Lexical typology: methodology and theory

Maria Koptjevskaja Tamm
Dept. of linguistics, Stockholm university, tamm@ling.su.se,
and Martine Vanhove
LLACAN / CNRS, Paris, vanhove@vjf.cnrs.fr

,

Most urgent problems in lexical typology

- to refine the existent and develop new methods of data collection

- to improve standards in cross-linguistic identification of studied phenomena and in their (semantic) analysis, and

- to achieve a reasonable consensus on the meta-language used for semantic explications and on the ways of representing meanings

What is ideally needed in a language description for research in lexical typology

Availability of descriptions starting from different angles

- The onomasiological perspective: for the major cognitive domains
- how these are stratified: the list of the expressions covering each, with consistent and systematic meaning definitions) +
- systematic meaning relations to other cognitive domains

- The semasiological perspective: for individual lexical items
  - consistent meaning definitions, making it possible to relate them to the cognitive domains relevant for them
  - information on meaning relations to other lexical items and expressions (synonyms, hyperonyms, etc.)
  - grammatical information (including occurrence in specific constructions)

- "Lexical sensitivity" of grammatical categories and constructions: detailed information on how different classes of lexical units relate to them.

What is really problematic?

Providing all the three perspectives is hardly a problem given modern technology.The real problems - consistency and comparability of descriptions. Some candidates on the market:

- WordNet; FrameNet
- "The interpretational-combinatorial-dictionary" tradition

(Apresjan, Mel'cuk, Iordanskaja)

- Natural Semantic Metalanguage
- Intercontinental Dictionary Series

FrameNet: http://framenet.icsi.berkeley.edu/

FrameNet – a project at the International Computer Science Institute in Berkeley, California (largely due to Charles Fillmore) which produces an electronic resource based on semantic frames. A semantic frame: a concept with a script which is used to describe an object, state or event. The FrameNet lexical database contains around 10,000 lexical units (a pairing of a word with a meaning; polysemous words are represented by several lexical units), 800 semantic frames and over 120,000 example sentences.

Frame Report

Temperature

(http://framenet.icsi.berkeley.edu/index.php?option=com_wrapper&Itemid=118&frame=Temperature&)

Definition:

An Entity has a Temperature characterized by the target. The Temperature is a value of the temperature Attribute.

The pan is already too HOT to touch.

The walk-in was FREEZING, but it was better than hanging out in the kitchen.

Note that in this frame, the Entity does not experience the temperature, but is merely described as being in a certain externally verifiable state. Thus

Open a window; I'm too HOT. is not in frame.

Frame Report (cont.)

FEs:

Core:

Attribute [att]

The feature of an Entity which is under discussion.

Degree [deg]

Semantic Type Degree A modifier expressing the deviation of the Temperature from the norm.

Entity [ent] The Entity for which the temperature Attribute is under consideration.

The soup's too HOT.

Temperature [tem]

Semantic Type Temperature A quantity or other characterization of the Entity's state with respect to the temperature Attribute.

The skillet had a TEMPERATURE of 230 F.

Frame Report (cont.)

Non-Core:

Circumstances [cir] Some specification of the Circumstances under which the Entity has a particular Temperature.

Subregion [sub]

Semantic Type Locative_relation A part of the Entity that has the specified Temperature value.

The pan is HOT on the handle.

Time [tim]

Semantic Type Time The Time during which the Entity is in the state of having a particular Degree for the temperature Attribute.

Inherits From: Measurable_attributes

Is Inherited By: Ambient_temperature

Subframe of:

Frame Report (cont.)

Has Subframes:

Precedes:

Is Preceded by:

Uses:

Is Used By:

Perspective on:

Is perspectivized in:

Is Causative of:

See Also:

Lexical Units

cold.a, cool.a, freezing.a, frigid.a, hot.a, lukewarm.a, scalding.a, temperature.n, tepid.a

What is feasible?

It is hardly feasible to expect that any language description (apart from those for a few best-described languages) will live up to such expectations, in particular in the nearest future. The ways to go:

- give up on lexical typology
- use the available descriptions, combined with questionnaires, and hope for the best
- develop new methods

Basic problems with meanings 1: denotation vs. meaning (concept)

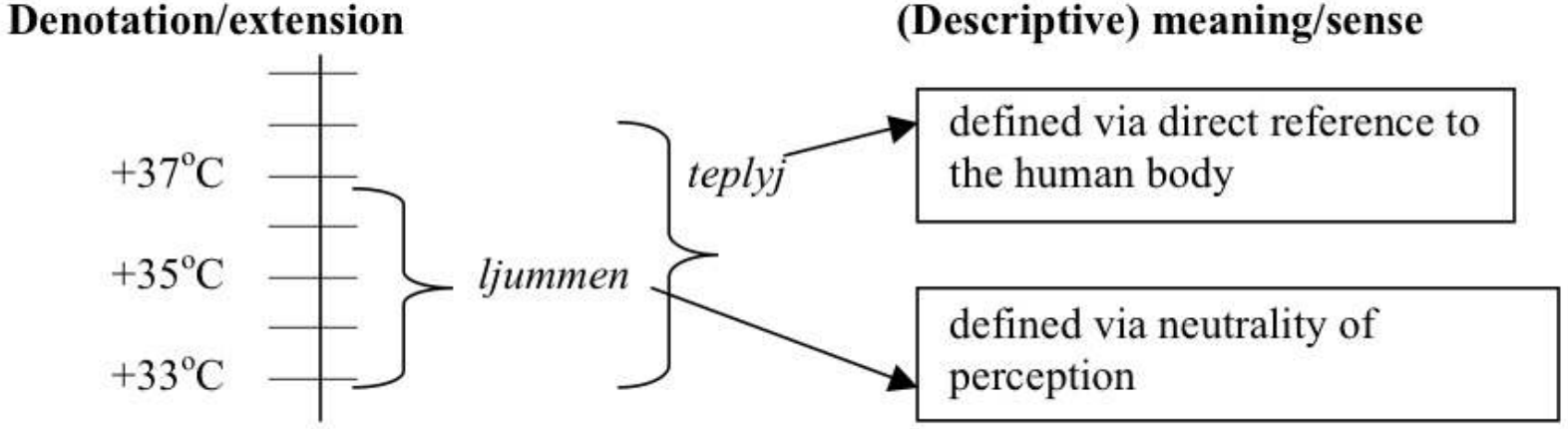


Fig. 2: *Extension/denotation vs. (descriptive) meaning/sense of the temperature adjectives "ljummen" (Swedish) and "teplyj" (Russian)*

Basic problems with meanings 2: polysemy vs. semantic generality

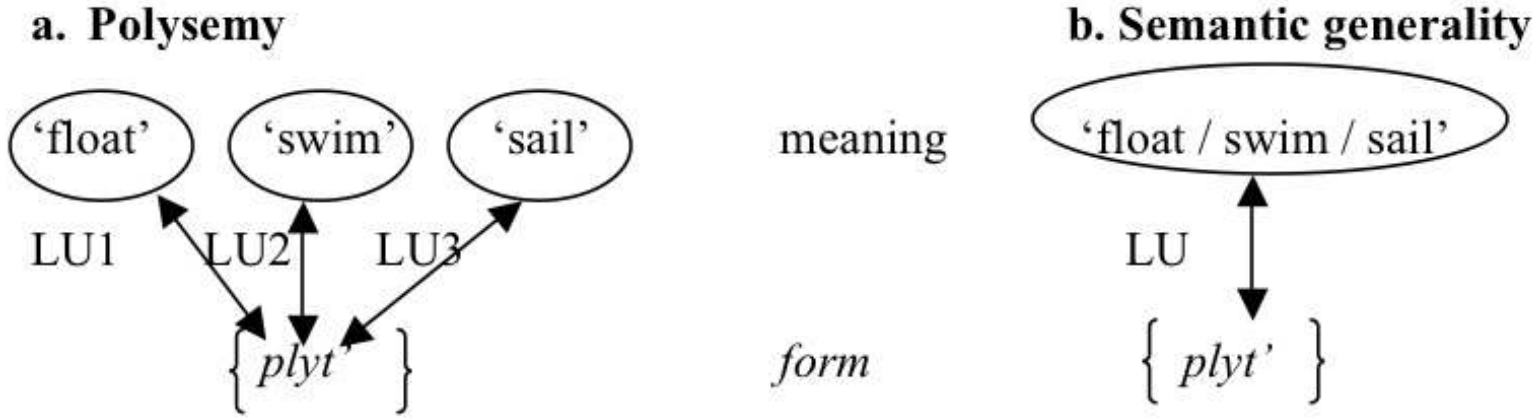


Fig. 1: *Representing polysemy (a) vs. semantic generality (b)*

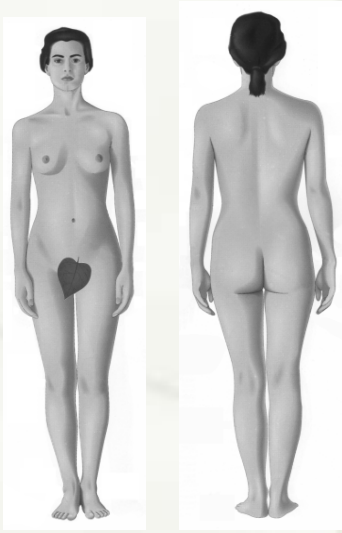
Methods for data collection

A major part of research on lexical typology has been conducted on domains whose denotation / extension lends itself easily to description / stratification by means of simple behaviouristic procedures:

body: pointing, e.g., on a picture (Meira, Kita, Senft, Bohnemeyer, Bowerman, Majid et al., MPI Nijmegen)

colour: naming and classifying coloured chips

http://fieldmanuals.mpi.nl/



Methods

But even here the methodologies may be too far from the actual language use: we do not normally use colour words for describing coloured paper chips, but talk about many different entities in a specific context.

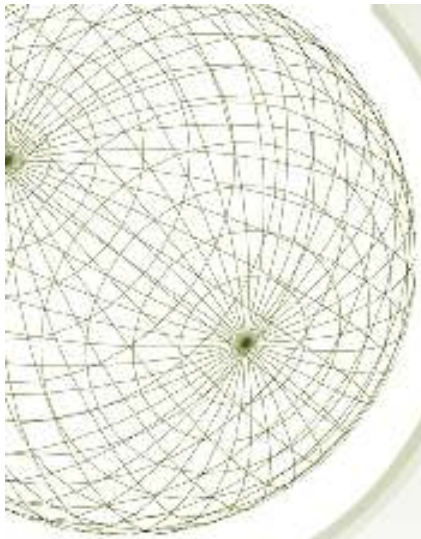
Slightly modified methods:

motion: describing pictures (”Frog Story”), video clips.

Cf. Bernhard Wälchli’s (University at Berne) stimuli (the next 4 slides) for talking about ’posture’ (work in progress)

Methods for data collection: stimuli

Methods for data collection: stimuli

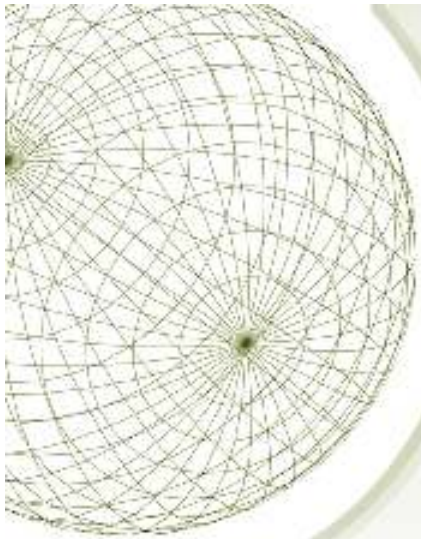


12 °C

An example of a denotation-based mini-research project:
Lisa McGrath, Linnea Hannell (master students at Stockholm University 2009)

Write the word or words that you would use to describe this temperature.

Move to the next slide when you have finished.
You should not spend more than a minute on each slide.

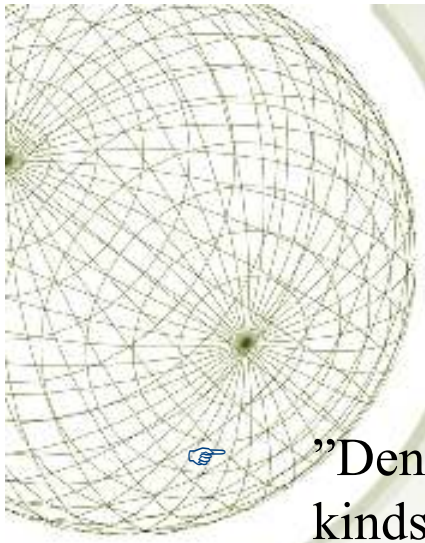


0 °C

An example of a denotation-based mini-research project:
Lisa McGrath, Linnea Hannell (master students at Stockholm University 2009)

Write the word or words that you would use to describe this temperature.

Move to the next slide when you have finished.
You should not spend more than a minute on each slide.



- ”Denotation-based” definitions work differently well for different kinds of situations.

- Quine’s ”Gavagai” problem: how does a learner know what an observed instance of a word used in context refer to?

