, antonyms and anchor words based on semantic classification

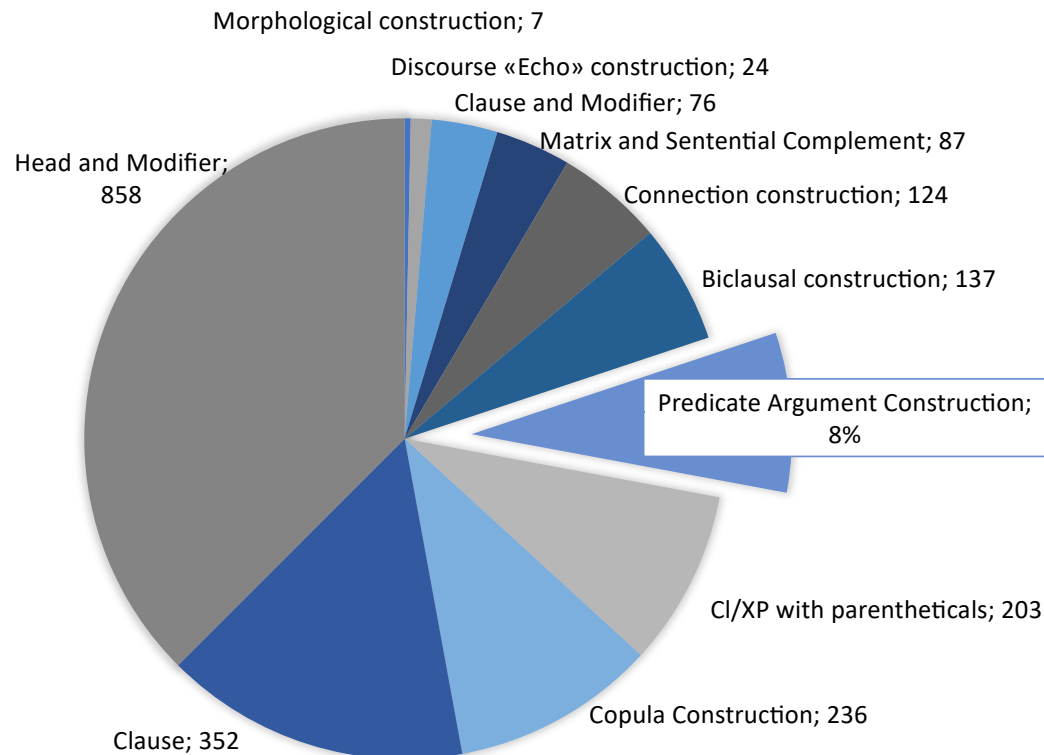
Practical considerations

- How exactly to turn a list of collected items into a structured inventory?
- This is a practical challenge that all existing constructions face.



- Other constructions are closely connected to a FrameNet resource and focus on verb argument constructions.
- FrameNet has been suggested as an alternative (Fillmore and Atkins 1992; Fillmore et al. 2012).
- In other constructions, constructions are classified semantically according frames they evoke (Ohara 2014, 2018; Boas et al. 2016; Torrent et al. 2014, Lee-Goldman & Petruck 2018).

Why frame semantics is not enough



- Frame semantics focuses on Predicate Argument constructions, which constitute only 8% (184 items) of our database
- Our Constructicon includes a larger variety of conventionalized form-meaning pairings that can be understood as an early stage in the process of grammaticalization, in which quasigrammatical meanings are distributed across constructions and their (partially bleached) anchor words
- Classification rests on various classifications of Universal grammatical inventory discussed in a wide range of typological studies (cf. Bybee et al 1994, Melchuk 1993-2000).

Bottom up approach

- Our aim
 - to analyze constructions on their own terms, allowing patterns to emerge from the data, not imposing other models
- Methodology
 - We annotated individual constructions by assigning semantic tags that capture relevant aspects of their meaning
 - The annotation of constructions was carried out by a panel of three native speakers
 - The taggers worked together as a team over a long period of time
 - Reaching a consensus about annotation of each construction

A blue ribbon graphic with a folded end on the left side, containing the text "Semantic Classification".

