

# Ontological Model of Lexical Concepts and Constructions

From Data to Knowledge Based Visualization



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# Ontological Model of Lexical Concepts and Constructions

Language is a symbolic tool that enables human representation and categorization of the world via conventionalized linguistic expressions (Langacker 2008).

- languages convey the knowledge about the world
- model our representation of the world (Casasanto 2016) .

Question: Can we and how visualize linguistic knowledge (meaning) and linguistic modeling of knowledge?

ljutnja gađenje strah krivnja sreća ljubav ponos tuga sram iznenađenje



anger disgust fear guilt happiness love pride sadness shame surprise

Corpus

Constructions

Ontology

Emotion

Cultureal  
conceptualization

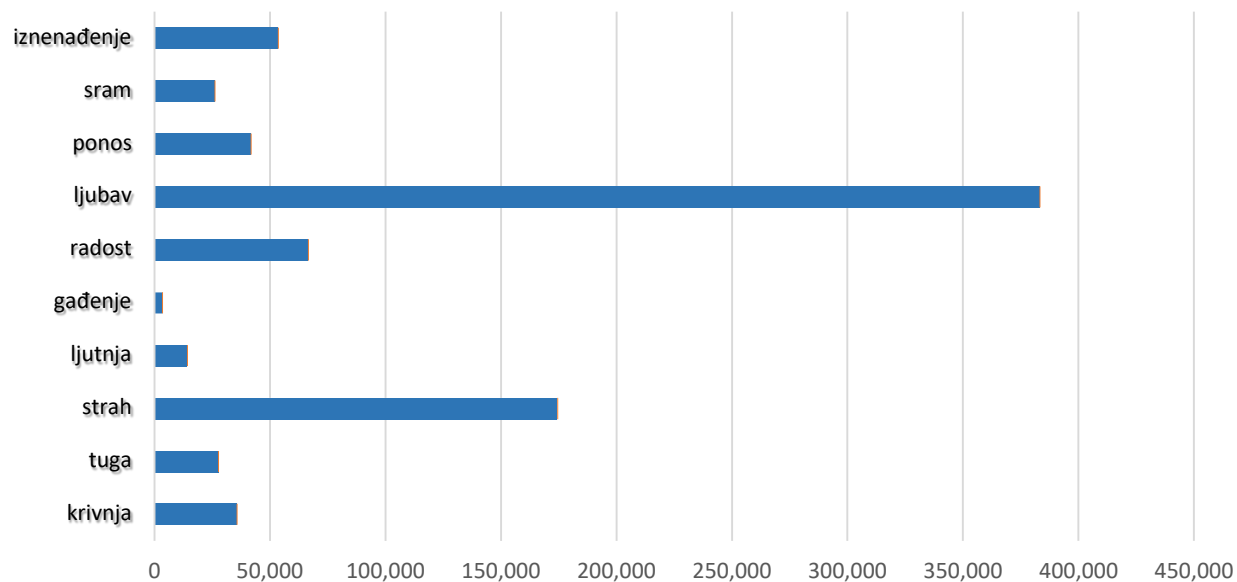
# Corpus

## Corpus based collocation analysis of the concepts

Croatian Web .hr domain Corpus **hrWaC14** (1,2 Gw)

.hr top-level domain (Ljubešić and Klubička 2014) -2011

hrWac14 (1,2 Gw)

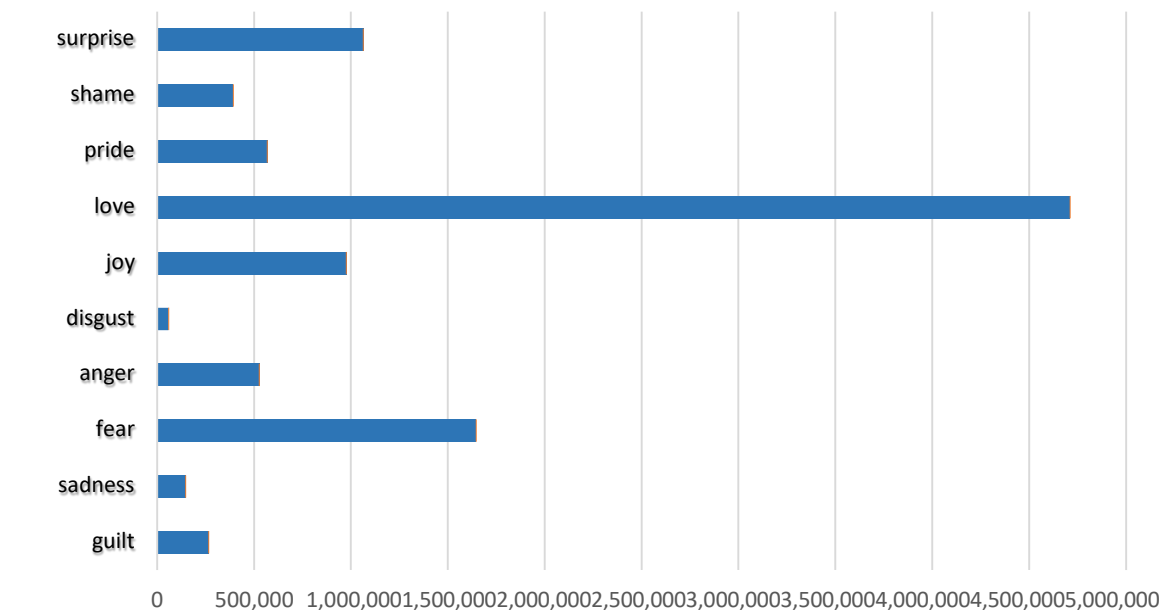


	krivnja	tuga	strah	ljutnja	gađenje	radost	ljubav	ponos	sram	iznenađenje
Raw Freq	35,556	27,705	174,445	14,129	3,502	66,424	383,226	41,721	26,118	53,644
Per million	25.32	19.72	124.22	10.06	2.49	47.3	272.9	29.71	18.59	38.2

English Corpus **enTenTen2013** (13 Gw)

Web corpus -2013

enTenTen (13 Gw)



	guilt	sadness	fear	anger	disgust	joy	love	pride	shame	surprise
Raw Freq	263,927	146,330	1,645,626	526,823	57,805	976,023	4,712,095	568,692	391,204	1,063,866
Per million	11.61	6.43	72.4	23.17	2.54	42.94	207.31	25.02	17.21	46.8

# Constructions

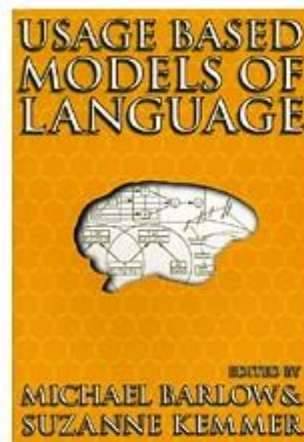
Collocation data [EMOTION<sub>NOUN TARGET</sub>+ CONCEPT] is classified according to 7 types of syntactic-semantic constructions.

Linguistic **constructions** represent **cognitive mechanisms** that **schematically profile conceptualizations** of the target concept.

Tomasello, Langacker 1987, 2008

You shall know a word by the company it keeps... Firth, 1957

## Usage Based Models of Language



EDITED BY MICHAEL BARLOW AND SUZANNE KEMMER

Distributed for Center for the Study of Language and Information

384 pages | 6 x 9 | © 2000

How do humans learn how to speak and understand language? For years, linguists have developed numerous models in attempts to explain humans' ability to communicate through language. Historically, these approaches were rooted and restricted in rule-based linguistic representations.