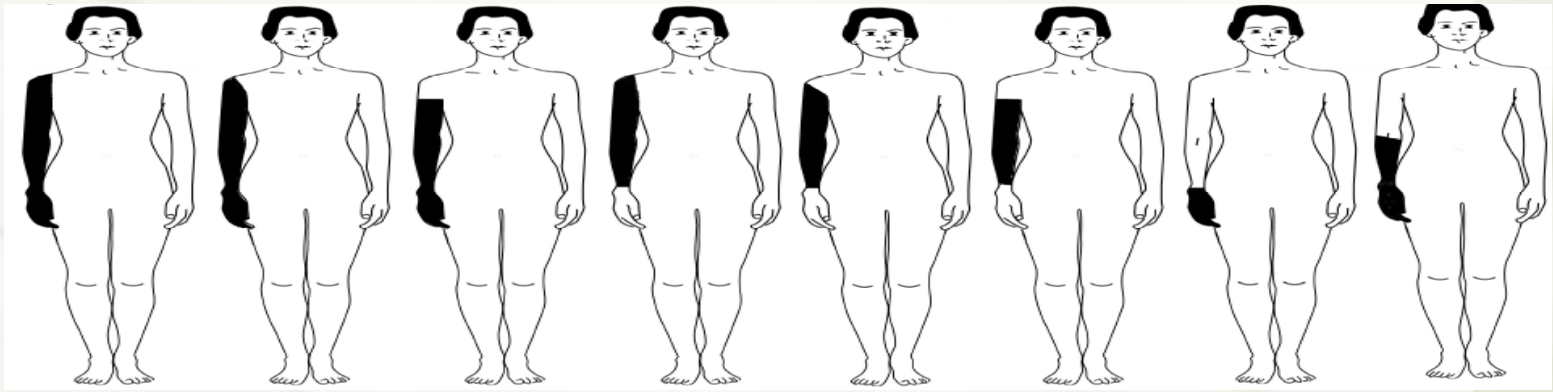
- The methodologies may be too far from the actual language use.

- Other problems (cf. Magdalena Mikołajczyk’s research on body parts in Swedish and Polish)

ręka ”arm”

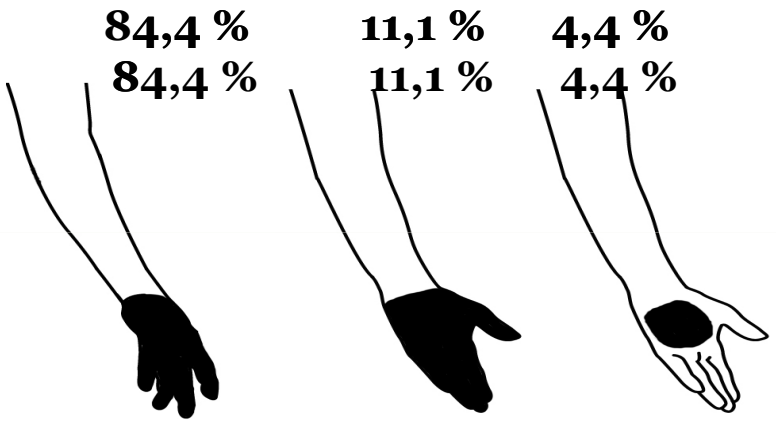
The first study	**77 %**
The second study	**86,6 %**

The first study	3	15	17	3	2	1	4	0
The second study	7	17	15	0	1	2	3	1



dłoń ‘hand’/ ‘palm

The first study
The second study

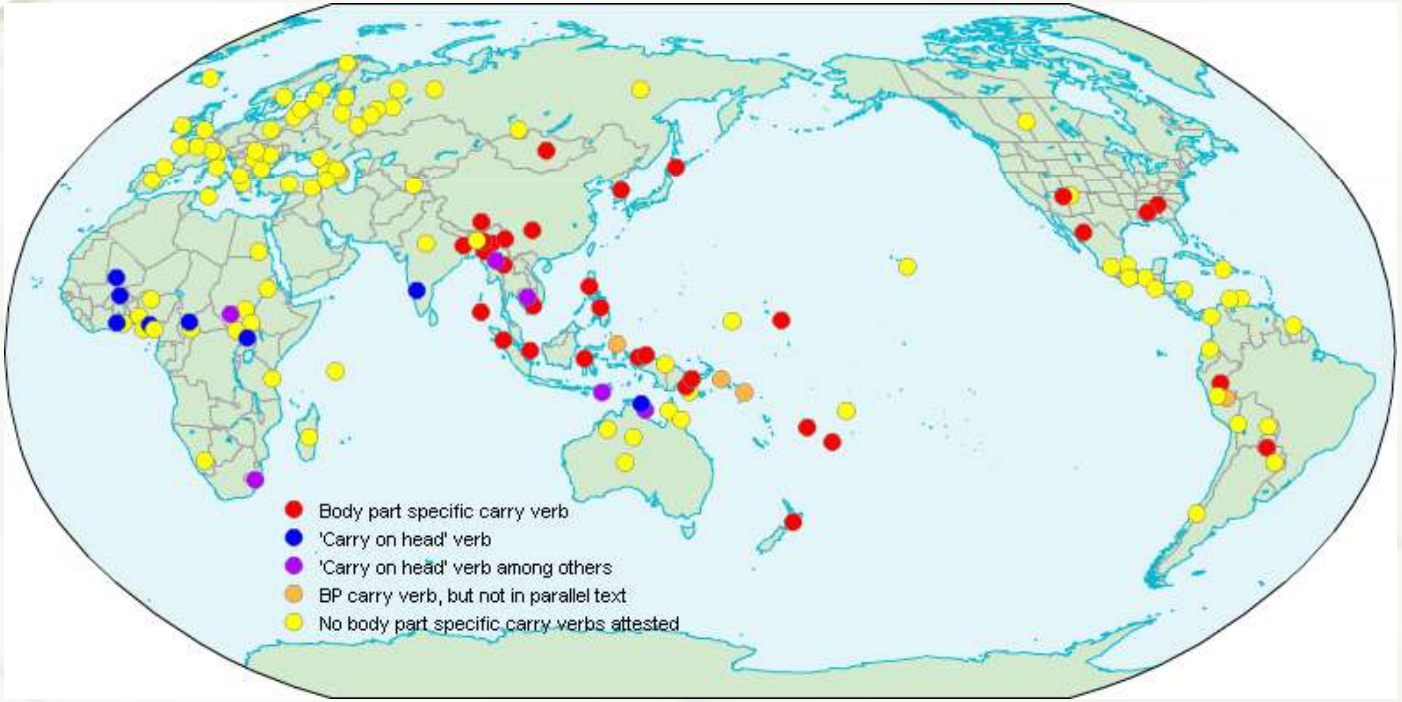


In general, denotation-based methods of data collection and parallel texts neglect the problem of polysemy vs. semantic generality (how to move from an etic definition to an emic one).

The question is whether and how we can discover what the different words and expressions really ”mean” for the speakers of a particular language. Wierzbicka and various other people: what do we know about the colour terms across languages on the basis of the simple colour sorting and naming experiments?

Methods (cont.)

Parallell texts: e.g., Wälchli (University at Berne) on motion verbs in the Gospel according to Mark (165 languages).



Parallell texts for temperature?

ParaSol: A Parallel Corpus of Slavic and other languages http://www.uni-regensburg.de/Fakultaeten/phil_Fak_IV/Slavistik/RPC/

Bulgakov, M. "The Master and Margarita"

Ru: Angličanin, – podumal Bezdomnyj, – iš', i ne žarko emu v perčatkax.

En: 'An Englishman…' thought Bezdomny, 'Phew, he must be hot in those gloves!'

- BSX: …nije mu vrućina u rukavicama!
- Cz: …že mu není horko v těch rukavičkách!
- Pl: …Taki upał, a ten siedzi w rękawiczkach!
- By: …i ne gorjača jamu ŭ pal'čatkax!
- Ger: …daß er nicht schwitzt mit den Handschuhen!
- Sw.: vad varm han måste vara med sina handskar!

Methods (cont.)

Questionnaires of different kinds:

- Viberg's work on various groups of verbs; Ricca's work on deictic verbs, etc.

- "FrameNet"-inspired questionnaires: 'pain' (Rakhilina, Bonch-Osmolovskaya, Reznikova), 'temperature' (Koptjevskaja-Tamm & Rakhilina, Koptjevskaja-Tamm –see www.ling.su/staff/tamm/tempquest.pdf)

Methods (cont.)

- Lists (e.g. Matthias Urban's work on motivation, Andrej Kibrik's work on the lexical-typological profiling, the Loan Word project…)
- Lexical elicitation methods for working with groups of native speakers (Ronald Moe, SIL)
- Natural Language Processing methods:
  - Semantic space models based on mass corpus research (e.g., Magnus Sahlgren's & Maria Koptjevskaja-Tamm's on-going research on temperature)
  - Bruno Gaume's semantic networks based on dictionary data

Methods (cont.): Ronald Moe's mass lexicon elicitation technique

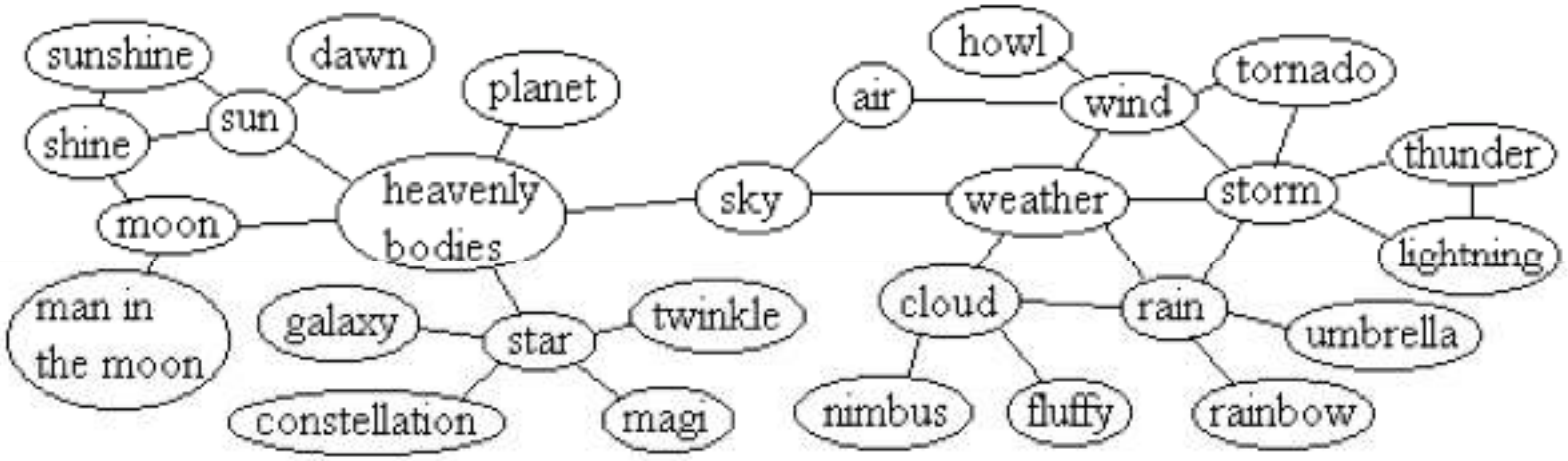


Chart 2: The domain 'Sky' and its subdomains

Methods (cont.): Ronald Moe's mass lexicon elicitation technique

Possible questions related to **wind**

What words describe a wind that lasts for a short time? *breath of air, puff of wind, gust*

What words describe a light wind? *draft, breeze*

What words describe a strong wind? *gale, howling (wind)*

What does the wind do? *blow, freshen, rise, fan (flames)*

What words describe the direction of the wind? *north wind, northeaster, updraft*

What sounds does the wind make? *sigh, moan, whistle, howl, shriek*

Methods for data collection (cont.): Natural Language Processing methods

Semantic space models based on mass corpus research (e.g., Magnus Sahlgren's & Maria Koptjevskaja-Tamm's on-going research on temperature): distributional semantics, where sense representations are compiled from observattions of co-occurrence patterns. The distributional hypothesis: there is a correlation between distributional similarity and meaning similarity, which allows us to utilize the former in order to estimate the latter. This idea is inspired by structural linguistics, and in particular by the distributional methodology of Zellig Harris.

a. Syntagmatic neighbours; b. Paradigmatic neighbours

a. Syntagmatic neighbours

	BNC	REUTERS	SPINN3R
___ COLD	hot	-	ice
	bitterly	-	blow
COLD ___	**war**	**weather**	**war**
	water	**war**	air
	weather	-	**weather**
	air	-	-
	wet	-	-
	politique	-	-
___ CHILLY	bit	-	bit
	dark	-	salt
	rather	-	little
CHILLY ___	air	weather	morning
	patient	temperature	**night**
	reception	**night**	weather
	night	-	ginger
	evening	-	-
	sensitive	-	-
	irritable	-	-
	climate	-	-
___ COOL	keep	-	pretty
	allow	-	liquid
	stay	-	really
	-	-	very
COOL ___	air	weather	stuff
	water	temperature	modern
	drink	-	stroke
	ground	-	-
	down	-	-
	dark	-	-
	breeze	-	-

b. Paradigmatic neighbours

Corpus	BNC	REUTERS	SPINN3R
COLD	hot	inclement	cream
	franco-prussian	mild	cube
	boer	warm	rink
	iran-iraq	wintry	floe
	napoleonic	changeable	skating
	outbreak	cool	berg
	russo-japanese	dry	lolly
	soapy	waging	sundae
	warm	balmy	icepack
	punic	frigid	cone
CHILLY	**warm**	**warm**	**balmy**
	cold	cool	stormy
	cool	mild	tomorrow
	frosty	inclement	**wintry**
	hot	frigid	**warm**
	chill	changeable	dreary
	balmy	**wintry**	drizzly
	stormy	**balmy**	rainy
	wintry	dry	fateful
	foggy	seasonable	blustery
COOL	warm	warm	neat
	hot	mild	darn
	clean	frigid	awesome
	soft	inclement	boring
	cold	changeable	much
	fresh	wintry	excite
	calm	balmy	nice
	gulp	chilly	nifty
	quiet	dry	cute
	chilly	seasonable	scary

Perception and NLP

- An NLP approach of semantic networks based on graph theory (Bruno Gaume)

- http://erss.irit.fr:8080/graph/prox-synonyme-fr/

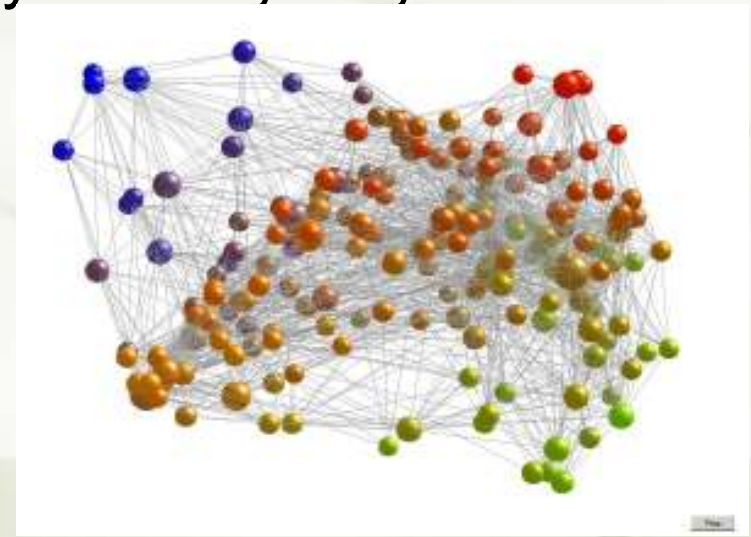
How to automate the research of semantic associations in the lexicon of a language?