Semantic Classification

Semantic types of constructions grouped into classes and subclasses

1. Qualia			
1.1. Situation structure	1.2. Major roles	1.4. Logical relations	1.6. Sets and elements
<ul style="list-style-type: none"> • Timeline + • Taxis + • Actionality + • Pluractionality + • Phase of action + • Result + • Actuality 	<ul style="list-style-type: none"> • Addressee + • Instrument • Possession • Comitative • Caritive • Non-standard subject + 	<ul style="list-style-type: none"> • Cause • Purpose • Consequence • Condition • Concession + 	<ul style="list-style-type: none"> • Additive • Inclusive • Exceptive • Exclusive • Subset • Options • Quantification +
1.3. Situation modifiers		1.5. Properties	1.7. Magnitude
<ul style="list-style-type: none"> • Spatial expressions + • Temporal expressions + • Manner 		<ul style="list-style-type: none"> • Salient property + • Temporary characteristics + • Comparison + 	<ul style="list-style-type: none"> • Non-existence + • Measure + • Calculation +
2. Modality and its neighborhood		3. Subjectivity	4. Discourse
2.1. Core modal meanings	<ul style="list-style-type: none"> • Assessment + • Attitude + • Polarity value + • Source of opinion + • Mirative 	4.1. Discourse organization	<ul style="list-style-type: none"> • Degree of intensity + • Degree of accuracy +
<ul style="list-style-type: none"> • Root modality + • Epistemic modality + 		<ul style="list-style-type: none"> • Discourse structure + • Intersubjectivity • Objectivity • Source of information 	
2.2. Neighborhood		4.2. Discourse clauses	
<ul style="list-style-type: none"> • Volition • Causation + • Prohibition + • Threat • Request • Apprehension + • Curse 		<ul style="list-style-type: none"> • Reaction to the previous discourse + • Routine + 	

A visualization of 55 semantic types of constructions grouped into subclasses and classes

182 semantic subtypes of constructions

1. Semantic class Qualia

— constructions that describe the properties of the given objective physical world, external to the speaker

1. Qualia			
1.1. Situation structure	1.2. Major roles	1.4. Logical relations	1.6. Sets and elements
<ul style="list-style-type: none"> • Timeline + • Taxis + • Actionality + • Pluractionality + • Phase of action + • Result + • Actuality 	<ul style="list-style-type: none"> • Addressee + • Instrument • Possession • Comitative • Caritive • Non-standard subject + 	<ul style="list-style-type: none"> • Cause • Purpose • Consequence • Condition • Concession + 	<ul style="list-style-type: none"> • Additive • Inclusive • Exceptive • Exclusive • Subset • Options • Quantification +
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2. Semantic class Modality and its neighborhood

1. Qualia			
1.1. Situation structure	1.2. Major roles	1.4. Logical relations	1.6. Sets and elements
<ul style="list-style-type: none"> • Timeline + • Taxis + • Actionality + • Pluractionality + • Phase of action + • Result + • Actuality 	<ul style="list-style-type: none"> • Addressee + • Instrument • Possession • Comitative • Caritive • Non-standard subject + 	<ul style="list-style-type: none"> • Cause • Purpose • Consequence • Condition • Concession + 	<ul style="list-style-type: none"> • Additive • Inclusive • Exceptive • Exclusive • Subset • Options • Quantification +
1.3. Situation modifiers		1.5. Properties	1.7. Magnitude
<ul style="list-style-type: none"> • Spatial expressions + • Temporal expressions + • Manner 		<ul style="list-style-type: none"> • Salient property + • Temporary characteristics + • Comparison + 	<ul style="list-style-type: none"> • Non-existence + • Measure + • Calculation +
2. Modality and its neighborhood			
2.1. Core modal meanings	3. Subjectivity	4. Discourse	5. Parameters
<ul style="list-style-type: none"> • Root modality + • Epistemic modality + 		4.1. Discourse organization	
2.2. Neighborhood		<ul style="list-style-type: none"> • Discourse structure + • Intersubjectivity • Objectivity • Source of information 	
<ul style="list-style-type: none"> • Volition • Causation + • Prohibition + • Threat • Request • Apprehension + • Curse 	<ul style="list-style-type: none"> • Assessment + • Attitude + • Polarity value + • Source of opinion + • Mirative 	4.2. Discourse clauses	<ul style="list-style-type: none"> • Degree of intensity + • Degree of accuracy +
		<ul style="list-style-type: none"> • Reaction to the previous discourse + • Routine + 	

3. Semantic class Subjectivity

1. Qualia			
1.1. Situation structure	1.2. Major roles	1.4. Logical relations	1.6. Sets and elements
<ul style="list-style-type: none"> • Timeline + • Taxis + • Actionality + • Pluractionality + • Phase of action + • Result + • Actuality 	<ul style="list-style-type: none"> • Addressee + • Instrument • Possession • Comitative • Caritive • Non-standard subject + 	<ul style="list-style-type: none"> • Cause • Purpose • Consequence • Condition • Concession + 	<ul style="list-style-type: none"> • Additive • Inclusive • Exceptive • Exclusive • Subset • Options • Quantification +
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2.2. Neighborhood		4.2. Discourse clauses	
<ul style="list-style-type: none"> • Volition • Causation + • Prohibition + • Threat • Request • Apprehension + • Curse 		<ul style="list-style-type: none"> • Reaction to the previous discourse + • Routine + 	

— constructions that encode the subjective evaluation of a situation, its elements or participants by the speaker.