Only recently has... [Read More](#)

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Suzanne Kemmer and Michael Barlow

#### A Dynamic Usage-Based Model

## The usage-based theory of language acquisition

Michael Tomasello

### Usage-based and emergentist approaches to language acquisition

HEIKE BEHRE

#### 5.1 Introduction

The usage-based approach to linguistic communication may be summarized in the two aphorisms:

- meaning is use
- structure emerges from use

#### Abstract

*It was long considered to be impossible to learn grammar based on linguistic experience alone. In the past decade, however, advances in usage-based linguistic theory, computational linguistics, and developmental psychology changed the view on this matter. So-called usage-based and emergentist approaches to language acquisition state that language can be learned from language use itself, by means of social skills like joint attention, and means of powerful generalization mechanisms. This paper first summarizes the assumptions regarding the nature of linguistic representations and processing. Usage-based theories are nonmodular and nonreductionist, i.e. they emphasize the form-function relationships, and deal with all of language, not just selected levels of representations. Furthermore, storage a*

#### Usage-Based Theory

Joan L. Bybee and Clay Beckner

[The Oxford Handbook of Linguistic Analysis](#)

Edited by Bernd Heine and Heiko Narrog

Print Publication Date: Dec 2009 Subject: Linguistics, Morphology

Online Publication Date: Sep 2012 DOI: 10.1093/oxfordhb/9780199206855.013.0001

#### [-] Abstract and Keywords

Usage-based theory takes language to be an embodied phenomenon that is shaped by and shapes the context. This theoretical perspective incorporates the role of social structure. This chapter discusses the following: background and theoretical context; exemplars, networks, and constructions; the role of representations; and language as a complex adaptive system.

Keywords: [usage-based theory](#), [social human behaviour](#), [exemplars](#)

# Constructions

Collocation data [EMOTION<sub>NOUN TARGET</sub>+ CONCEPT] is classified according to 7 types of syntactic-semantic constructions.

Linguistic **constructions** represent **cognitive mechanisms** that **schematically profile conceptualizations** of the target concept.

1) [NT and/or N] *what are the conceptually related concepts?*

NT Lemma	Collocation	Gram_rel	Freq	Score	Example	Source
ljubav	briga	coord	798	5.68	brigu i ljubav (19%)	
strah	depresija	coord	117	4.19		
tuga	depresija	coord	109	5.82	tuge i depresije (6%)	
strah	frustracija	coord	102	4.11		
ljubav	istina	coord	790	5.19		
sram	krivnja	coord	116	5.95		
radost	mir	coord	1,014	07.07	mir i radost (6%)	
ljubav	mržnja	coord	893	6.09	ljubavi i mržnje (13%)	
ljubav	nada	coord	843	5.79	vjere , nade i ljubavi (9%)	
strah	nasilje	coord	96	3.54		
strah	panica	coord	95	4.12	u strahu i panici (7%)	
tuga	patnja	coord	116	5.98		
tuga	ponos	coord	104	5.62		
ljubav	razumijevanje	coord	703	5.69	ljubavi i razumijevanja (10%)	
radost	sloboda	coord	102	3.82		
krivnja	sram	coord	116	5.95		
ponos	sreće	coord	114	5.47	sreće i ponosa (19%)	

NT Lemma	Collocation	Gram_rel	Freq	Score	Example
love	peace	NT and-or	24,669	6.97	
love	life	NT and-or	22,299	5.06	
fear	anxiety	NT and-or	21,966	8.23	fear and anxiety (7%)
joy	peace	NT and-or	21,485	8.02	peace and joy (12%)
love	respect	NT and-or	18,915	6.66	love and respect (18%)
love	compassion	NT and-or	18,736	6.94	love and compassion (12%)
love	joy	NT and-or	17,679	6.67	love , joy (19%)
joy	love	NT and-or	17,679	6.67	love , joy (19%)
love	support	NT and-or	16,553	5.74	love and support (14%)
love	care	NT and-or	15,681	5.59	love and care (12%)
anger	frustration	NT and-or	15,535	9.2	anger and frustration (9%)
joy	happiness	NT and-or	15,410	8.37	joy and happiness (13%)
fear	anger	NT and-or	13,009	7.62	
anger	fear	NT and-or	13,009	7.62	
love	affection	NT and-or	12,883	6.43	love and affection (16%)
shame	guilt	NT and-or	12,380	9.27	guilt and shame (9%)
guilt	shame	NT and-or	12,380	9.27	guilt and shame (9%)
love	passion	NT and-or	12,100	6.1	love and passion (17%)
love	light	NT and-or	11,607	5.46	love and light (6%)



# Constructions

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Linguistic **constructions** represent **cognitive mechanisms** that **schematically profile conceptualizations** of the target concept.

2) [ADJ<sub>modifier</sub>+NT] *what are the salient **attributes** of the emotion?*

NT Lemma	Collocation	Gram_rel	Freq	Score	Example	Source
ljubav	kristov	a_modifier	<a href="#">487</a>	5.3	Kristova ljubav (7%)	
radost	kršćanski	a_modifier	<a href="#">133</a>	5.1	kršćanske radosti (9%)	
ljubav	kršćanski	a_modifier	<a href="#">909</a>	06.07	kršćanske ljubavi (10%)	
radost	ljetan	a_modifier	<a href="#">352</a>	6.21	u ljetnim radostima (7%)	
strah	ljudski	a_modifier	<a href="#">307</a>	4.46	ljudski strah (9%)	
ljubav	ljudski	a_modifier	<a href="#">395</a>	4.28	ljudske ljubavi (9%)	
iznenađenje	mal	a_modifier	<a href="#">188</a>	2.51	mala iznenađenja (13%)	
ljubav	međusoban	a_modifier	<a href="#">414</a>	4.99	međusobne ljubavi (10%)	
strah	mnogi	a_modifier	<a href="#">116</a>	2.45		
radost	mnogi	a_modifier	<a href="#">185</a>	3.37	na radost mnogih (16%)	
iznenađenje	mnogi	a_modifier	<a href="#">365</a>	4.38	, na iznenađenje mnogih (24%)	
iznenađenje	moguć	a_modifier	<a href="#">319</a>	4.94	moguća iznenađenja (8%)	
radost	morski	a_modifier	<a href="#">234</a>	5.94	u morskim radostima (10%)	
ponos	muški	a_modifier	<a href="#">116</a>	4.74	muški ponos (13%)	
ponos	nacionalan	a_modifier	<a href="#">1,776</a>	7.57	nacionalni ponos (9%)	
iznenađenje	najugodnije	a_modifier	<a href="#">743</a>	8.79	najugodnije iznenađenje (10%)	
radost	neizmjeran	a_modifier	<a href="#">159</a>	6.04	neizmjernu radost (6%)	

NT Lemma	Collocation	Gram_rel	Freq	Score	Example
love	true	<i>modifiers of NT</i>	<a href="#">51,532</a>	7.57	true love (16%)
joy	great	<i>modifiers of NT</i>	<a href="#">29,948</a>	5.7	great joy (10%)
love	unconditional	<i>modifiers of NT</i>	<a href="#">28,550</a>	7.61	unconditional love (19%)
pride	great	<i>modifiers of NT</i>	<a href="#">27,229</a>	5.59	take great pride in (10%)
love	much	<i>modifiers of NT</i>	<a href="#">23,655</a>	6.09	much love (21%)
love	great	<i>modifiers of NT</i>	<a href="#">23,600</a>	5.1	great love (20%)
love	first	<i>modifiers of NT</i>	<a href="#">23,265</a>	5.01	first love (19%)
love	real	<i>modifiers of NT</i>	<a href="#">12,749</a>	5.2	real love (12%)
love	deep	<i>modifiers of NT</i>	<a href="#">12,726</a>	5.86	a deep love (16%)
fear	great	<i>modifiers of NT</i>	<a href="#">11,504</a>	4.27	greatest fear (10%)
love	more	<i>modifiers of NT</i>	<a href="#">10,830</a>	3.37	more love (15%)
joy	much	<i>modifiers of NT</i>	<a href="#">9,893</a>	5.41	so much joy (8%)
fear	big	<i>modifiers of NT</i>	<a href="#">9,173</a>	4.81	biggest fear (18%)
joy	pure	<i>modifiers of NT</i>	<a href="#">8,916</a>	7.33	pure joy (18%)
love	new	<i>modifiers of NT</i>	<a href="#">8,823</a>	3.19	a new love (4%)
love	pure	<i>modifiers of NT</i>	<a href="#">8,472</a>	5.64	pure love (16%)
fear	bad	<i>modifiers of NT</i>	<a href="#">8,124</a>	5.05	worst fears (9%)

# Constructions

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Linguistic **constructions** represent **cognitive mechanisms** that **schematically profile conceptualizations** of the target concept.