1) Resources

- **A semantic network**: paradigmatic links

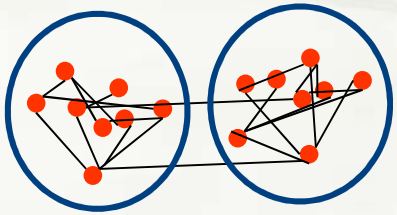
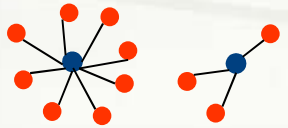
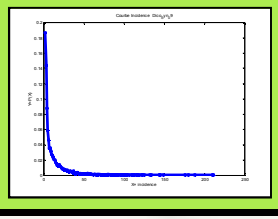
- **Example for French**: compilation of 7 dictionaries of synonyms {Bailly, Benac, Du Chazaud, Guizot, Lafaye, Larousse, Robert} **(≈10.000 verbs)**

A←→B if and only if A is synonymous with B in one of the 7 dictionaries



How to automate the research of semantic associations in the lexicon of a language?

2) Structural properties of semantic networks

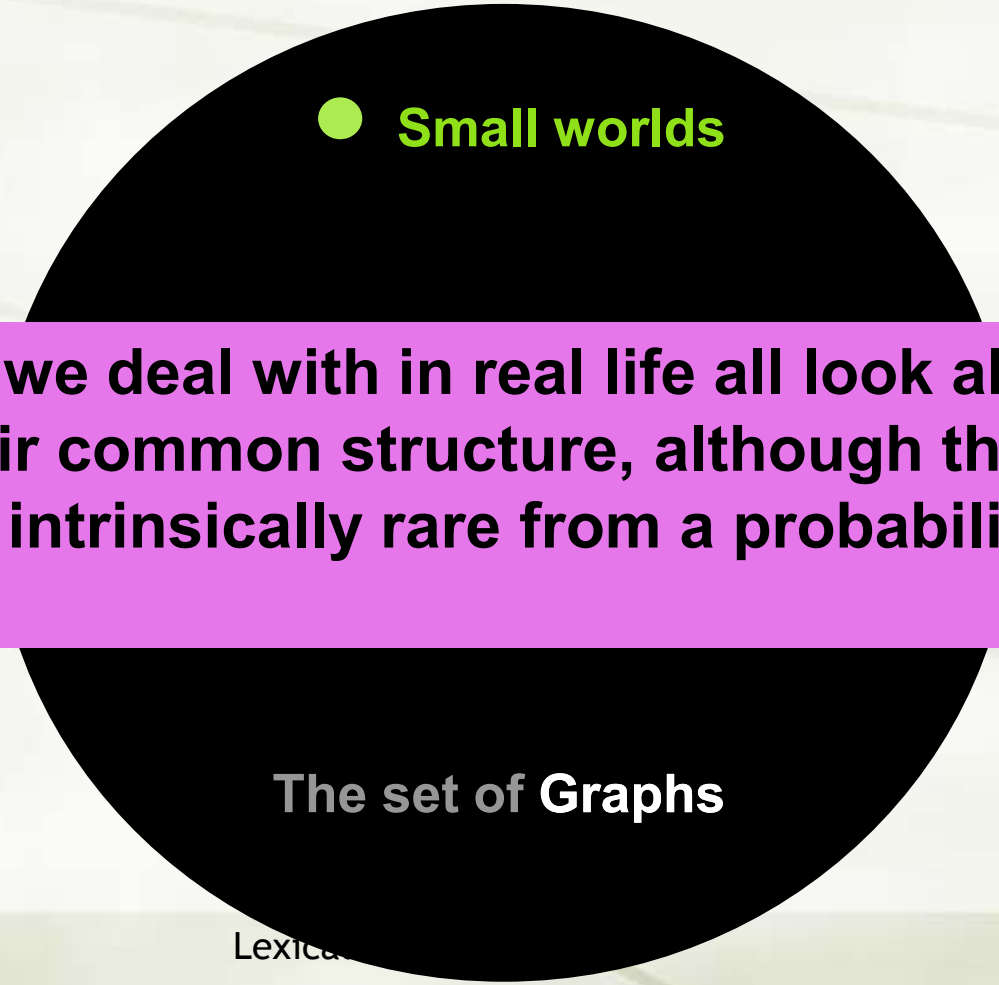
Graphs metrology	Paths	Clusters	Incidence
			
Real-world complex networks	short paths	clusters	hierarchy 

Small worlds

lexical graphs, protein interaction networks, the graph of the worldwide web, the phone calls graphs, the graphs of co-authors of scientific publications, etc.

How to automate the research of semantic associations in the lexicon of a language?

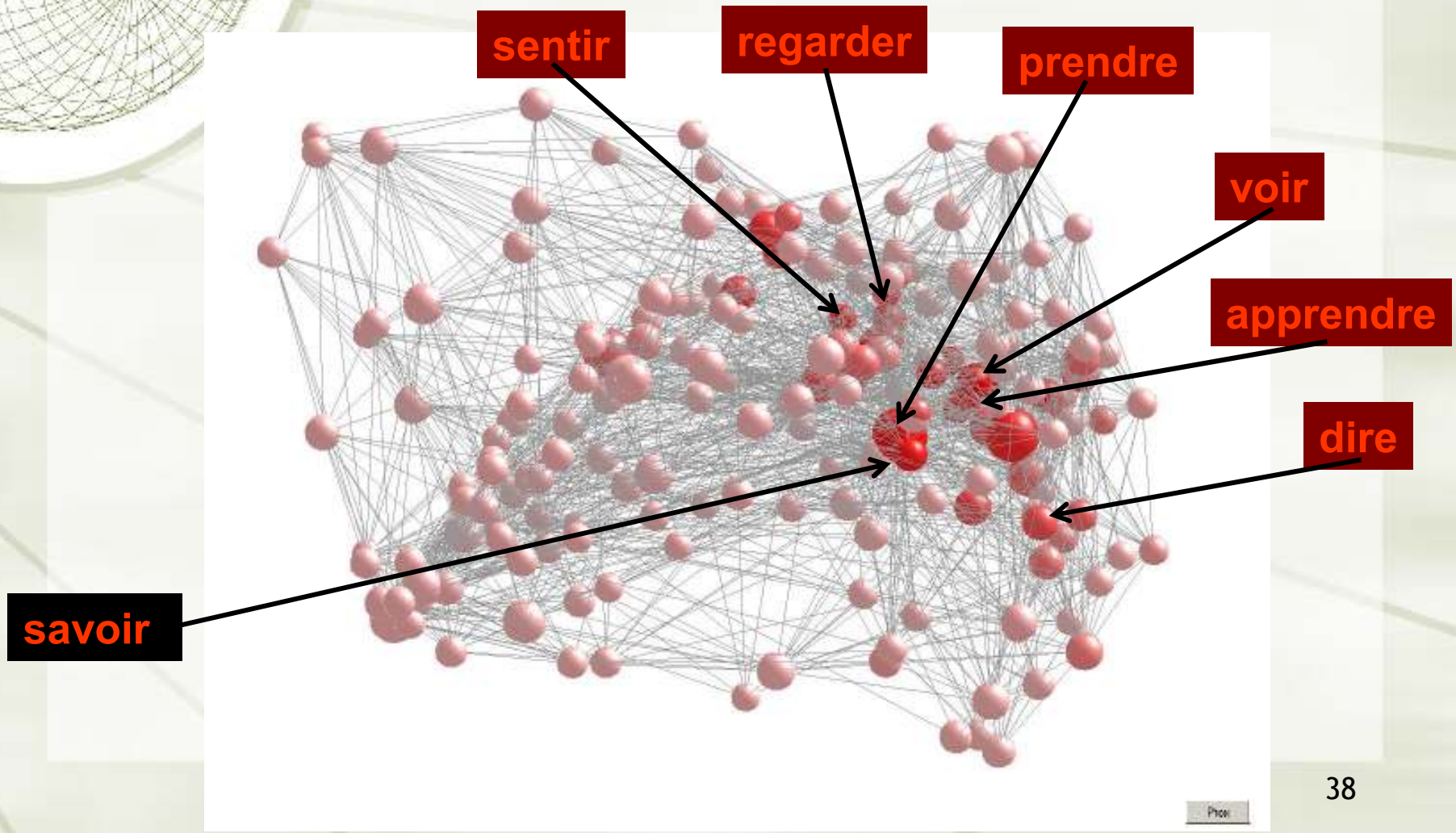
2) Structural properties of semantic networks



The graphs we deal with in real life all look alike through their common structure, although this structure is intrinsically rare from a probabilistic viewpoint

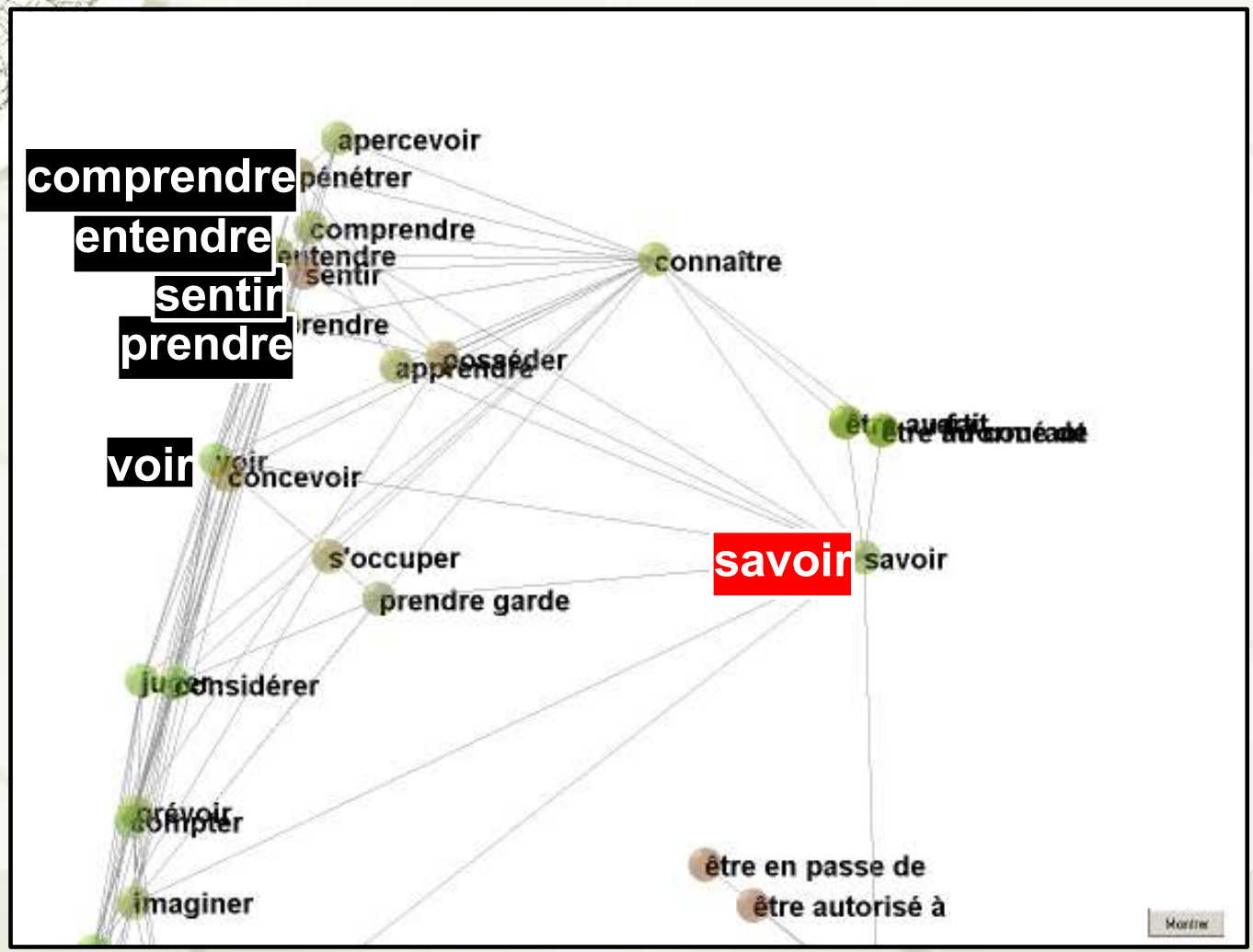
How to automate the research of semantic associations in the lexicon of a language?