4. Semantic class Discourse

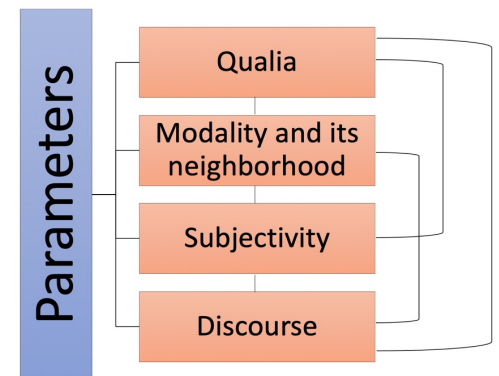
- constructions that function at the discourse level:
- structure the text
 - organize the communication
 - refer to a broader context than a single sentence

1. Qualia			
1.1. Situation structure	1.2. Major roles	1.4. Logical relations	1.6. Sets and elements
<ul style="list-style-type: none"> • Timeline + • Taxis + • Actionality + • Pluractionality + • Phase of action + • Result + • Actuality 	<ul style="list-style-type: none"> • Addressee + • Instrument • Possession • Comitative • Caritive • Non-standard subject + 	<ul style="list-style-type: none"> • Cause • Purpose • Consequence • Condition • Concession + 	<ul style="list-style-type: none"> • Additive • Inclusive • Exceptive • Exclusive • Subset • Options • Quantification +
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<ul style="list-style-type: none"> • Root modality + • Epistemic modality + 		4.1. Discourse organization	
2.2. Neighborhood		<ul style="list-style-type: none"> • Discourse structure + • Intersubjectivity • Objectivity • Source of information 	
<ul style="list-style-type: none"> • Volition • Causation + • Prohibition + • Threat • Request • Apprehension + • Curse 		4.2. Discourse clauses	
		<ul style="list-style-type: none"> • Reaction to the previous discourse + • Routine + 	
		5. Parameters	
		<ul style="list-style-type: none"> • Degree of intensity + • Degree of accuracy + 	

5. Semantic class Parameters

1. Qualia				
1.1. Situation structure	1.2. Major roles	1.4. Logical relations	1.6. Sets and elements	
<ul style="list-style-type: none"> • Timeline + • Taxis + • Actionality + • Pluractionality + • Phase of action + • Result + • Actuality 	<ul style="list-style-type: none"> • Addressee + • Instrument • Possession • Comitative • Caritive • Non-standard subject + 	<ul style="list-style-type: none"> • Cause • Purpose • Consequence • Condition • Concession + 	<ul style="list-style-type: none"> • Additive • Inclusive • Exceptive • Exclusive • Subset • Options • Quantification + 	
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<ul style="list-style-type: none"> • Spatial expressions + • Temporal expressions + • Manner 	<ul style="list-style-type: none"> • Salient property + • Temporary characteristics + • Comparison + 	<ul style="list-style-type: none"> • Non-existence + • Measure + • Calculation + 		
2. Modality and its neighborhood		3. Subjectivity	4. Discourse	
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2.2. Neighborhood		4.2. Discourse clauses		
<ul style="list-style-type: none"> • Volition • Causation + • Prohibition + • Threat • Request • Apprehension + • Curse 	<ul style="list-style-type: none"> • Reaction to the previous discourse + • Routine + 			

- imply a scale that serves as a point of reference for a property or a situation characterized by a construction
- can apply to and "build over" other meanings