3) [NT<sub>modifier</sub>+N|V] *what are the salient ENTITIES and EVENTS **modified** by the emotion?*

NT Lemma	Collocation	Gram_rel	Freq	Score	Example
strah	atmosfera	n_koga-čega	259	5.06	atmosfera straha (11%)
krivnja	dio	n_koga-čega	637	4.03	dio krivnje za (2%)
iznenađenje	gost	n_koga-čega	582	6.2	gost iznenađenja (12%)
krivnja	izjednačavanje	n_koga-čega	387	8.29	izjednačavanja krivnje (5%)
strah	osjećaj	n_koga-čega	661	5.92	osjećaj straha (17%)
krivnja	osjećaj	n_koga-čega	2,901	8.76	osjećaj krivnje (10%)
ponos	parada	n_koga-čega	979	9.14	Parade ponosa (7%)
ponos	povorka	n_koga-čega	1,119	9.36	Povorke ponosa (5%)
krivnja	priznanje	n_koga-čega	404	6.79	priznanje krivnje (21%)
sram	stup	n_koga-čega	1,047	09.06	na stup srama (15%)

NT Lemma	Collocation	Gram_rel	Freq	Score	Example
anger	management	nouns and verbs modified by	8,509	5.67	anger management (20%)
pride	parade	nouns and verbs modified by	5,950	7.82	Pride Parade (13%)
fear	factor	nouns and verbs modified by	4,855	5.16	the fear factor (5%)
anger	issue	nouns and verbs modified by	4,294	4.06	anger issues (18%)
guilt	trip	nouns and verbs modified by	4,067	5.49	a guilt trip (6%)
joy	division	nouns and verbs modified by	3,153	5.47	Joy Division , (7%)
fear	mongering	nouns and verbs modified by	2,974	5.88	fear mongering (20%)
joy	ride	nouns and verbs modified by	2,596	5.33	a joy ride (11%)
pride	event	nouns and verbs modified by	2,100	2.97	Pride events (8%)
pride	festival	nouns and verbs modified by	1,796	4.81	Pride Festival (9%)
fear	response	nouns and verbs modified by	1,558	3.47	fear response (21%)
fear	god	nouns and verbs modified by	1,468	2.28	Fear God (16%)
guilt	feeling	nouns and verbs modified by	1,288	4.06	guilt feelings (11%)
fear	tactic	nouns and verbs modified by	1,272	4.28	fear tactics (11%)
pride	march	nouns and verbs modified by	1,185	3.71	Pride March (11%)
pride	month	nouns and verbs modified by	1,116	1.92	Pride Month (16%)
fear	itself	nouns and verbs modified by	1,108	4.45	Fear Itself (14%)



## Constructions

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Linguistic **constructions** represent **cognitive mechanisms** that **schematically profile conceptualizations** of the target concept.

4) [NT<sub>Figure</sub>+Preposition] 5) [Preposition+NT<sub>Ground</sub>] *what are the spatial/logical/causal relations?*

NT Lemma	Collocation	Gram_rel	Freq	Score	Example
ljubav	o	prec_prep	<a href="#">8,965</a>	5.78	o ljubavi (22%)
strah	od	prec_prep	<a href="#">7,808</a>	4.88	od straha (12%)
radost	od	prec_prep	<a href="#">1,369</a>	2.39	od radosti (17%)
ljutnja	od	prec_prep	<a href="#">272</a>	0.06	od ljutnje (18%)
ljubav	od	prec_prep	<a href="#">3,146</a>	3.53	od ljubavi (14%)
ponos	od	prec_prep	<a href="#">413</a>	0.66	od ponosa (13%)
tuga	od	prec_prep	<a href="#">1,818</a>	2.8	od tuge (16%)
sram	od	prec_prep	<a href="#">1,198</a>	2.2	od srama (13%)
iznenađenje	od	prec_prep	<a href="#">429</a>	0.71	od iznenađenja (15%)
strah	osim	prec_prep	<a href="#">107</a>	2.06	osim straha (20%)
ljubav	osim	prec_prep	<a href="#">339</a>	3.4	osim ljubavi (16%)
ljubav	po	prec_prep	<a href="#">495</a>	2.4	po ljubavi (15%)
strah	poput	prec_prep	<a href="#">131</a>	2.85	poput straha , (6%)
ljubav	poput	prec_prep	<a href="#">258</a>	3.4	poput ljubavi , (8%)
strah	protiv	prec_prep	<a href="#">139</a>	2.34	protiv straha (13%)

NT Lemma	Collocation	Gram_rel	Freq	Score	Example
fear	%w" of ...	prepositional phrases	<a href="#">250,463</a>	0.15	
fear	... of "%w"	prepositional phrases	<a href="#">112,455</a>	0.07	
joy	... of "%w"	prepositional phrases	<a href="#">101,389</a>	0.1	
joy	"%w" of ...	prepositional phrases	<a href="#">75,442</a>	0.08	
pride	... of "%w"	prepositional phrases	<a href="#">66,729</a>	0.12	
pride	"%w" in ...	prepositional phrases	<a href="#">60,194</a>	0.11	
anger	... of "%w"	prepositional phrases	<a href="#">49,233</a>	0.09	
fear	... in "%w"	prepositional phrases	<a href="#">48,242</a>	0.03	
guilt	... of "%w"	prepositional phrases	<a href="#">46,395</a>	0.18	
surprise	"%w" by ...	prepositional phrases	<a href="#">44,732</a>	0.04	
fear	... for "%w"	prepositional phrases	<a href="#">42,973</a>	0.03	
joy	... with "%w"	prepositional phrases	<a href="#">41,015</a>	0.04	
fear	... with "%w"	prepositional phrases	<a href="#">39,965</a>	0.02	
joy	"%w" in ...	prepositional phrases	<a href="#">30,500</a>	0.03	
pride	"%w" of ...	prepositional phrases	<a href="#">28,811</a>	0.05	
fear	... without "%w"	prepositional phrases	<a href="#">28,810</a>	0.02	
shame	... of "%w"	prepositional phrases	<a href="#">28,521</a>	0.07	
love	"%w" by ...	prepositional phrases	<a href="#">28,350</a>	0	
pride	... with "%w"	prepositional phrases	<a href="#">28,341</a>	0.05	

# Constructions

Collocation data [EMOTION<sub>NOUN</sub> TARGET+ CONCEPT] is classified according to 7 types of syntactic-semantic constructions.

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6) [Verb+NT<sub>object</sub>] *what processes can you (conceptually) do with the emotion?*

NT Lemma	Collocation	Gram_rel	Freq	Score	Example
radost	imati	is_obj4	<a href="#">321</a>	1.06	Večeras imamo radost i čast da ste
ljubav	imati	is_obj4	<a href="#">916</a>	2.49	Sretni smo sve dok imamo ljubav
ponos	imati	is_obj4	<a href="#">322</a>	1.07	Hrvati imaju ponos karakterističan
ljubav	iskazati	is_obj4	<a href="#">274</a>	4.45	iskazati ljubav (8%)
ljubav	iskazivati	is_obj4	<a href="#">410</a>	5.07	Kad netko nekome iskazuje ljubav
strah	izazivati	is_obj4	<a href="#">430</a>	5.95	izazivaju strah (10%)
strah	izazvati	is_obj4	<a href="#">239</a>	4.88	izazvati strah
ljubav	moći	is_obj4	<a href="#">330</a>	0.95	ljubav može (10%)
ljubav	naći	is_obj4	<a href="#">369</a>	3.88	naći ljubav (5%)
strah	osjećati	is_obj4	<a href="#">590</a>	5.56	osjecati strah
krivnja	osjećati	is_obj4	<a href="#">609</a>	6.21	osjećati krivnju
ljubav	osjećati	is_obj4	<a href="#">479</a>	4.67	osjećati ljubav
radost	osjetiti	is_obj4	<a href="#">369</a>	6.18	osjetiti radost
ljubav	osjetiti	is_obj4	<a href="#">406</a>	4.78	osjetiti ljubav (5%)
ljubav	postojati	is_obj4	<a href="#">330</a>	3.19	postoji ljubav (18%)
krivnja	priznati	is_obj4	<a href="#">1,504</a>	7.98	priznao krivnju (19%)
ljubav	voditi	is_obj4	<a href="#">3,945</a>	7.26	voditi ljubav (3%)