3) Prox algorithm: Confluence ≈ semantic association



How to automate the research of semantic associations in the lexicon of a language?

3) Prox algorithm: Confluence ≈ semantic association



How to automate the research of semantic associations in the lexicon of a language?

Savoir : 

1 →connaître, 2 →savoir, 3 →être informé de, 4 →être au courant, 5 →pouvoir, 6 →voir, 7 →être averti, 8 →être au fait, 9 →comprendre, 10 →imaginer, 11 →apprendre, 12 →posséder, 13 penser, 14 →s'attendre, 15 →prendre garde, 16 être apte, 17 apercevoir, 18 être expert, 19 être en mesure de, 20 juger, 21 être capable de, 22 croire, 23 considérer, 24 prendre, 25 concevoir, 26 compter, 27 pénétrer, 28 entendre, 29 être autorisé à, 30 sentir, … 80 ressentir, 81 regarder, 82 examiner, 83 endurer, 84 se représenter, 85 attendre, 86 s'attacher, 87 soupçonner, 88 admettre, 89 faire attention, 90 avoir à, … 111 envisager, 112 voir venir, 113 étudier, 114 percer, 115 avoir soin, … 161 créer, 162 viser, 163 dominer, 164 tenter, 165 écouter, 166 souffrir, 167 donner, 168 assimiler, 169 s'assurer, 170 devoir, 171 projeter, 172 piner, 173 contrôler, 174 travailler, 175 déceler, 176 se faire une idée, 177 se voir, 178 enfermer, 179 passer, 180 visualiser, 181 augurer, 182 indiquer, 183 recevoir, 184 retenir, 185 disposer, 186 fréquenter, 187 démêler, 188 instruire, 189 interpréter, 190 entrer, 191 s'escrimer, 192 bourrer, 193 comporter, 194 accepter, 195 jouir, 196 redouter, 197 fabriquer, 198 anticiper, 199 vouloir, 200 avaler, …, 394 se prendre, 395 loucher, 396 aspirer, 397 se proposer, 398 tabler, …

Apprendre (learn)

1 → **apprendre**, 2 manger, 3 → faire, 4 → se déniaiser, 5 boire, 6 → instruire, 7 → révéler, 8 → dire, 9 → informer, 10 → montrer, 11 **prendre**, 12 → s'abreuver, 13 → annoncer, 14 s'affiner, 15 → se dessaler, 16 → signaler, 17 → se faire, 18 préparer, 19 former, 20 → découvrir, 21 → indiquer, 22 → avertir, 23 → **connaître**, 24 → expliquer, … 34 → travailler, 35 → étudier, 36 signifier, 37 → déclarer, 38 → communiquer, 39 **voir**, … 70 → **comprendre**, … 112 **penser**, … 123 → **savoir**, … 165 **sentir**, … 195 **regarder**, … 260 **faire attention**, … 327 **entendre**, … 486 **vouloir**, … 821 **obéir**, … 1047 **écouter** …

Comprendre (Understand)

1 → **comprendre**, 2 → **connaître**, 3 → **voir**, 4 → **prendre**, 5 → découvrir, 6 → saisir, 7 → deviner, 8 → pénétrer, 9 → **sentir**, 10 → enfermer, 11 → renfermer, 12 → révéler, 13 → compter, 14 faire, 15 → trouver, 16 → embrasser, 17 **penser**, 18 → consister, 19 → déchiffrer, 20 → apercevoir, 21 → percer, 22 → **entendre**, 23 → imaginer, 24 lire, 25 juger, 26 → **apprendre**, 27 réunir, 28 marquer, 29 percevoir, 30 → contenir, 31 → se composer, 32 → concevoir, 33 → admettre, 34 → repérer, 35 joindre, 36 tenir, 37 entourer, 38 → **savoir**, 39 croire, 40 reconnaître, 41 passer, 42 **regarder**, … 241 **vouloir**, … 260 **faire attention**, … 277 **écouter**, … 596 **obéir** …

Connaître (know)

1 → **connaître**, 2 → être expert, 3 → être savant, 4 → être compétent, 5 → être calé, 6 → **savoir**, 7 → **voir**, 8 → être ferré, 9 → être informé de, 10 → être au courant, 11 → **comprendre**, 12 → **sentir**, 13 → **prendre**, 14 → apercevoir, 15 → **penser**, 16 → juger, 17 → **entendre**, 18 → **apprendre**, … 24 → percevoir, … 44 → ressentir, 45 examiner, 46 → tenir de, 47 → supporter, 48 → s'occuper, 49 → pratiquer, 50 → expérimenter, 51 **regarder**, … 62 prendre garde, … 107 **écouter**, … 132 **faire attention**, …153 **vouloir**, … 305 **obéir**

Savoir (know)

1 → **connaître**, 2 → **savoir**, 3 → être informé de, 4 → être au courant, 5 → pouvoir, 6 → **voir**, 7 → être averti, 8 → être au fait, 9 → **comprendre**, 10 → imaginer, 11 → **apprendre**, 12 → posséder, 13 **penser**, 14 → s'attendre, 15 → prendre garde, 16 être apte, 17 apercevoir, 18 être expert, 19 être en mesure de, 20 juger, 21 être capable de, 22 croire, 23 considérer, 24 **prendre**, 25 concevoir, 26 compter, 27 pénétrer, 28 **entendre**, 29 être autorisé à, 30 **sentir**, … 81 **regarder**, … 89 **faire attention**, … 165 **écouter**, … 199 **vouloir**, … 625 **obéir**

Obéir (obey)

1 → se soumettre, 2 → céder, 3 → servir, 4 → **obéir**, 5 → accepter, 6 → suivre, 7 → acquiescer, 8 → se plier, 9 → se conformer, 10 → fléchir, 11 consentir, 12 → admettre, 13 → s'incliner, 14 abandonner, 15 passer, 16 tomber d'accord, 17 → plier, 18 → se ranger, 19 approuver, 20 faire, 21 → satisfaire, 22 donner, 23 → observer, … 30 **prendre**, 31 → rompre, 32 → s'inféoder, 33 → respecter, 34 → **écouter**, … 55 **voir**, … 73 **entendre**, … 84 **regarder**, … 99 **savoir**, … 114 **apprendre**, … 146 **penser**, … 148 **connaître**, … 158 **comprendre**, … 199 **sentir**, … 249 **vouloir**, … 1113 **prendre garde**, … 1302 **faire attention** …

The issue of meta-language for representing the results: ACQUIRE

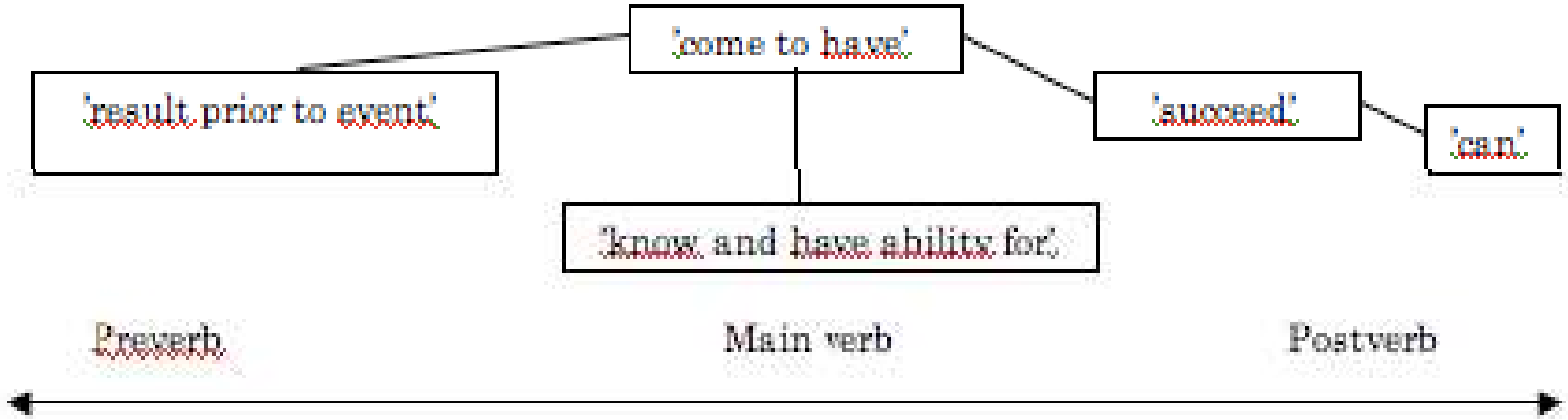


Figure 1 Five meanings of the Lao verb *dâj* 'come to have' (Enfield 2004: 275)

ACQUIRE in SWEDISH

Meaning	Syntactic frame
Possession	*få* + NP$_{Concrete}$
Per fick en kamera. Per got a camera	Per got a camera.
Abstract possession	*få* + NP$_{Abstract}$
Per fick en idé Per got an idea	Per got an idea
Modal: Permission/Obligation	*få* + VP$_{Infinitive}$
Per fick salja kameran. Per got sell camera the	1. Per was allowed to sell his camera. 2. Per had to sell his camera.
Inchoative	*få* +VP$_{Infinitive}$ [V: se, höra, veta]
Per fick se en älg Per got see an elk	Per caught sight of an elk
Causative	*få* + NP + att +VP$_{Infinitive}$
Per fick oss att skratta. Per got us to laugh	Per made us laugh.
Attempt=>Success (A)	*få* + Particle + NP
Per fick upp dörren. Per got up door-the	Per managed to open the door.
Attempt=>Success (B)	*få* + NP + ADJ$_{Result}$
Per fick benen fria Per got legs-the free	Per got his legs free.
Beneficiary/Maleficiary	*få* + NP + Participle
Per fick bilen reparerad/stulen Per got car-the repaired/stolen	Per got his car repaired/stolen

The issue of meta-language for representing the results

HUGE!!! A few examples:

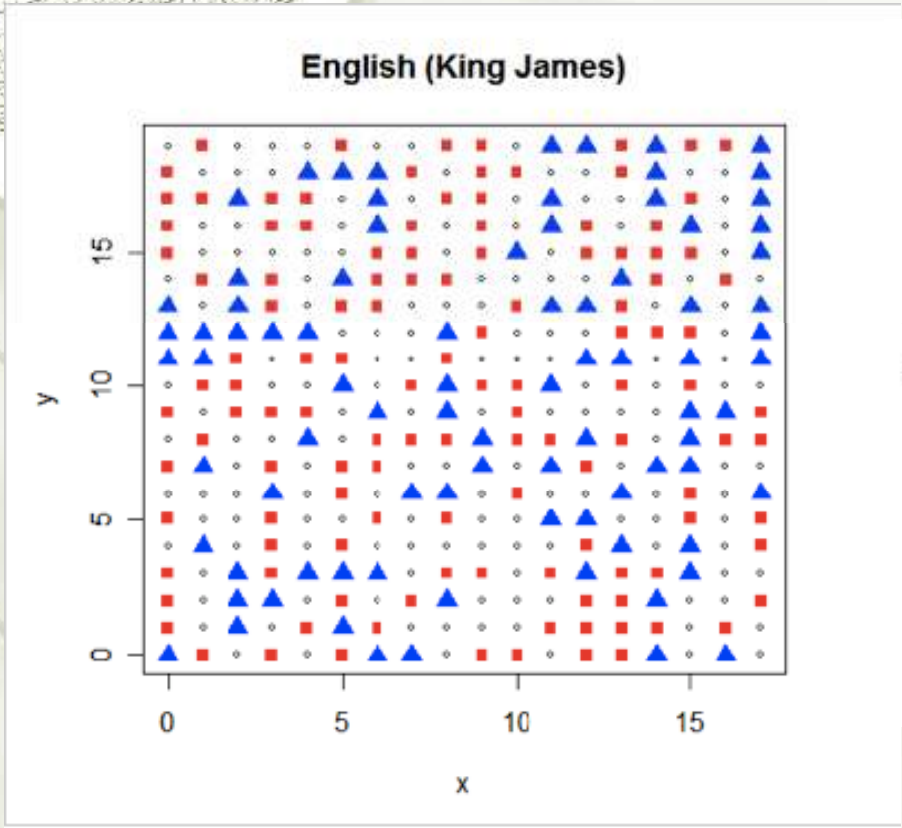
- Multi-dimensional scaling representations (MPI in Nijmegen, Wälchli & Cysouw)
- Alex François' colexification maps
- The Natural Semantic Metalanguage descriptions

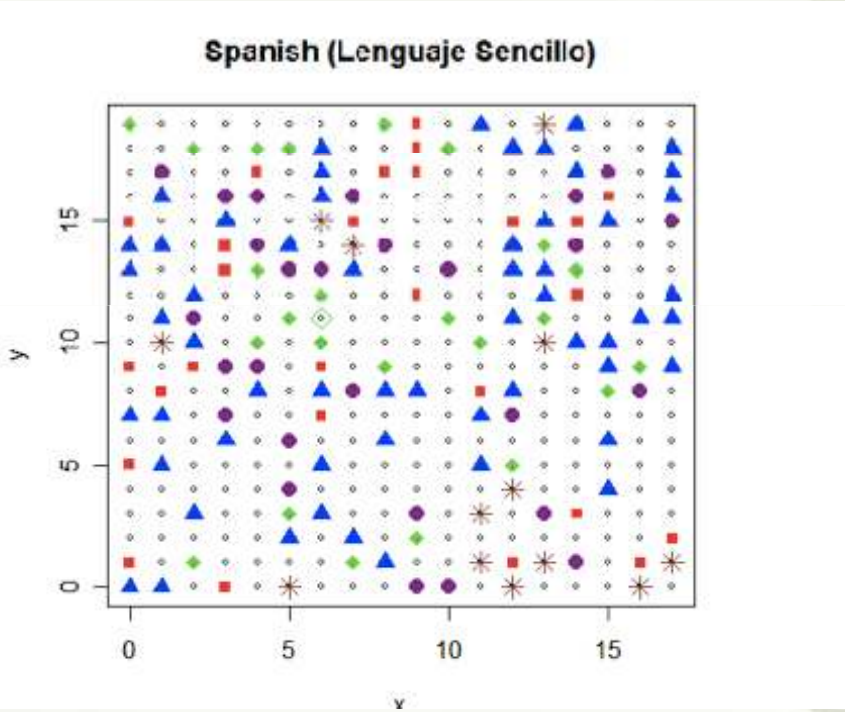
'X is green =

in some places many things grow out of the ground
when one sees things like X one can think of this)'