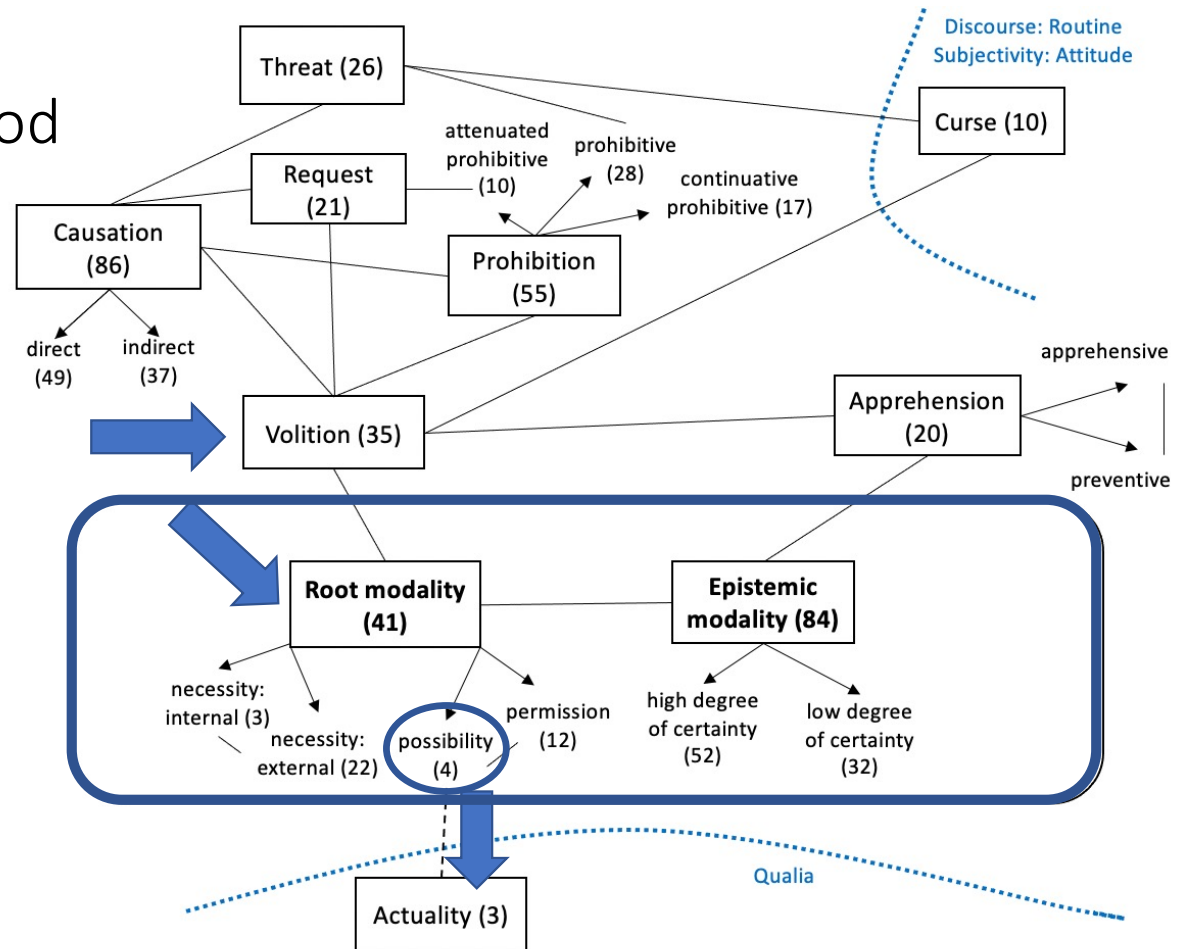
Classification of constructions

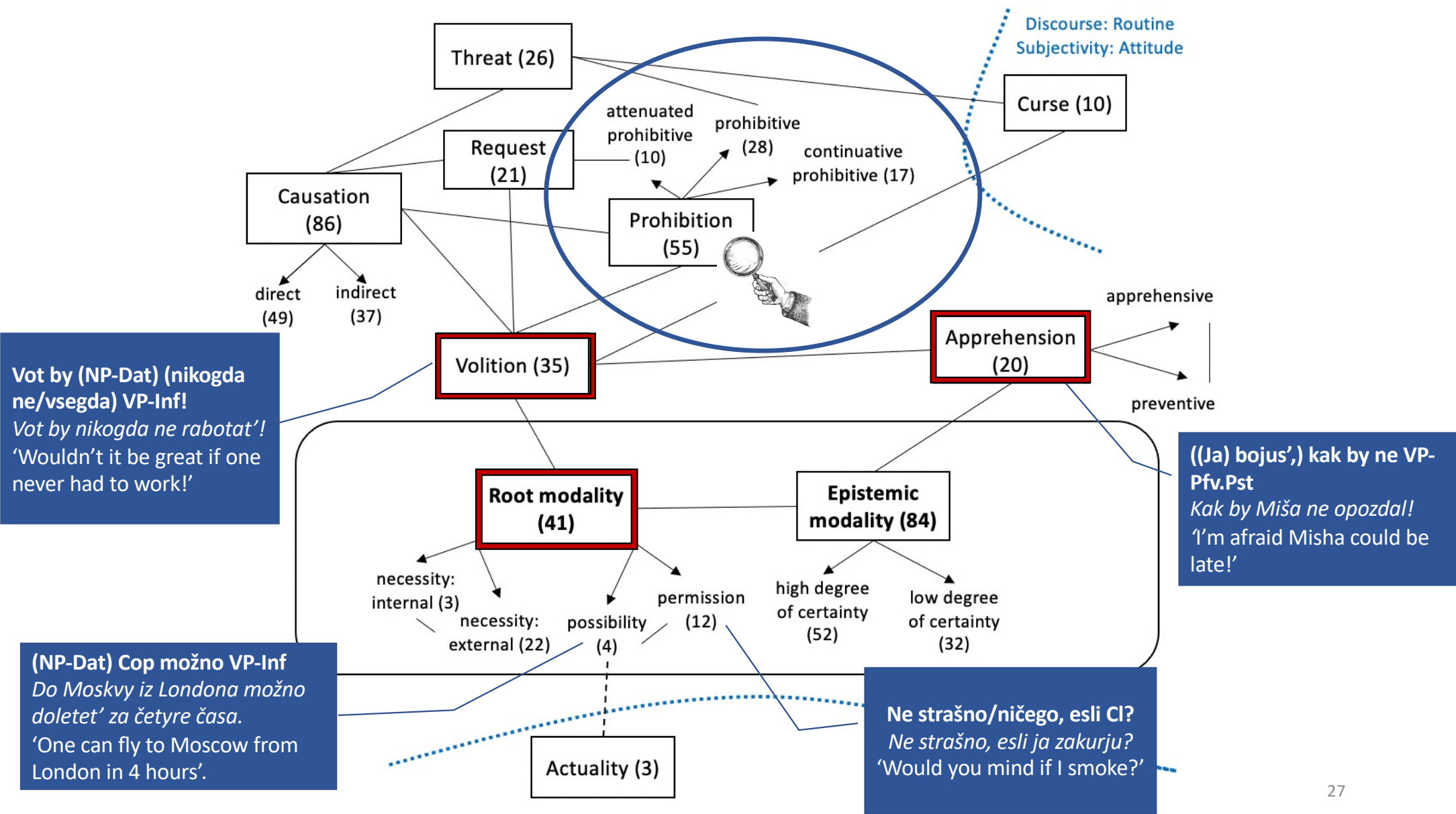
- Families
 - a family is a relatively homogeneous group of approx. 2-9 constructions that share some semantic, syntactic, and/or structural properties
 - the constructions in a family share various subsets of these properties
 - semantic and syntactic tags facilitate identification of families
 - annotation by a panel of three native speakers