NT Lemma	Collocation	Gram_rel	Freq	Score	Example
shame	be	verbs with as object	<a href="#">105,687</a>	2.18	's a shame (17%)
pride	take	verbs with as object	<a href="#">90,212</a>	6.39	take pride in (7%)
fear	be	verbs with as object	<a href="#">74,289</a>	1.67	
joy	be	verbs with as object	<a href="#">73,099</a>	1.65	
fear	have	verbs with as object	<a href="#">49,774</a>	2.9	
joy	bring	verbs with as object	<a href="#">22,430</a>	6.21	bring joy (13%)
fear	overcome	verbs with as object	<a href="#">20,516</a>	8.15	
pride	be	verbs with as object	<a href="#">18,835</a>	-0.31	
joy	find	verbs with as object	<a href="#">14,894</a>	4.26	find joy (19%)
anger	be	verbs with as object	<a href="#">12,881</a>	-0.85	
joy	experience	verbs with as object	<a href="#">12,743</a>	6.71	experience the joy (22%)
joy	have	verbs with as object	<a href="#">12,355</a>	0.9	
fear	face	verbs with as object	<a href="#">11,353</a>	6.26	
pride	have	verbs with as object	<a href="#">10,026</a>	0.6	
fear	feel	verbs with as object	<a href="#">9,990</a>	4.54	feel fear (6%)
joy	share	verbs with as object	<a href="#">9,298</a>	5.9	
anger	express	verbs with as object	<a href="#">8,285</a>	7.05	
guilt	feel	verbs with as object	<a href="#">7,967</a>	4.36	feel guilt (6%)
joy	feel	verbs with as object	<a href="#">7,893</a>	4.27	
guilt	be	verbs with as object	<a href="#">6,870</a>	-1.76	
shame	take	verbs with as object	<a href="#">6,753</a>	2.62	take shame in (5%)

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Collocation data [EMOTION<sub>NOUN</sub> TARGET+ CONCEPT] is classified according to 7 types of syntactic-semantic constructions.

Linguistic **constructions** represent **cognitive mechanisms** that **schematically profile conceptualizations** of the target concept.

7) [NT<sub>subject</sub>+Verb] *what processes (can you conceptualize) an emotion can **do**?*

NT Lemma	Collocation	Gram_rel	Freq	Score	Example
strah	boliti	gl_post	374	5.61	Jer , ako kasniš samo pet minuta srce mi je u dlanu i moja m
ljubav	boliti	gl_post	476	5.08	Ljubav boli a kad shvatiš da boli onda patiš jer si shvatio da p
strah	činiti	gl_post	302	3.69	strah čini tada ono što ljubav i velikodušnost ne mogu sada
ljubav	činiti	gl_post	1,372	5.53	Ljubav čini da prolazi vrijeme
ljubav	dati	gl_post	1,370	5.22	kuća mala meni je zrnca ... ljubav dala zrnca mala vrijednija o
radost	davati	gl_post	137	3.47	Radost nam daje krila
ljubav	davati	gl_post	1,490	6.08	Kad je prava , ljubav daje krila , a kad nije prava ona ih potkre
strah	dobiti	gl_post	352	3.34	i da su moji strahovi dobili zamah zbog nevjere
radost	doći	gl_post	173	2.52	Kad dođe radost , budi oprezan
ljubav	doći	gl_post	824	4.37	Nerealno se nadam da će ljubav doći odjednom
strah	dolaziti	gl_post	350	4.22	Strah dolazi , kao i sve prvobitno , iz sna i iz sanjanja
radost	dolaziti	gl_post	244	3.98	Radost dolazi iz zajedništva , vjere , ljubavi , smisla
ljubav	dolaziti	gl_post	722	4.84	Ljubav dolazi iz vječnosti i odlazi u vječnost
strah	govoriti	gl_post	376	3.76	Strah je govorio njegovom razumu da se okrene i vrati natrag
ljubav	govoriti	gl_post	971	4.83	Kad ljubav govori , razum šuti
ponos	govoriti	gl_post	253	3.41	ponos nam govori drugačije
ljubav	ići	gl_post	786	4.73	Ljubav ide kroz želudac
ponos	igrati	gl_post	81	2.37	ponos igra veliku ulogu u boksu
strah	imati	gl_post	1,849	3.56	Strah ima tisuću lica i naša je temeljna samoća jer nam uskra

NT Lemma	Collocation	Gram_rel	Freq	Score	Example
fear	have	verbs with as subject	10,961	0.72	fear has (6%)
shame	be	verbs with as subject	8,526	-1.45	shame is (10%)
fear	come	verbs with as subject	4,175	2.33	fear comes (9%)
joy	have	verbs with as subject	4,023	-0.72	Joy has (8%)
anger	have	verbs with as subject	3,891	-0.77	anger has (9%)
pride	have	verbs with as subject	3,313	-1	pride has (8%)
fear	do	verbs with as subject	3,034	-0.04	fear does (11%)
joy	come	verbs with as subject	2,969	1.87	joy comes (22%)
fear	drive	verbs with as subject	2,723	4.04	driven by fear (8%)
fear	make	verbs with as subject	1,982	0.3	fear makes (9%)
fear	go	verbs with as subject	1,839	0.61	
fear	become	verbs with as subject	1,732	1.93	fear becomes (4%)
fear	cause	verbs with as subject	1,549	2.89	
fear	get	verbs with as subject	1,538	0.01	
joy	do	verbs with as subject	1,477	-1.07	
fear	take	verbs with as subject	1,470	0.4	
fear	paralyze	verbs with as subject	1,448	4.8	paralyzed by fear (13%)
fear	keep	verbs with as subject	1,428	1.68	
fear	grow	verbs with as subject	1,378	2.47	
fear	motivate	verbs with as subject	1,371	4.36	motivated by fear (11%)
fear	grip	verbs with as subject	1,330	4.64	
fear	hold	verbs with as subject	1,267	2.15	

## Constructions

Collocation data [EMOTION<sub>NOUN TARGET</sub>+ CONCEPT] is classified according to 7 types of syntactic-semantic constructions.

Linguistic **constructions** represent **cognitive mechanisms** that **schematically profile conceptualizations** of the target concept.

- 1) [NT and/or N] *what are the conceptually related concepts?*
- 2) [ADJ<sub>modifier</sub>+NT] *what are the salient **attributes** of the emotion?*
- 3) [NT<sub>modifier</sub>+N|V] *what are the salient ENTITIES and EVENTS **modified** by the emotion?*
- 4) [NT<sub>Figure</sub>+Preposition] 5) [Preposition+NT<sub>Ground</sub>] *what are the **spatial/logical/causal relations**?*
- 6) [Verb+NT<sub>object</sub>] *what processes can you (conceptually) **do with** the emotion?*
- 7) [NT<sub>Subject</sub>+Verb] *what processes (can you conceptualize) an emotion can **do**?*

These represent **emergent conceptualization layers** of the target emotional lexical concept(s).



# Constructions

The scope: For each lexeme and construction a **collocation list** has been created with 50 most frequent lexical collocates using SketchEngine.