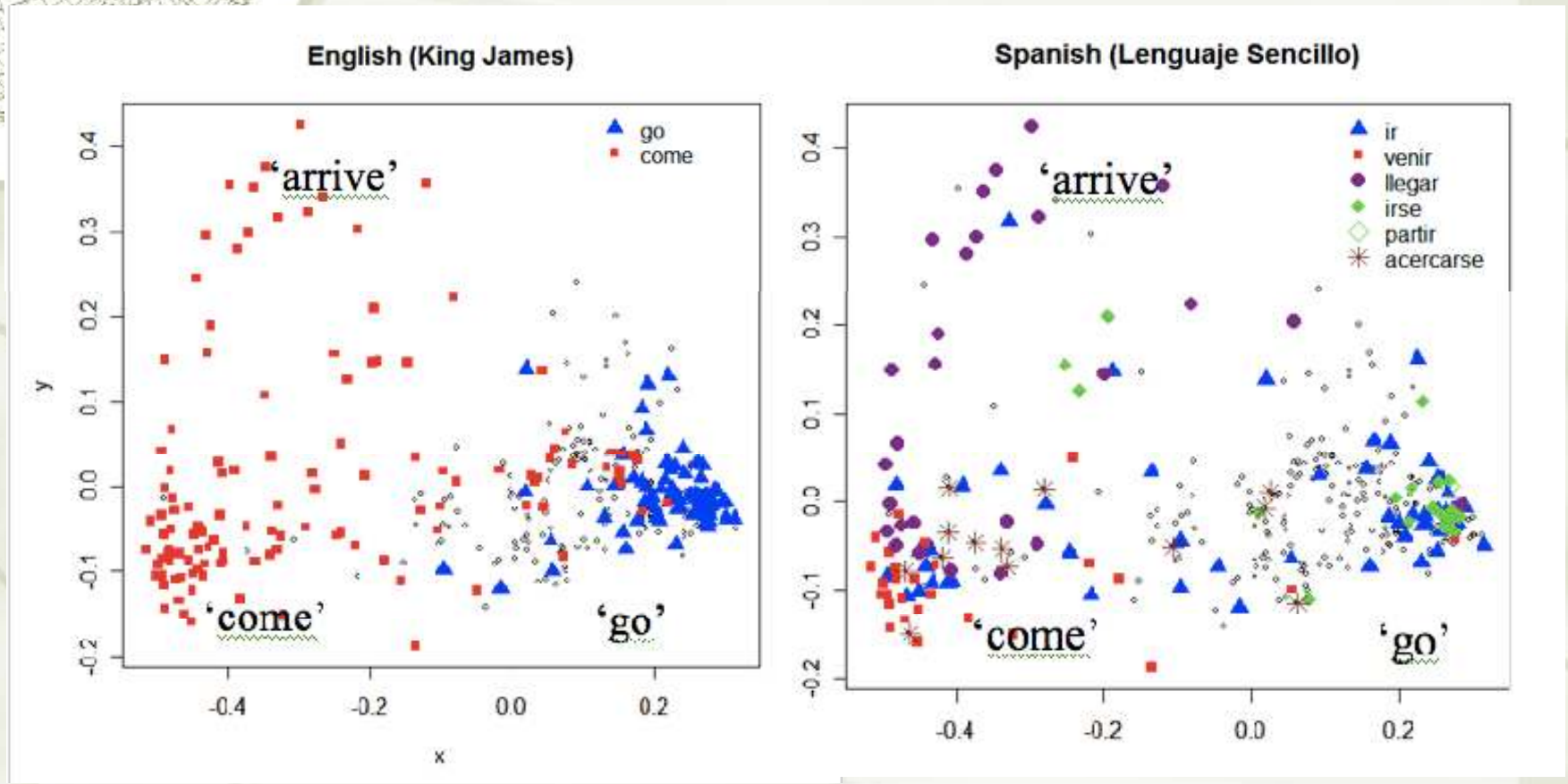
(Viberg 2002)

Translational correspondences of 360 motion events in the Gospel according to Mark: Wälchli & Cysouw





Multi-dimensional scaling representations for translational correspondences of motion events: Wälchli & Cysouw



Alex François, colexification maps: the empirical method

- 1. Select the word that lexifies a notion in one language, and identify the various senses which form part of its polysemy
- 2. Do the same with a second language and add the new senses to the first list
- 3.Then proceed to another language, and expand the list accordingly
- 4. …

Overlapping polysemies

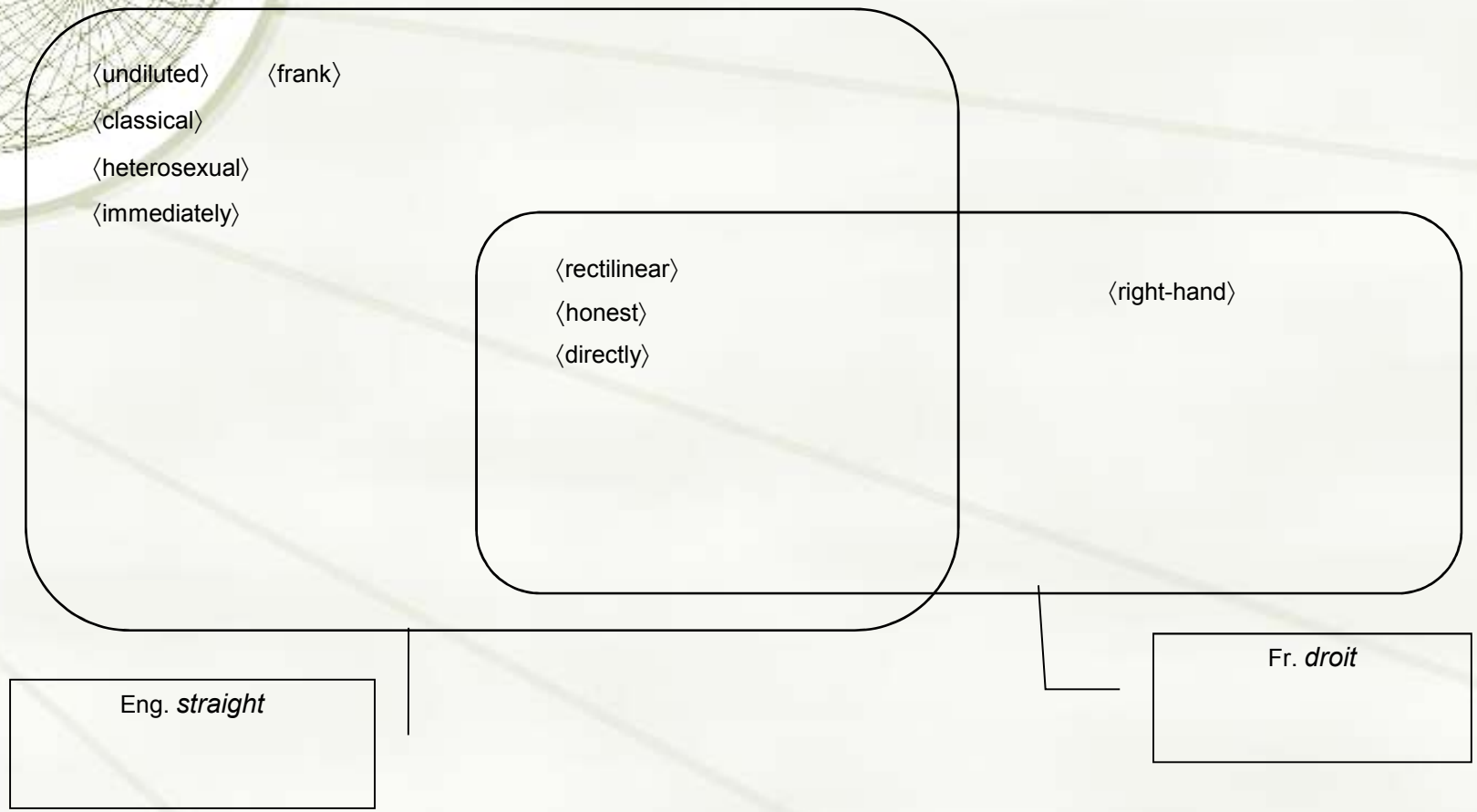
English

<rectilinear>	(*a straight line*)	<heterosexual> (*gay or straight*)
<frank>	(*straight talking*)	<undiluted> (*straight whisky*)
<honest>	(*a straight guy*)	<directly> (*straight to the point*)
<classical>	(*a straight play*)	<immediately> (*straight away*)

French

<rectilinear>	(*un trait droit*)
<directly>	(*aller droit au but*)
<honest>	(*un type droit*)
<right-hand>	(*le côté droit*)

Overlapping polysemies



The empirical method

- ⇒ the list of senses for a given word is likely to evolve and may cover the whole lexicon
- ⇒ the senses to be included in the universal list and in the semantic map should fill one condition: only include those senses that are attested to be in *strict colexification* in at least one language of the world

Colexification

- (1) “A given language is said to COLEXIFY two functionally distinct senses if, and only if, it can associate them with the same lexical form.”
- In synchrony
- Diachrony; lexical derivation; composition
- BUT the different types of formal relations should be kept distinct in the representation of the data

Colexification representations

- In tables of data:
  - '+' = strict synchronic colexification
  - '[+]' = diachronic and heterosemic colexification
- In semantic maps:
  - continuous lines
  - dotted lines

The empirical method

- The meanings are ordered in space
- Iconic grouping of close senses in contiguous areas of the map
- Two criteria: (1) ontological properties of each sense (= common semantic properties); (2) examination of empirical data from various languages.

Semantic maps

- "A semantic map is a geometrical representation of functions in 'conceptual/semantic space' that are linked by connecting lines and thus constitute a network."

Haspelmath (2003: 213)

Semantic maps

- "A semantic map is a geometrical representation of functions in 'conceptual/semantic space' that are linked by connecting lines and thus constitute a network."

"senses"

The empirical method

- Necessity to choose a specific notion as the pivot of the map (≠ Haspelmath's method for drawing grammatical maps)
- ⇒ the empirical data must consist exclusively of lexical units that specifically include this sense in their polysemy. This important requirement is a precaution against the risk of starting an open-ended map with evershifting boundaries

The empirical method

- The status of pivot of a lexical map has nothing to do with the notion of prototype, which is only relevant to the description of individual lexemes.
- The pivot notion of a (universal) lexical map is simply an arbitrary choice, the starting point before any lexical map may even begin to be drawn

Universality claim

- "The configuration of functions shown by the map is claimed to be universal" (Haspelmath 2003: 217).
- -> any new data from a natural language should therefore be able to falsify the results. Cf. Haspelmath (2003: 232)

Universality vs Diversity

- A universal grid serves to visualize the "emic" categorizations which are made by each specific language
- For a given form in a given language – usually understood in synchronical terms – it is possible to identify, on the universal map, those meanings that are covered by this form, and those that fall without its scope.

CASE STUDY: {BREATHE}

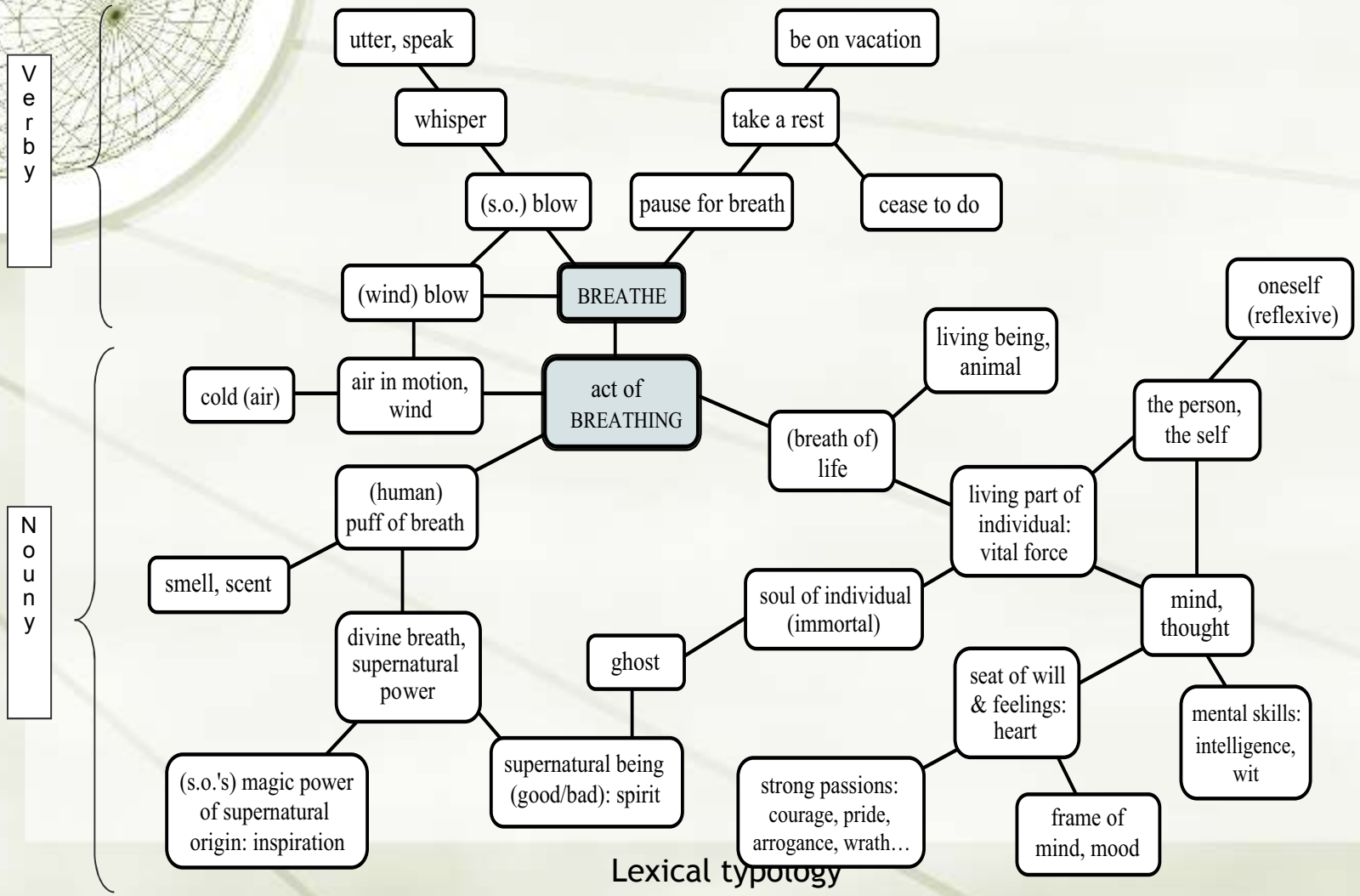
- 16 lexical headwords in 13 genetically diverse languages.
- The default headword is the noun. The cognate verb, when formally different, has a secondary status (loose colexification)