- Clusters
 - a cluster is a group of families that are linked through semantic and/or syntactic similarities in a prototypical vs. peripheral distribution, usually corresponding to semantic subtypes in annotation
- Networks
 - a network is a group of clusters that share a general semantic tag

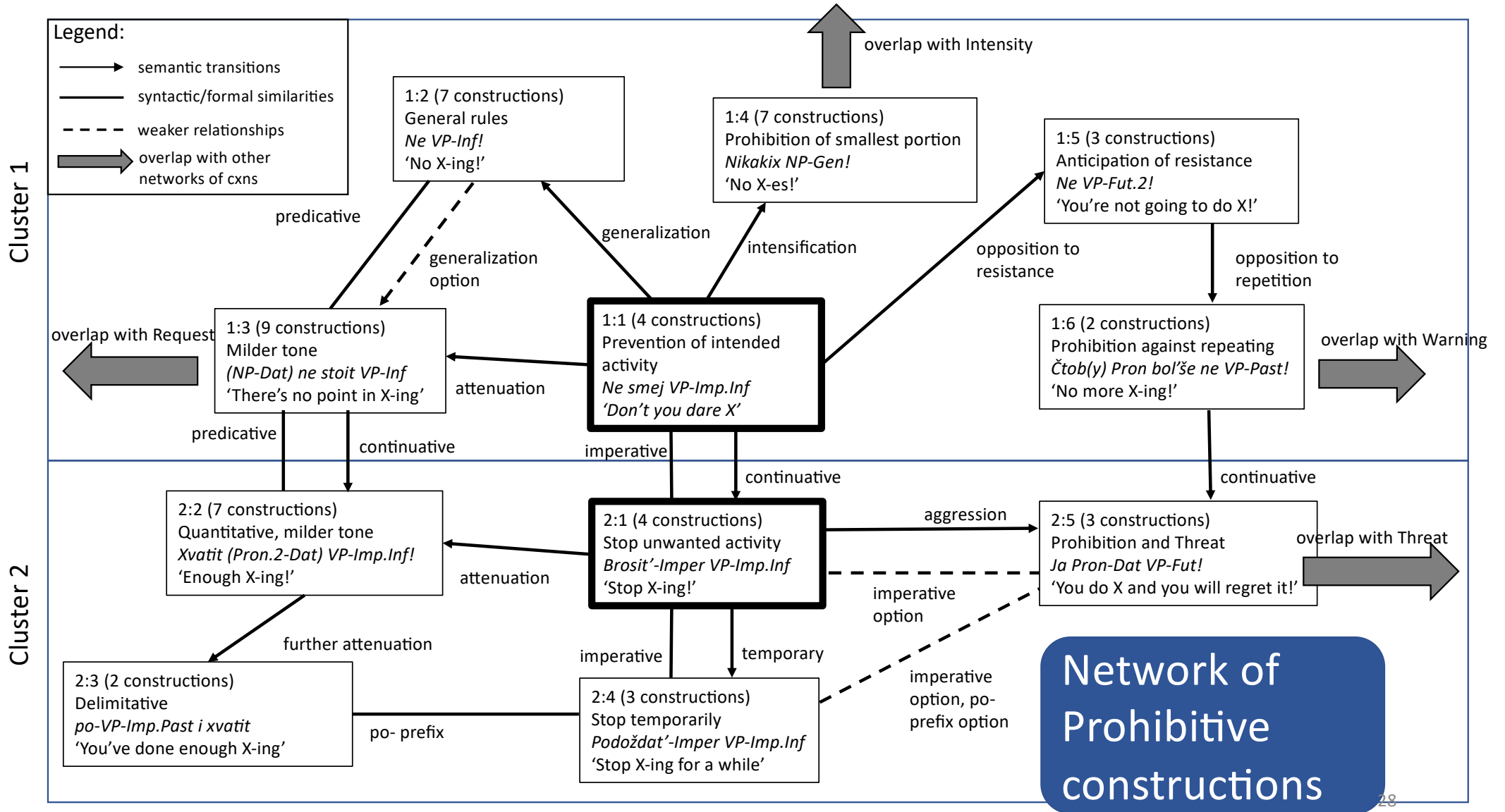
NEXT: Modality and its neighborhood, zooming in on two clusters of Prohibitive constructions