**anger** (noun) Alternative PoS: [verb](#) (55,197)  
English Web 2013 (enTenTen13) freq = [526,823](#) (23.17 per million) Coverage: [85.02%](#)

<a href="#">modifiers of "anger"</a>	<a href="#">nouns and verbs modified by "anger"</a>	<a href="#">verbs with "anger" as object</a>	<a href="#">verbs with "anger" as subject</a>	<a href="#">prepositional phrases</a>
98.722 0.19		125.098 0.24		144.388

**love** (noun) English Web 2013 (enTenTen13) freq = [4,712,095](#) (207.31 per million)

<a href="#">modifiers of "love"</a>	<a href="#">nouns and verbs modified by "love"</a>	<a href="#">verbs with "love" as object</a>	<a href="#">verbs with "love" as subject</a>	<a href="#">"love" and/or ...</a>
<a href="#">1,023,820</a> 0.22	<a href="#">840,816</a> 0.18	<a href="#">886,423</a> 0.19	<a href="#">439,463</a> 0.09	<a href="#">944,880</a> 0.20
<b>unconditional +</b> <a href="#">28,550</a> 9.75	<b>affair +</b> <a href="#">38,779</a> 9.91	<b>express +</b> <a href="#">17,959</a> 8.31	<b>handle +</b> <a href="#">4,185</a> 7.49	<b>peace +</b> <a href="#">24,669</a> 9.17
unconditional love	love affair with	<b>share +</b> <a href="#">29,704</a> 8.09	love handles	<b>compassion +</b> <a href="#">18,736</a> 9.12
<b>i +</b> <a href="#">68,961</a> 9.67	<b>story +</b> <a href="#">47,877</a> 9.12	<b>feel +</b> <a href="#">19,634</a> 7.60	<b>spell +</b> <a href="#">2,045</a> 7.15	love and compassion
I LOVE	love story	<b>show +</b> <a href="#">29,178</a> 7.56	true love spells	<b>respect +</b> <a href="#">18,915</a> 8.98
<b>true +</b> <a href="#">51,532</a> 9.20	<b>triangle +</b> <a href="#">10,165</a> 8.49	<b>spread +</b> <a href="#">7,804</a> 7.41	<b>love +</b> <a href="#">5,659</a> 6.93	love and respect
true love	a love triangle	spread the love	I love love love	<b>joy +</b> <a href="#">17,679</a> 8.87
<b>divine +</b> <a href="#">6,964</a> 7.56	<b>song +</b> <a href="#">22,229</a> 8.39	<b>profess +</b> <a href="#">3,545</a> 6.98	<b>conquer +</b> <a href="#">1,659</a> 6.85	love , joy
of Divine Love	love song	<b>find +</b> <a href="#">37,214</a> 6.60	love conquers all	<b>affection +</b> <a href="#">12,883</a> 8.71
<b>pure +</b> <a href="#">8,472</a> 7.42	<b>letter +</b> <a href="#">18,983</a> 8.26	find love	<b>motivate +</b> <a href="#">1,788</a> 6.81	love and affection
pure love	love letter	<b>demonstrate +</b> <a href="#">4,870</a> 6.60	motivated by love	<b>friendship +</b> <a href="#">11,032</a> 8.38
<b>romantic +</b> <a href="#">7,180</a> 7.41	<b>poem +</b> <a href="#">8,514</a> 7.92	<b>declare +</b> <a href="#">3,635</a> 6.55	<b>inspire +</b> <a href="#">1,929</a> 6.21	love and friendship
romantic love	love poem	<b>celebrate +</b> <a href="#">4,831</a> 6.53	<b>endure +</b> <a href="#">903</a> 5.87	<b>passion +</b> <a href="#">12,100</a> 8.30



## Constructions

Visualizing constructions as a CONCEPTUAL NETWORK

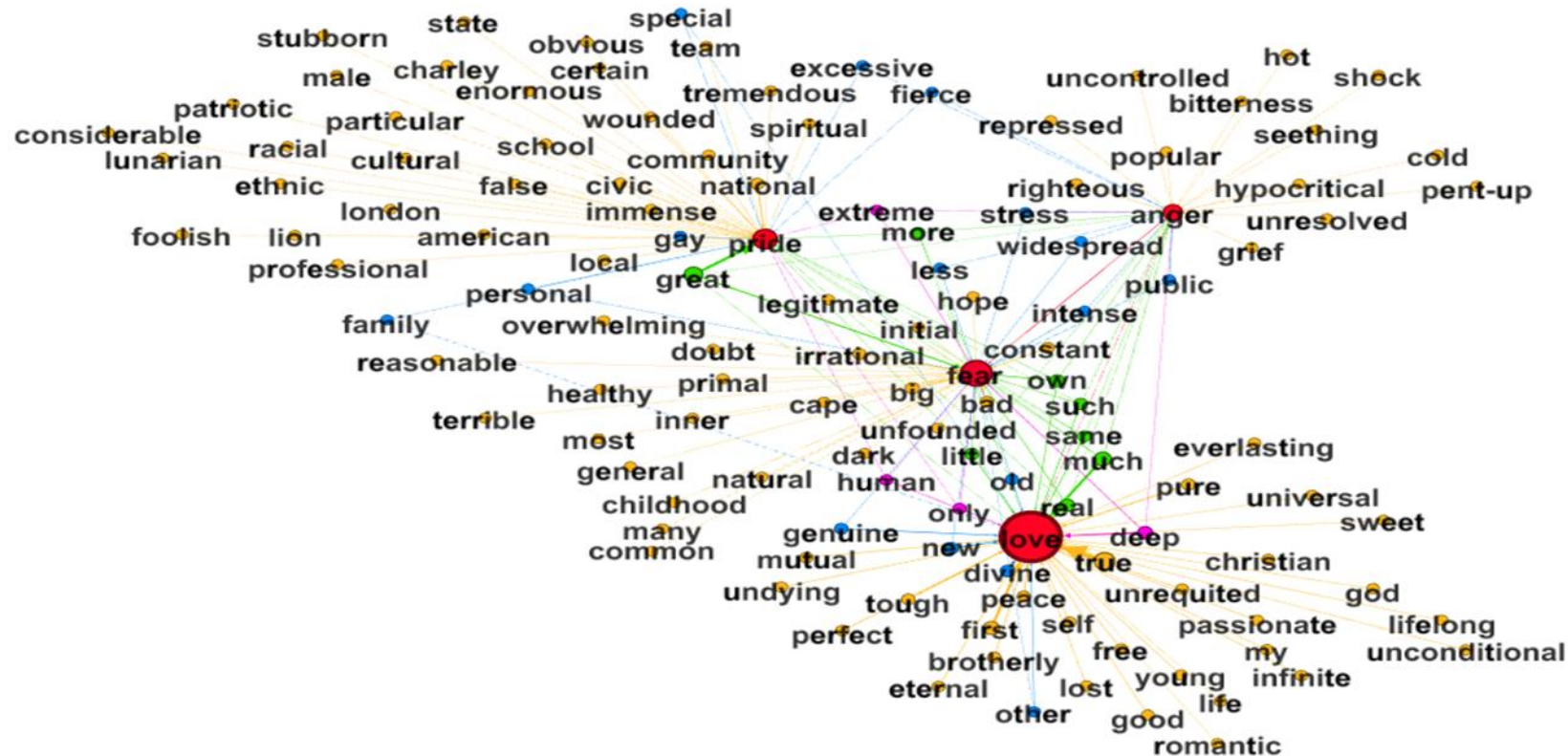




## Constructions

Force layout graph representation of the 50 most frequent [ADJ<sup>modifier</sup>+NT] relations in the hrWac corpus.