BREATHE

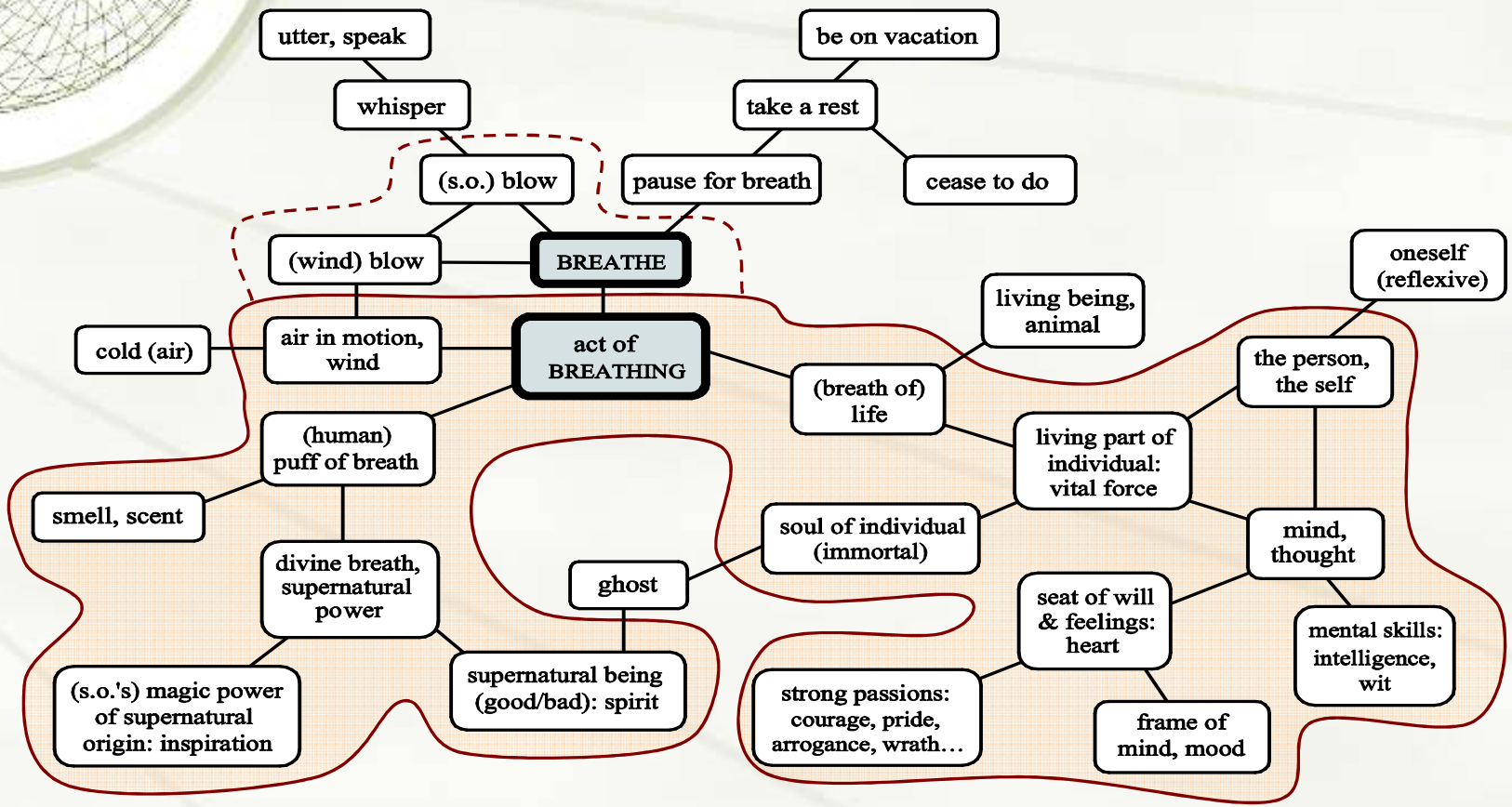
	SANSKRIT *ātman*	GREEK *psūkhē*	GREEK *pneuma*	LATIN *anima*	LATIN *spīritus*	RUSSIAN *dux*	MANDARIN *qì*	ALEUT* *anri-*	NAHUATL *imi'iyo*	MWOTLAP *mōkhe-*	TEUEMVA *horêâ-*	ARABIC *rūḥ*	ARABIC *nafas*	BEJA *šūk*	SIR *koo*
BREATHE	[+]	[+]	[+]		[+]	[+]		[+]		[+]	+		[+]		+
(s.o.) blow		[+]	[+]		[+]	[+]		[+]		[+]	+		[+]		+
whisper, utter								+			+				
take a rest						[+]			+	[+]	+	[+]	[+]		[+]
be on vacation						[+]				[+]					
cease to do											+				
(wind) blow			[+]		[+]	[+]						[+]			
air, wind	[+]	[+]	+	+	+	[+]	+					[+]			+
cold (air)		[+]													
puff of breath	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
smell, scent			+		+	[+]	+		+	+		[+]			
ACT OF BREATHING	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
(breath of) life	+	+	+	+	+	+	+	+		+	+	+			
living being, animal	[+]	[+]		[+]		[+]									
vital force of individual	+	+	+	+	+	+	+	+		+		+	+	+	
person; self	+	+		+	+							[+]	[+]		
oneself (reflexive)	+											[+]	[+]		
mind, thought	+	+	+	[+]	+	+	+	+				+	[+]		
intelligence, wit	+	+													
will and feelings: heart		+	+	[+]	+	+	+					+			
pride, arrogance, wrath			+	[+]	+	+	[+]								
frame of mind, mood		+		[+]	+	+	+					+			
soul of indiv. (immortal)	+	+		+	+	[+]		+				+		+	
ghost		+		+		+		+				+			
divine breath or power			+		+	+						+			
magic power, inspiration			+		+	[+]						+			
supernatural being, God	+		+		+	+						+			