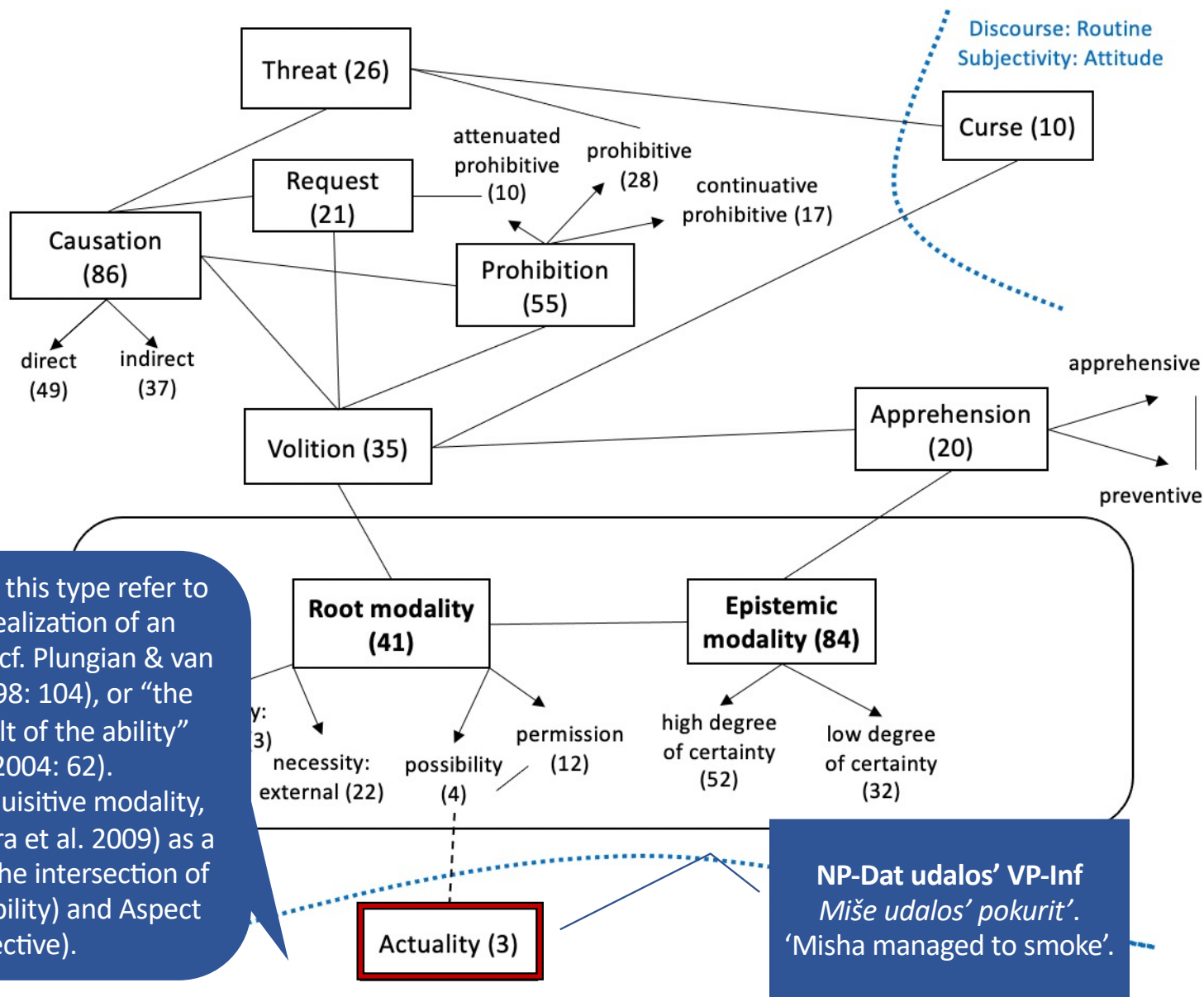
Class of constructions: Modality and its neighborhood