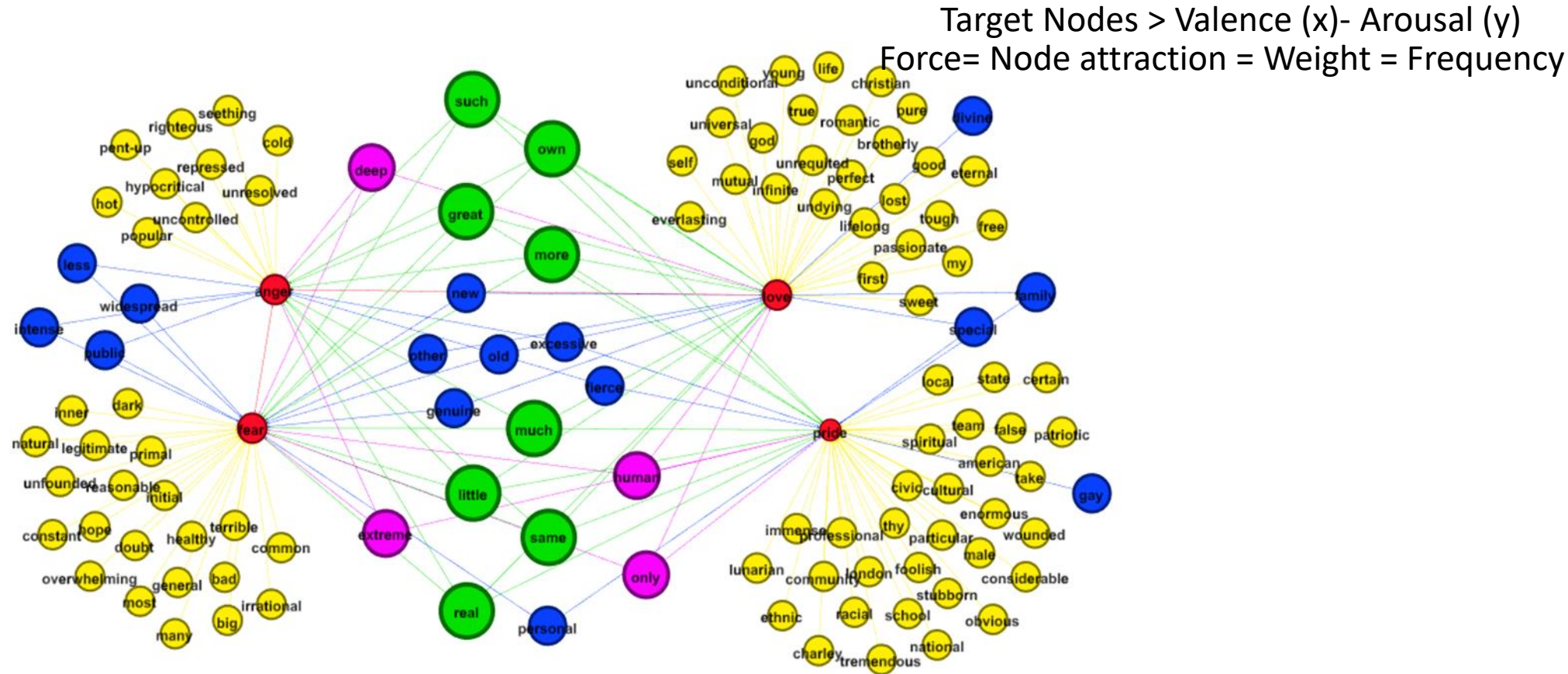
Force= Node attraction = Weight = Frequency



The adjectives are source nodes and the lexicalized emotions: **ljubav** 'love', **ponos** 'pride', **ljutnja** 'anger', **strah** 'fear' are target nodes.

## Constructions

Valence and arousal modified Force layout graph representation of the 50 most frequent **[ADJ<sup>modifier</sup>+NT]** relations in the enTenTen corpus.



The modifier lexemes are the source nodes. The target lexemes are settled in the 2-D space according to their hedonic valence and arousal.



## Ontology

From data information to knowledge: The collocation data is **modelled** according to the **ontological hierarchy of lexical concepts and constructions**.

- Lexical concepts represent **complex system** of the embodied perceived categories and REFERENCE
  - a) Material
  - b) Psychological
  - c) Social
- Entities, Properties, Processes
- Categories have characteristics of multiple interrelated components that create **networks**.
- Networks can become **new objects** that in recurrent fashion create self organizing networks of higher order, with **emergent hierarchy of properties** and 'dynamic stability'.
- The conceptual structure of lexical items in OMLCC is thus organized as an **hierarchical system** starting with **the more basic things** giving rise to **the more complex, emergent *entities, properties, relations and processes***.



# Ontology

SuperClass	Class	Emergent Class Property
EXISTENCE	01.Existence	A (Entity) exists
MATERIAL	02.Emergence	A (Form) becomes B (Transformation)
	03.Mat_Structure	A (Part) 1...n isPartOf B (Whole), B (Whole) hasParts A1...n (Part)
	04.Spatial	A(Figure) is_in_spatial_relation_to B(Ground)
	05.Force	A (ForceStructure) influences(by_mechanical/liquid/thermodynamic_force) B (Patient)
	06.MotionAction	A (Mover/Actor has Force) moves /acts (on) B (Path/Patient 03-04 ) with (Vehicle/Instrument 03)
	07.SequenceTime	A (TimeEntity) has sequence (3-5)
	08.Animacy	A (Animate) is_self-sustaining structure, organism that reacts to environment
PSYCHOLOGICAL	09.Perception	A (Perceiver 8-11) perceives 9 (with_instrument_of_perception 8) B(object of perception 1-8)
	10.Affect	A (Experiencer 8-14) experiences (with_organs_of_affect_experience 8) B(experience/quality/emotion 10)
	11.Cognition	A (Cogitor 8-14) remembers, reasons, thinks 11 B (Mental_Representation 11)
SOCIAL AND CULTURAL	12.SocIdentity	A (Person 8-14) identifies as B(Social Identity 12)
	13.SocBehaviour	A (Agent 8-14) behaves , performs B (social_action/ritual 13) with (instruments_of_behaviour 1-8)
	14.SocCommunication	A (Communicator 8-14) communicates with B (Reciever 8-14) about C (theme 1-14) on D (code)
	15.SocCultural	A (Model) is a set of values connected with experience, rituals, narration, philosophy, etical stance, institution, material things, actors

Corpus

+

Constructions

+

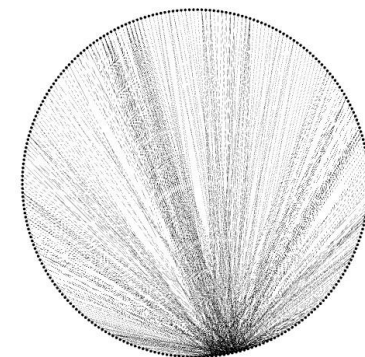
Ontology

Classification of lexical concepts

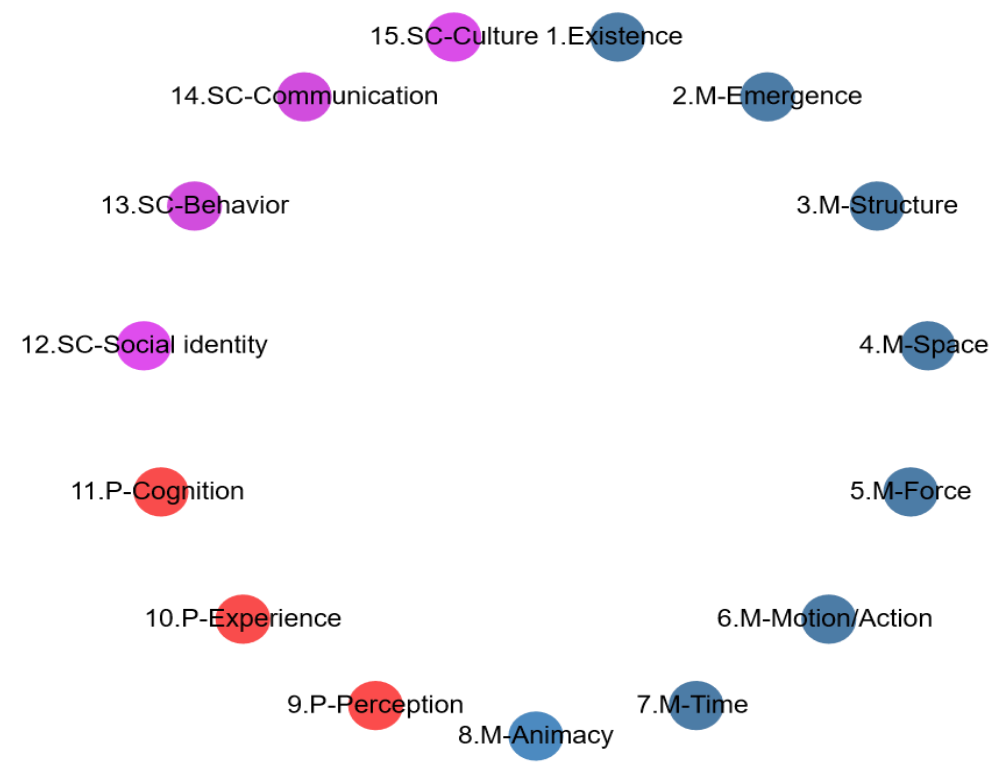
Id	Label
izaći	06.MotionAction.Go Out{MOVER goes out from CONTAINER}
izazivati	08.Animate.Cause.{CAUSER causes in a sequence EVENT}
izazvati	08.Animate.Cause.{CAUSER causes in a sequence EVENT}
izbaciti	06.MotionAction.Throw Out{ACTOR throws OBJECT} ISpartOf 13.SocBehaviour{AGENT throws out OBJECT with INSTRUMENT}
izbjeći	06.MotionAction.Evade
izbrisati	13.SocBehaviour.Erase
izgledati	03.Mat_Structure.Shape ISpartOf 09.Perception.See
izgubiti	03.Mat_Structure.Loose{OBJECT.POSSESSOR looses OBJECT.PART}
izjaviti	14.SocCommunication.Speak/Express{AGENT.SPEAKER speaks/express REPRESENTATION.MESSAGE with VOICE/EXPRESSION}
izjednačavati	11.Cognition.Categorization.Equalize
izjednačiti	11.Cognition.Categorization.Equalize
iznenađenje	10.Affect.Emotion
izražavati	14.SocCommunication.Speak/Express{AGENT.SPEAKER speaks/express REPRESENTATION.MESSAGE with VOICE/EXPRESSION}
izraziti	14.SocCommunication.Speak/Express{AGENT.SPEAKER speaks/express REPRESENTATION.MESSAGE with VOICE/EXPRESSION}
javlјati	14.SocCommunication.Speak/Express{AGENT.SPEAKER speaks/express REPRESENTATION.MESSAGE with VOICE/EXPRESSION}
kanalizirati	06.MotionAction.Canalize
kazati	14.SocCommunication.Speak/Express{AGENT.SPEAKER speaks/express REPRESENTATION.MESSAGE with VOICE/EXPRESSION}
kontrolirajte	11.Cognition.Control ISpartOf 13.SocBehaviour.Control
kontrolirati	11.Cognition.Control ISpartOf 13.SocBehaviour.Control
kriti	13.SocBehaviour.Hide{AGENT hides OBJECT}
krivnja	10.Affect.Emotion
ležati	06.MotionAction.Lie{MOVER lies on OBJECT}
liječiti	13.SocBehaviour.Heal