Lexical data on the polysemy of {BREATHE}

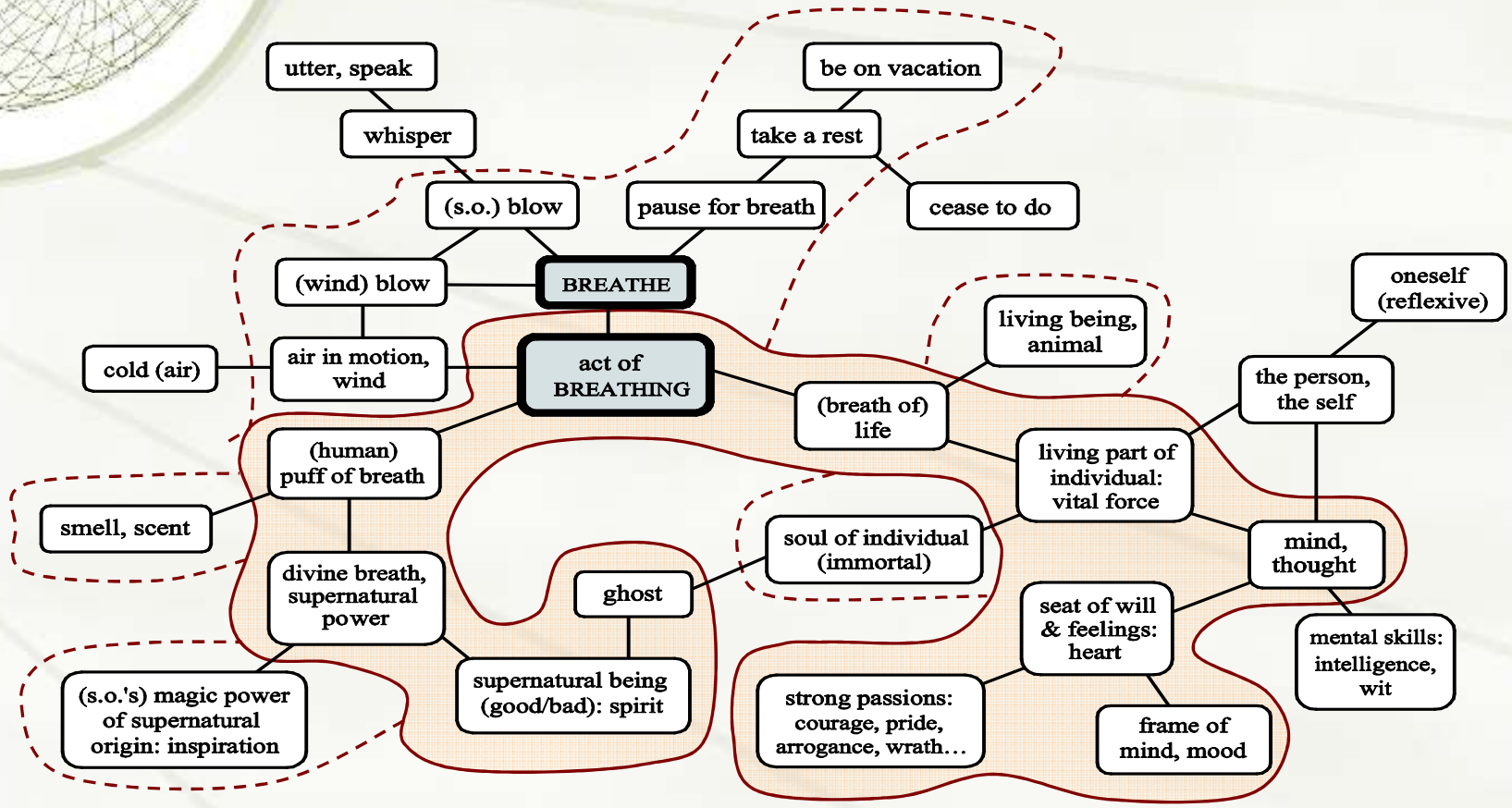
Colexification of {BREATHE}



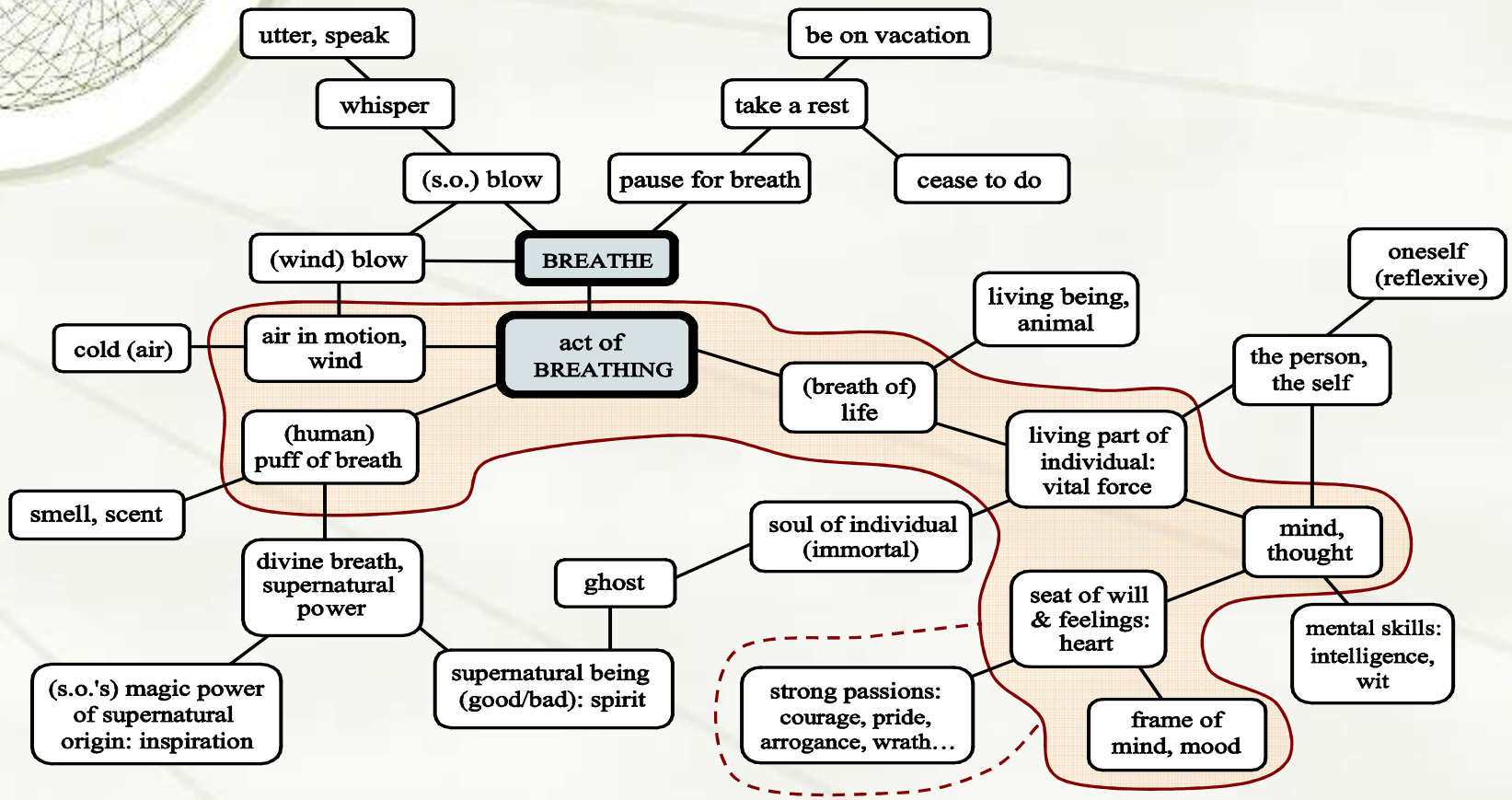
BREATHE


utter, speak
whisper
(s.o.) blow
(wind) blow
BREATHE
cold (air)
air in motion, wind
act of BREATHING
(human) puff of breath
smell, scent
divine breath, supernatural power
(s.o.'s) magic power of supernatural origin: inspiration
ghost
supernatural being (good/bad): spirit
be on vacation
take a rest
pause for breath
cease to do
living being, animal
(breath of) life
oneself (reflexive)
the person, the self
living part of individual: vital force
soul of individual (immortal)
mind, thought
seat of will & feelings: heart
mental skills: intelligence, wit
strong passions: courage, pride, arrogance, wrath…
frame of mind, mood

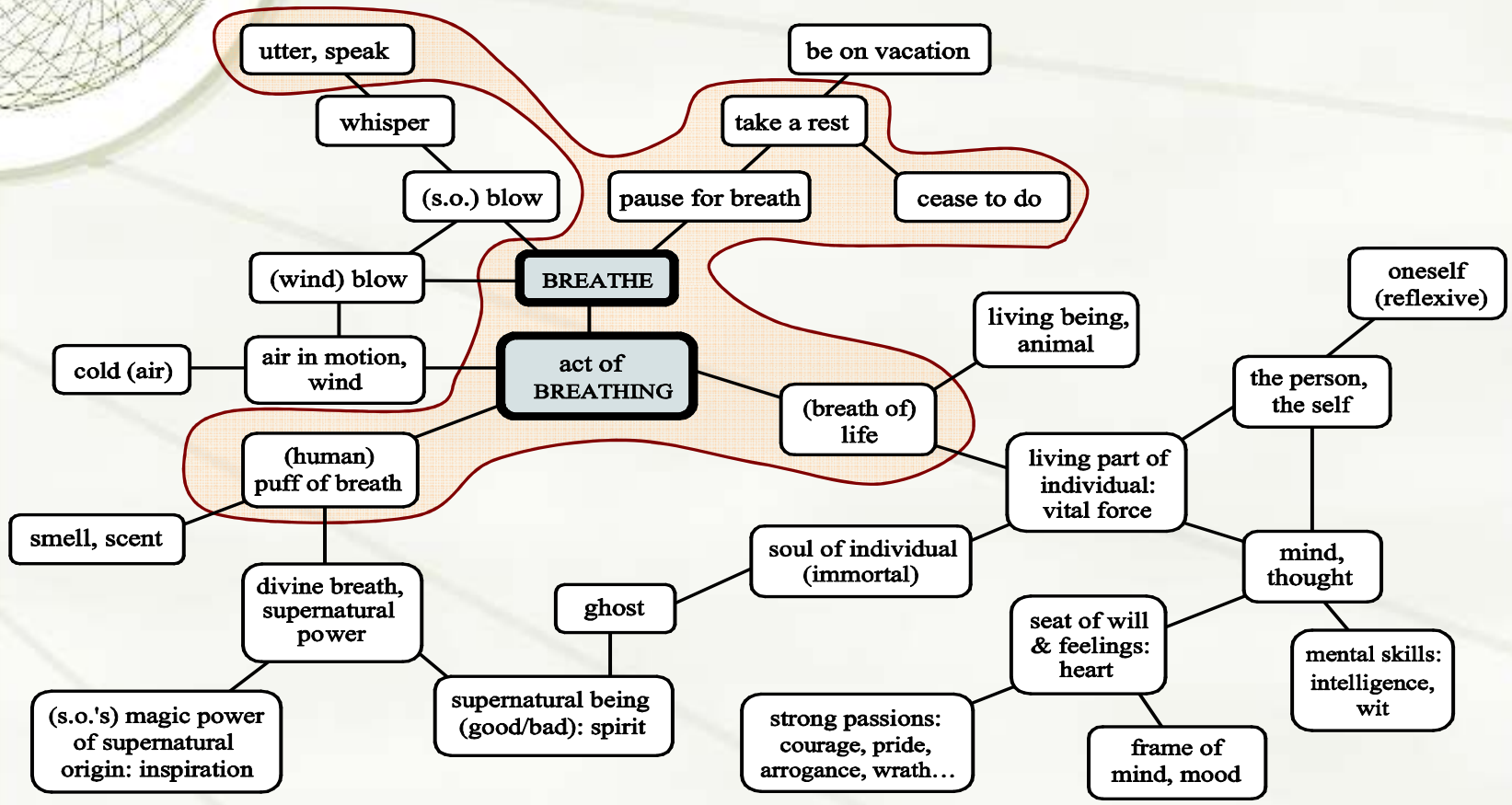
BREATHE


utter, speak
whisper
(s.o.) blow
(wind) blow
cold (air)
air in motion, wind
(human) puff of breath
smell, scent
divine breath, supernatural power
(s.o.'s) magic power of supernatural origin: inspiration
BREATHE
act of BREATHING
ghost
supernatural being (good/bad): spirit
be on vacation
take a rest
pause for breath
cease to do
living being, animal
(breath of) life
soul of individual (immortal)
oneself (reflexive)
the person, the self
living part of individual: vital force
mind, thought
seat of will & feelings: heart
mental skills: intelligence, wit
strong passions: courage, pride, arrogance, wrath…
frame of mind, mood

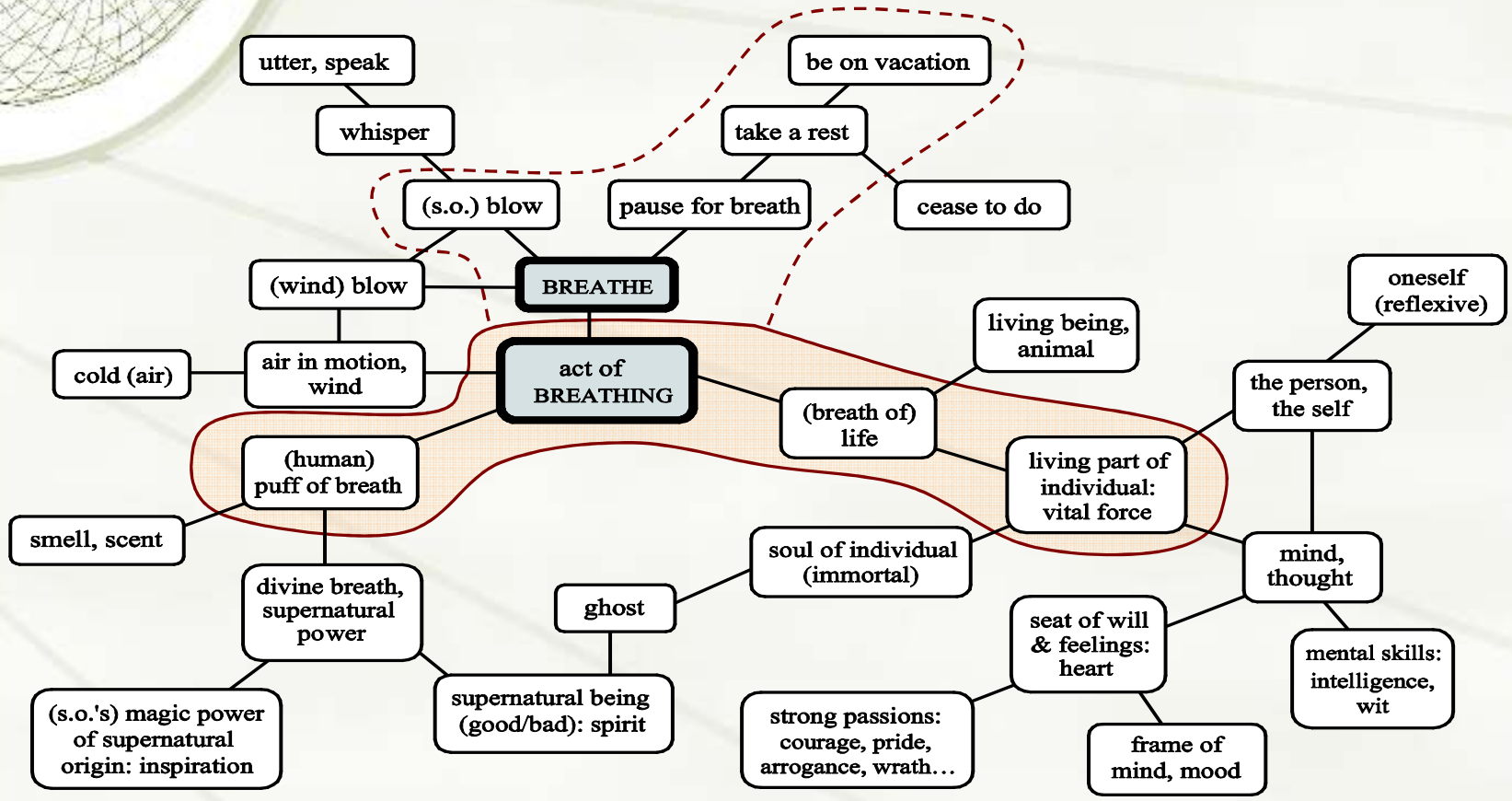
BREATHE


utter, speak
whisper
(s.o.) blow
(wind) blow
BREATHE
cold (air)
air in motion, wind
act of BREATHING
(human) puff of breath
smell, scent
divine breath, supernatural power
(s.o.'s) magic power of supernatural origin: inspiration
ghost
supernatural being (good/bad): spirit
be on vacation
take a rest
pause for breath
cease to do
living being, animal
(breath of) life
soul of individual (immortal)
strong passions: courage, pride, arrogance, wrath…
oneself (reflexive)
the person, the self
living part of individual: vital force
mind, thought
seat of will & feelings: heart
mental skills: intelligence, wit
frame of mind, mood

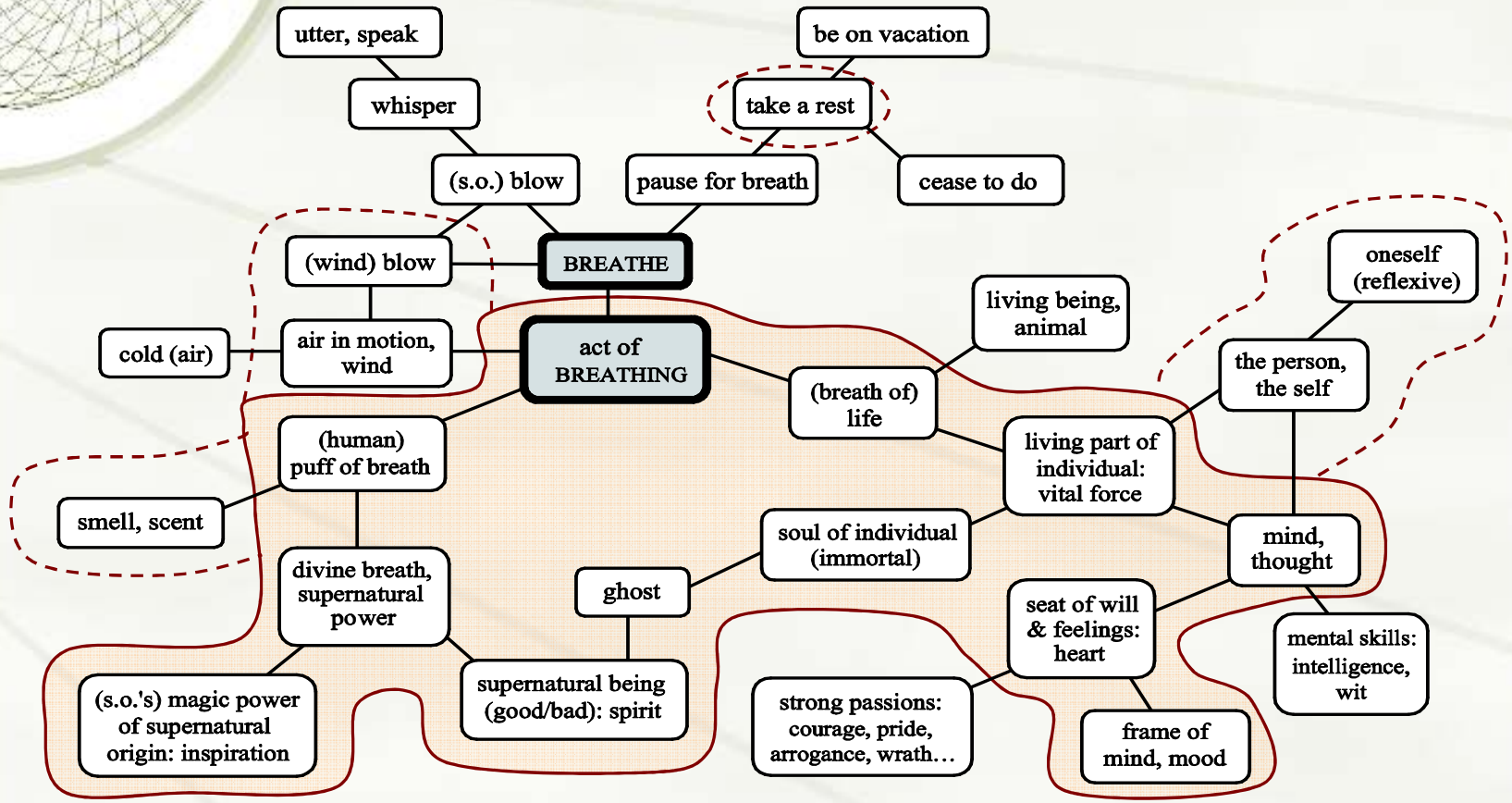
BREATHE


utter, speak
whisper
(s.o.) blow
(wind) blow
cold (air)
air in motion, wind
(human) puff of breath
smell, scent
divine breath, supernatural power
(s.o.'s) magic power of supernatural origin: inspiration
supernatural being (good/bad): spirit
ghost
BREATHE
act of BREATHING
be on vacation
take a rest
pause for breath
cease to do
living being, animal
(breath of) life
soul of individual (immortal)
living part of individual: vital force
oneself (reflexive)
the person, the self
mind, thought
mental skills: intelligence, wit
seat of will & feelings: heart
frame of mind, mood
strong passions: courage, pride, arrogance, wrath…