- 301 constructions
- Can be modelled as a radial category – central "core" modal meanings and their neighborhood
- Includes 10 semantic types (visualized as boxes)
- Arrows indicate subtypes of semantic types
- Numbers in () – type frequency of each type in terms of individual constructions
- Solid lines – connections between types within this class
- Dashed lines – overlaps with other classes (indicated by dotted blue lines)









A blue ribbon graphic with a 3D effect, featuring a white shadow on the left side. The text "A Tour" is written in white, sans-serif font on the left side of the ribbon.

A Tour



<https://construction.github.io/russian/>

The Russian Constructicon

- Over 2200 constructions
- Arguably the largest openly available constructicon resource for any language
- User-friendly for linguists, teachers, learners
- Searchable according to semantics, anchor words, syntax
- Open-source, publicly archived data
- Designed to be portable to other languages, reproducible



RUSSIAN
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youtube.com/channel/UC8q-_F8c8bx9gl7fYET1-dQ

YouTube NO Search

a searchable database of multiword grammatical constructions of Russian

RUSSIAN CONSTRUCTICON

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Thumbnail	Category	Title	Duration	Views	Time Ago
	Get to Know	Русский конструктикон	20:27	23 views	2 months ago
	Conference talk	How to build a construction in 5 years?	18:34	17 views	2 months ago
	Get to Know	SMARTool	4:56	12 views	2 months ago
	Conference talk	Русский конструктикон 2020	16:40	9 views	2 months ago

Meet the team 1

Meet the team 1

Get to Know 1

Get to Know 2

Conference talk 7

Strategies for data management

FAIR Principles and TROLLing

Data management and FAIR principles

- Janda, Laura A. 2022. Managing data and statistical code according to the FAIR principles. In: Andrea Berez-Kroeker, Brad McDonnell, & Eve Koller (eds.), *MIT Open Handbook of Linguistic Data Management*. *Open Handbooks in Linguistics*, Vol 1. Chapter 37, pp. 447–452. 2022. <https://doi.org/10.7551/mitpress/12200.003.0042>

Murphy's law and data management

- All of these things have happened to me
 - I lost the data
 - The data got corrupted/uninterpretable
 - Site-licenses for proprietary software did not get renewed
 - The software underwent a backward-incompatible upgrade
 - The meanings of all the abbreviations and code that were so obvious when working on the original project evaporated from my personal memory



In other words, I got permanently separated from my data and analysis...

FAIR principles for data management (Wilkinson et al. 2016)

- **Findable**: Metadata makes it possible for other researchers to find the data and code
- **Accessible**: A publicly available archive makes it possible for other researchers to access the data and code
- **Interoperable**: Persistent open-source file formats make it possible for other researchers to open and use the files
- **Reusable**: Adequate description of the files, their contents, the variables, and their values, as well as annotation for the statistical code, will make it possible for other researchers to understand and reuse the data and code

Findable: Harvestable metadata

- Metadata should be built into the archive where your data is stored (see **Accessible**)
- Metadata should be searchable
- Examples of types of metadata:
 - Keywords: “North Saami, possessive suffix, Uralic, S-curve, vocative, possession, language change, complexity”
 - Topic Classifications: “morphology, diachronic, affixes”
 - Kind of Data: “corpus, questionnaire, experiment”
 - Geographic Coverage: “Norway, Sweden, Finland, Sápmi, Northern Scandinavia”



Accessible: Publicly available archive

- Data and code should be stored in an archive that is publicly accessible, and preferably both free and searchable without a password
- Each set of data and code can be assigned a post and metadata can be attached
- Each post should be supplied with a unique identifier and URL (e.g., DOI – digital object identifier)
- Mutual co-referencing: If there is a published article, the DOI can be published in the article and the article can be cited in the post
- The archive should be professionally curated and maintained

Interoperable: Persistent open-source formats

- The use of appropriate formats makes data and code usable across platforms
- Data and code should be presented in formats that can be accessed by anyone and at any future time
- Examples of persistent non-proprietary open formats: .pdf and .txt
- Using such formats can mean losing the direct connection to software that comes along with an item such as an R script. This can be handled by providing duplicate files in different formats.