The first step in the process of construction of the emotional OMLCC is to **classify collocated entities, properties and processes** (lexical concepts found in the corpora and constructions) **according to their prototypical ontological status.**

graph





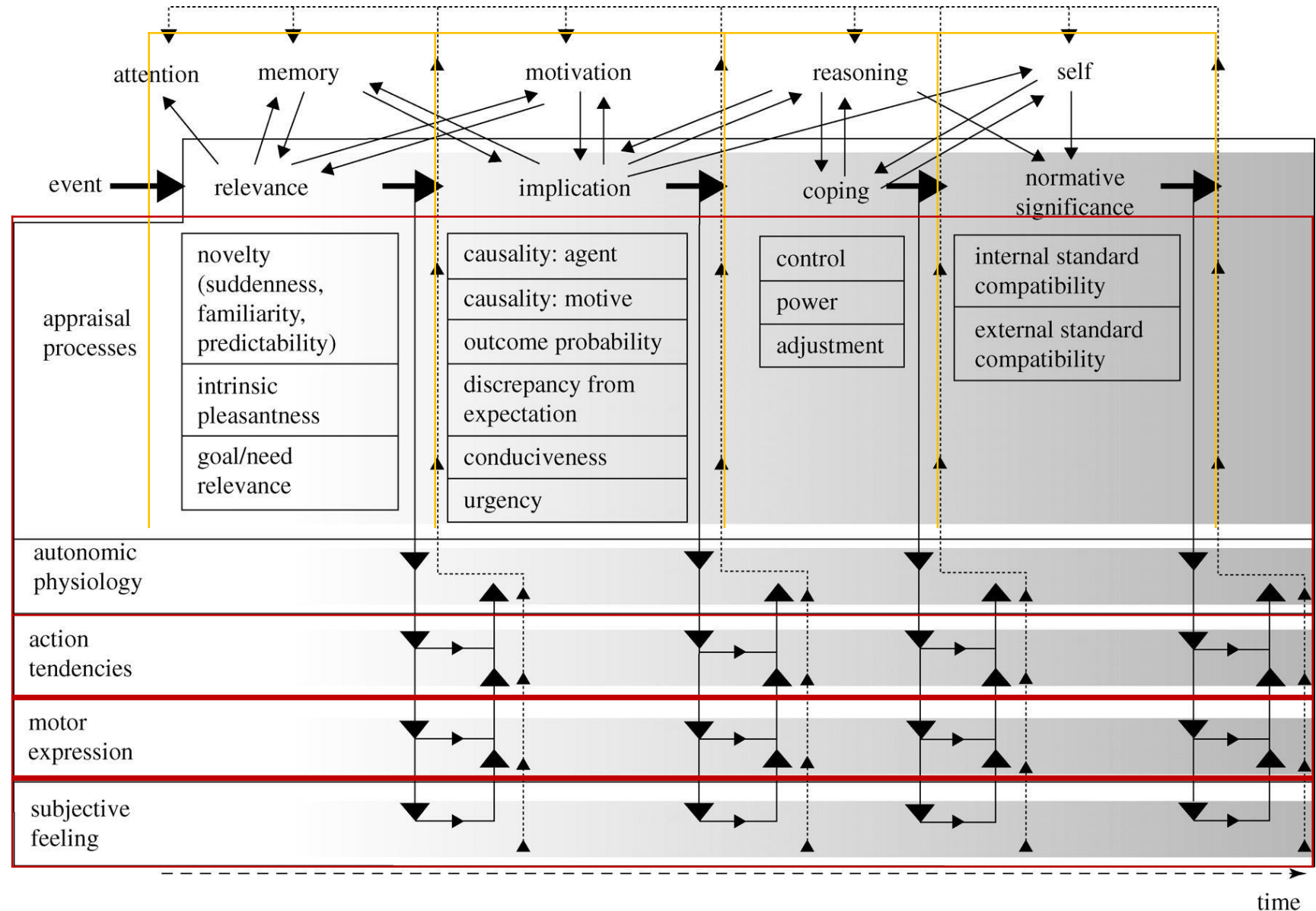




## Ontology Emotion

# Appraisal theory and components of the emotion process

- Emotion is an emergent and bio-psycho-cultural adaptation mechanism which allows each individual to react flexibly and dynamically to environmental contingencies.
- Componential structure