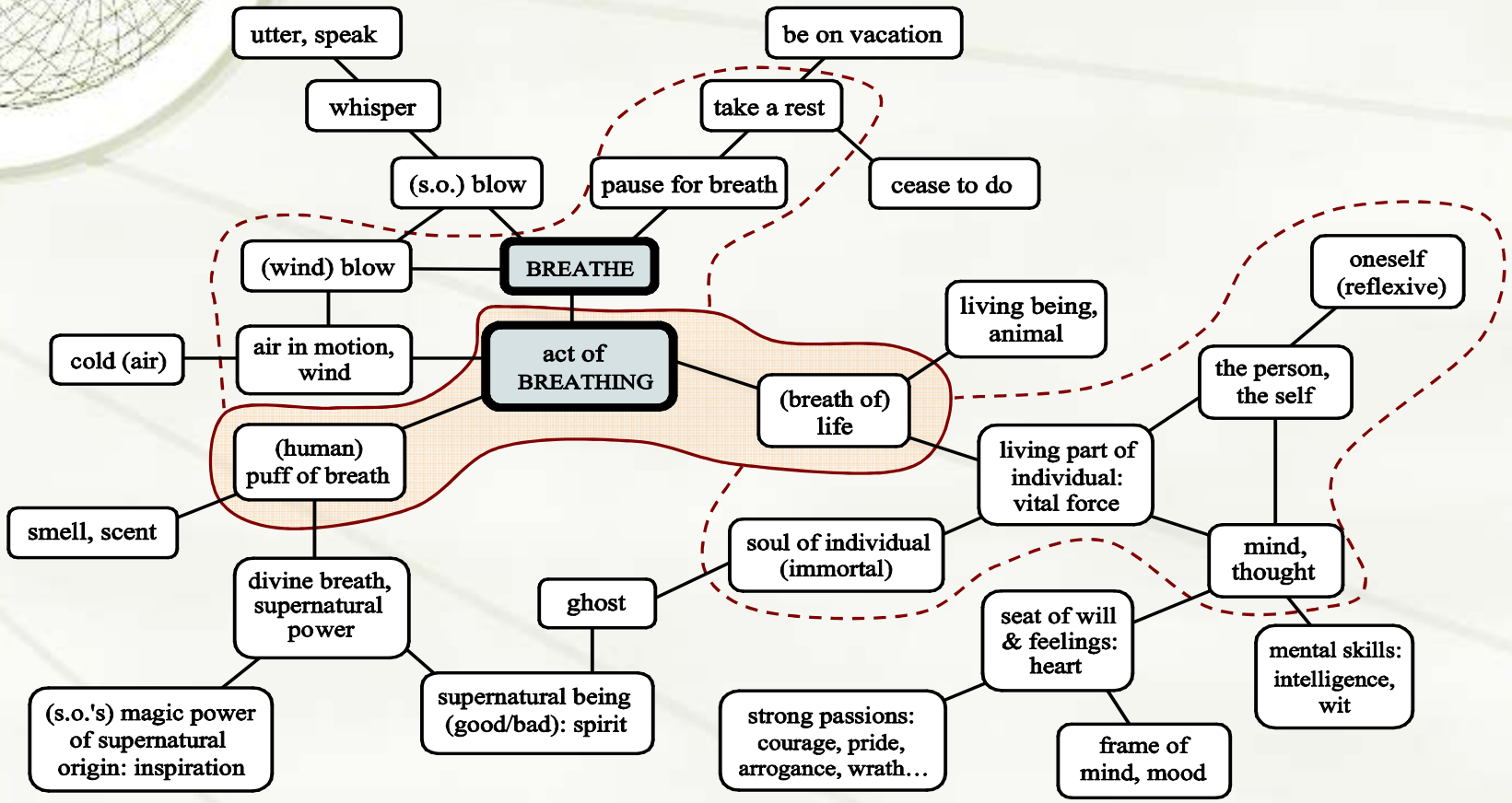
BREATHE


utter, speak
whisper
(s.o.) blow
(wind) blow
cold (air)
air in motion, wind
(human) puff of breath
smell, scent
divine breath, supernatural power
(s.o.'s) magic power of supernatural origin: inspiration
supernatural being (good/bad): spirit
ghost
BREATHE
act of BREATHING
be on vacation
take a rest
pause for breath
cease to do
living being, animal
(breath of) life
soul of individual (immortal)
living part of individual: vital force
strong passions: courage, pride, arrogance, wrath…
seat of will & feelings: heart
frame of mind, mood
oneself (reflexive)
the person, the self
mind, thought
mental skills: intelligence, wit

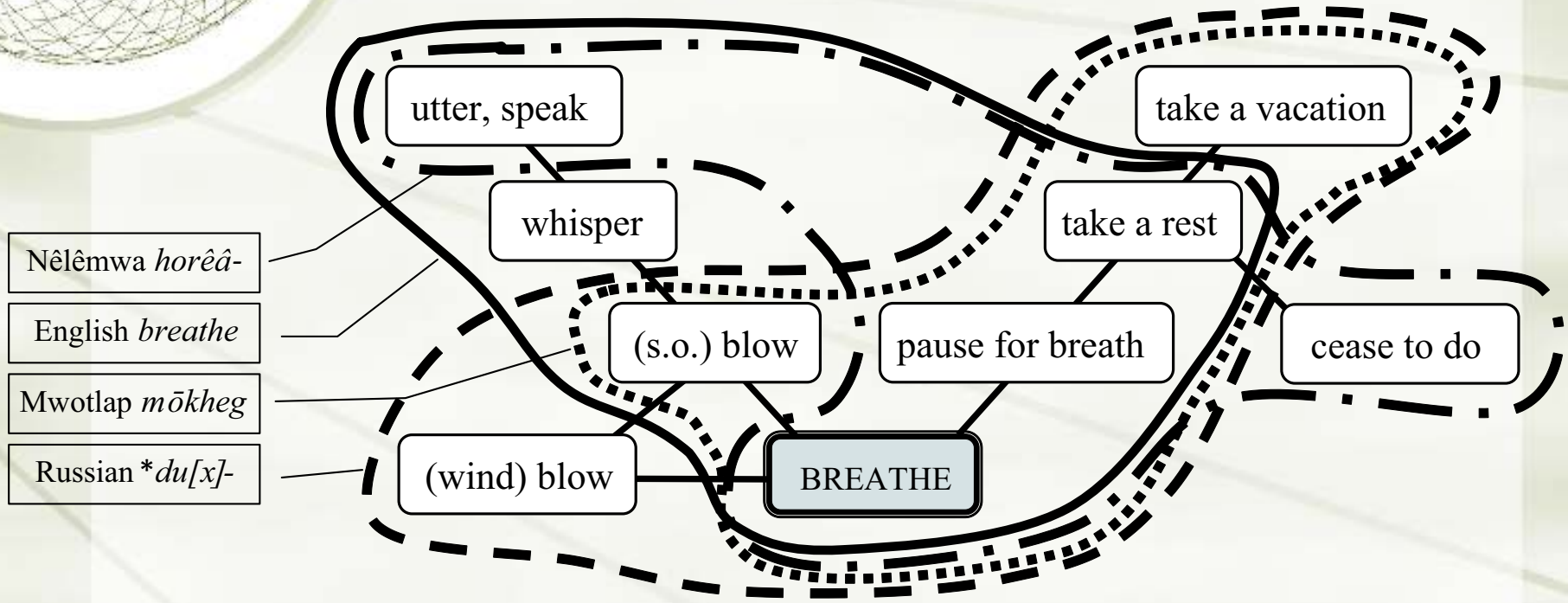
BREATHE


utter, speak
whisper
(s.o.) blow
be on vacation
take a rest
pause for breath
cease to do
(wind) blow
BREATHE
cold (air)
air in motion, wind
act of BREATHING
living being, animal
oneself (reflexive)
the person, the self
(breath of) life
living part of individual: vital force
(human) puff of breath
smell, scent
soul of individual (immortal)
mind, thought
divine breath, supernatural power
ghost
seat of will & feelings: heart
mental skills: intelligence, wit
(s.o.'s) magic power of supernatural origin: inspiration
supernatural being (good/bad): spirit
strong passions: courage, pride, arrogance, wrath…
frame of mind, mood

BREATHE


utter, speak
be on vacation
whisper
take a rest
(s.o.) blow
pause for breath
cease to do
(wind) blow
BREATHE
oneself (reflexive)
living being, animal
cold (air)
air in motion, wind
act of BREATHING
the person, the self
(breath of) life
(human) puff of breath
living part of individual: vital force
smell, scent
soul of individual (immortal)
mind, thought
divine breath, supernatural power
ghost
seat of will & feelings: heart
mental skills: intelligence, wit
(s.o.'s) magic power of supernatural origin: inspiration
supernatural being (good/bad): spirit
strong passions: courage, pride, arrogance, wrath…
frame of mind, mood

Some isolectic sets around the notion {BREATHE}



NSM for cross-linguistic comparison

Someone X is drinking something Y:

a. someone X is doing something to something Y for some time **lexico-syntactic**
because of this, something is happening to this something at the same time **frame**

b. at many times someone does something like this to something when it is like this:
- this someone wants this something to be inside their body **prototypical moti-**
- this something is something like water [m] **vational scenario**

c. when someone does something like this to something for some time **manner**
the same thing happens many times
it happens like this:
- this someone does something to this something with their mouth [m]
- because of this, after this, part of this something is for a very short time inside this someone's mouth [m]
- after this, this someone does something else to it with their mouth [m]
- because of this, after this, it is not inside this someone's mouth [m] anymore,
  - it is somewhere else inside this someone's body for some time

NSM for cross-linguistic comparison

Someone X is eating something Y:

a. someone X is doing something to something Y for some time **lexico-syntactic**
because of this, something is happening to this something at the same time **frame**

b. at many times someone does something like this to something when it is like this:
this someone wants this something to be inside their body **prototypical moti-**
this something is something not like water [m] **vational scenario**

c. when someone does something like this to something for some time **manner**
the same thing happens many times
it happens like this:
this someone does something to this something with their mouth [m]
because of this, after this, part of this something is for a very short time inside this someone's mouth [m]
after this, this someone does something else to it with their mouth [m]
because of this, after this, it is not inside this someone's mouth [m] anymore,
it is somewhere else inside this someone's body for some time

NSM for cross-linguistic comparison

*Someone X is ñb-ing something Y (*Kalam):

a. someone X is doing something to something Y for some time **lexico-syntactic**
because of this, something is happening to this something at the same time **frame**

b. at many times someone does something like this to something when it is like this:
this someone wants this something to be inside their body **prototypical motivational scenario**

c. when someone does something like this to something for some time **manner**
the same thing happens many times
it happens like this:
this someone does something to this something with their mouth [m]
because of this, after this, part of this something is for a very short time inside this someone's mouth [m]
after this, this someone does something else to it with their mouth [m]
because of this, after this, it is not inside this someone's mouth [m] anymore,
it is somewhere else inside this someone's body for some time

A typologist on the cross-roads (alt. at a loss)

Some recurrent patterns in our common experience as typologists:

- you spend days and days looking for relevant information in language descriptions, but you are never sure about its quality, and language experts keep criticising you for the endless big and small errors you have in your data;
- you make questionnaires and check-lists for language experts and ask them various questions; some of the language experts get interested and excited, are helpful and even grateful for the new challenges – but a large portion of the questionnaires never comes back to you.

Comparing experiences: language experts as "consultants"

- EuroTyp (adnominal possession) - relatively simple
- WALS (nominalisations) - difficult, both rewarding and frustrating
- Trying to extend temperature research to other languages - frustrating and more or less meaningless

The future research: language experts and typologists as equal collaborators

Good examples:

- the aqua-motion and pain projects in Moscow
- the work of the "language and cognition"-group at MPI in Nijmegen
- the temperature project

Sampling: large-scale projects have probably to wait.