Reusable: Description and annotation

- README files that fully explain all variables and their values
- Assign file names that will organize the files in a logical order when downloaded and are descriptive:
 - 01README.txt
 - 02data.csv
 - 03data.pdf
 - 04code_for_regression_analysis.Rmd
 - 05code_for_regression_analysis.pdf
- Annotate every line of code (e.g., with # or in names of R chunks)



Adhering to FAIR principles means extra work for us, so why do it?

- For the good of the field
- For yourself

Tip: if you have the FAIR principles in mind from the start, and are consistent in documenting and annotating as you go along, it will not be so much of a burden in the end



FAIR for the good of the field

- Set ethical standards for best practices in data management and promote collaboration
- Improve the overall level of accountability and integrity in the field
- Safeguard against research fraud
- Foster horizontal learning across the community of researchers, facilitating the propagation of new methods
- Eliminate unnecessary duplication of efforts and representation of negative results
- Provide data for previously unforeseen uses

FAIR for yourself

- Will you remember what the factors and their values are, what all the abbreviations stand for, and how each line of code works:
 - in a month, in a year, in 5 years?
- You never know when you might need to go back to a data set, either to squeeze another analysis out of it or to use it as a recipe for a parallel analysis of new data
- Or when someone else might want to do an additional analysis of your data or similar data and might come with questions

A PLACE FOR US:



<https://dataverse.no/dataverse/trolling>



TROLLing

- is an international archive of linguistic data and statistical code
- is built on the Dataverse platform from Harvard University and complies with DataCite, the international standard for storing and citing research data
- is compliant with CLARIN, the EU research infrastructure for language-based resources
- assigns a permanent URL to each post
- uses metadata that ensures visibility and retrieval through international services
- is professionally managed by the University Library of Tromsø and an international steering committee



DataverseNO > TROLLing

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Getting started with TROLLing



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Publication Year

2014 (21)

2020 (19)

2016 (17)

2021 (14)

2017 (12)

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Replication Data for: Eye Behavior during Syntactic Movement Evidence for Processing Approach to Persian Syntax

Jun 28, 2021

Alaee, Majid; Rasekh-Mahand, Mohammad; Tehrani-Doost, Mahdi, 2021, "Replication Data for: Eye Behavior during Syntactic Movement Evidence for Processing Approach to Persian Syntax", <https://doi.org/10.18710/TZBAOR>, DataverseNO, V1

[Dataset abstract:] The datasets include experimental material on an eye-tracking analysis in Persian syntax and how syntactic movement in this language is affected by weight factor. It also includes statistical datasets and the results of statistical analysis. In addition, some...

Replication Data for: Davvisámi earutkeahthes oamasteapmi

Jun 24, 2021

Janda, Laura A; Antonsen, Lene, 2020, "Replication Data for: Davvisámi earutkeahthes oamasteapmi", <https://doi.org/10.18710/QGXLOR>, DataverseNO, V2, UNE:6:TEN1nDnmWcpB9xsXi.lgcZq==.fileUNE

Getting started with TROLLing

<http://site.uit.no/trolling/getting-started/>

- Promotional video
 - User guide
- TROLLing banner

Basic steps in TROLLing

- Create an account
 - Needed only for archiving -- you do not need an account to search or download data
 - This step is self-explanatory, but there is an instructional video
 - It may take a day or two for your account to be approved
- Create a study
 - Enter metadata, upload files in persistent formats, get DOI
- Search for a study
 - TROLLing terms of use

After you have uploaded your study...

- You submit it for approval and receive an acknowledgement
- It will be approved and released by an administrator and you will receive an email
- You will be able to edit your study later if needed and resubmit
- Previous versions of your study are archived, but only the latest version shows up in initial searches

Search for a study

- All of the cataloging information (metadata) is searchable, including:
 - author
 - affiliation
 - country / nation
 - date of production and distribution
 - keywords, e.g. language
 - topic classification
- Advanced search
 - possible to include and exclude combinations of items

Terms of use that users must agree to when downloading files

Affirm that:

- You will not use the materials that you downloaded to identify individuals or organizations
- You will not download or use materials that would be prohibited by law
- You will cite the data as stipulated in the Data Citation Information in any publications or reports that you make using the data