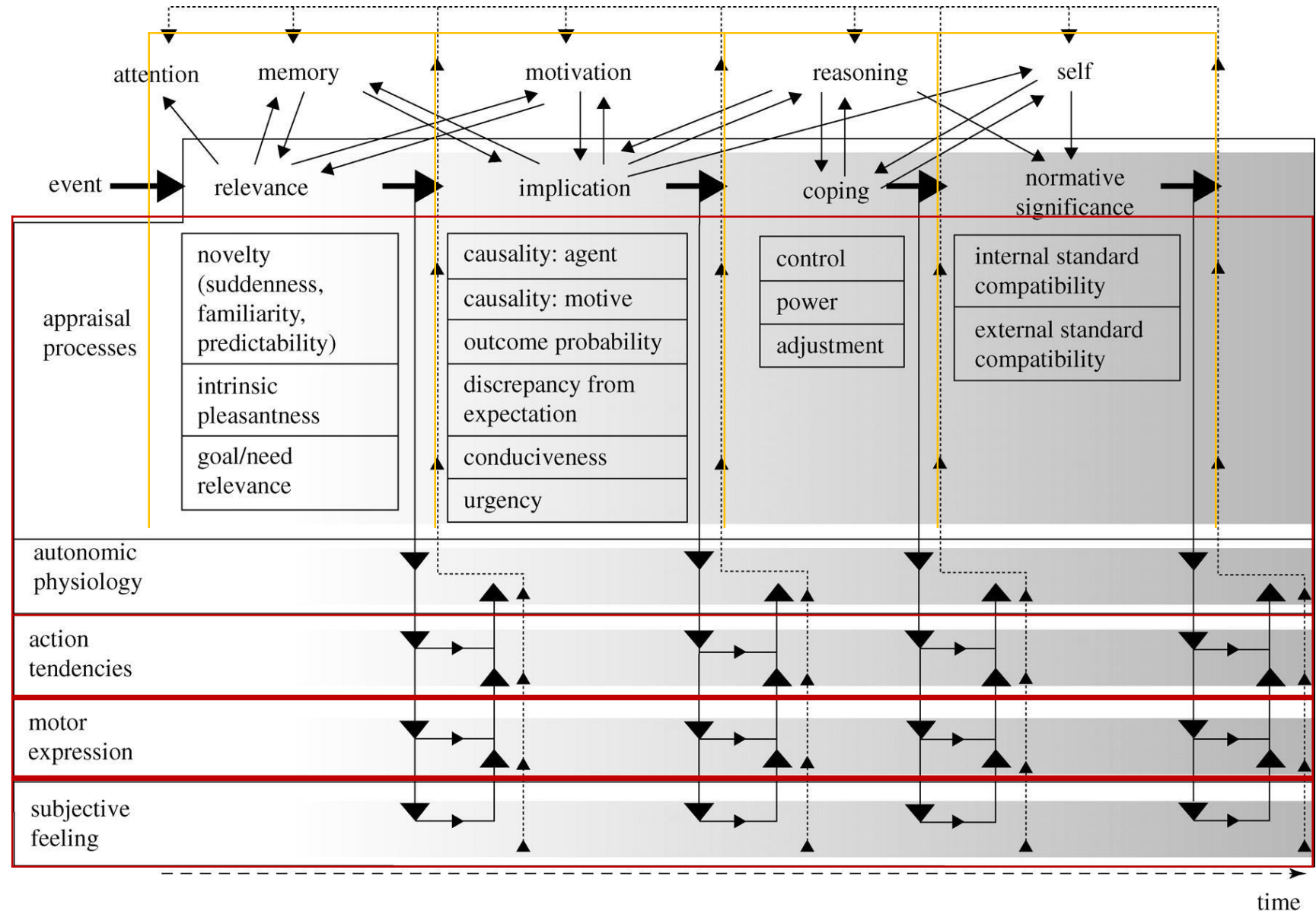


# Ontology Emotion

## Appraisal theory and components of the emotion process

### Appraisal objectives

- **(i) how relevant is this event for me?** Does it directly affect me or my social reference group? (relevance);
- **(ii) what are the implications or consequences of this event** and how do they affect my well-being and my immediate or longterm goals? (implications);
- **(iii) how well can I cope with or adjust to these consequences?** (coping potential);
- **and (iv) what is the significance of this event for my self-concept and for social norms and values?**(normative significance).



# Protégé Ontology: MFOEM

MFOEM (http://purl.obolibrary.org/obo/MFOEM.owl) : [C:\Users\Katarina\Downloads\MFOEM.owl]

File Edit View Reasoner Tools Refactor Window Help

MFOEM (http://purl.obolibrary.org/obo/MFOEM.owl) Search...

Active Ontology x Entities x Classes x Object Properties x Data Properties x Individuals by class x OWLViz x DL Query x

Class hierarchy Class hierarchy (inferred)

Class hierarchy: 'spatial region'

Annotations Usage

Annotations: 'spatial region'

Annotations +

label [language: en]  
spatial region

isDefinedBy  
<http://purl.obolibrary.org/obo/bfo.owl>

'BFO CLIF specification label'  
SpatialRegion

Description: 'spatial region'

Equivalent To +

SubClass Of +  
'immaterial entity'

General class axioms +

SubClass Of (Anonymous Ancestor)

Instances +

Target for Key +

Disjoint With +  
site  
'continuant fiat boundary'

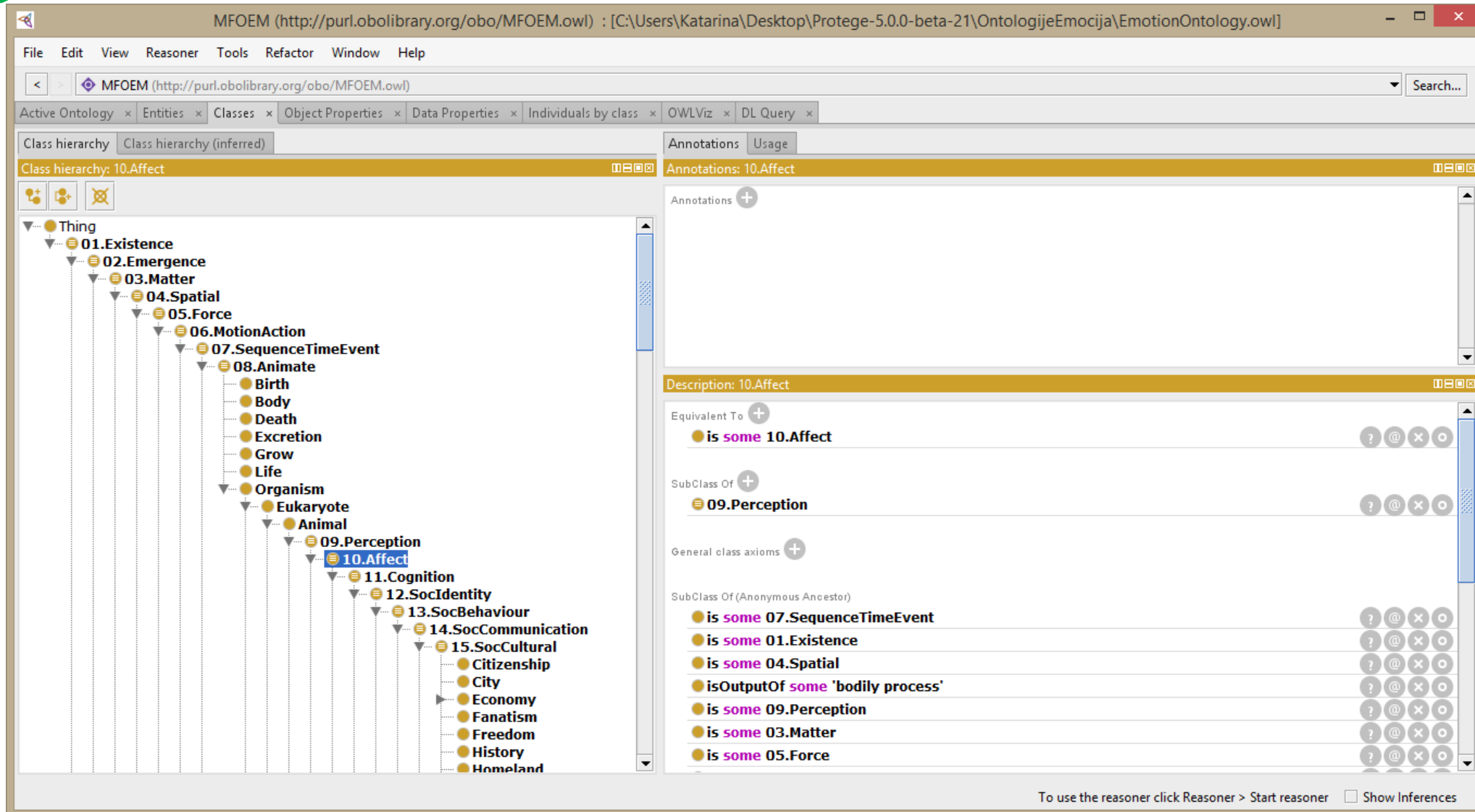
Class hierarchy: 'spatial region'

Thing  
entity  
continuant  
'generically dependent continuant'  
'information content entity'  
'data item'  
'data about an ontology part'  
curation status specification  
DbXref  
Definition  
'denotator type'  
'obsolescence reason specification'  
Subset  
Synonym  
SynonymType  
'independent continuant'  
'immaterial entity'  
'continuant fiat boundary'  
'one-dimensional continuant fiat boundary'  
'two-dimensional continuant fiat boundary'  
'zero-dimensional continuant fiat boundary'  
site  
'spatial region'  
'one-dimensional spatial region'  
'three-dimensional spatial region'  
'two-dimensional spatial region'  
'zero-dimensional spatial region'  
'material entity'  
'extended organism'  
'human being'  
'fiat object part'  
object

To use the reasoner click Reasoner > Start reasoner ☐ Show Inferences

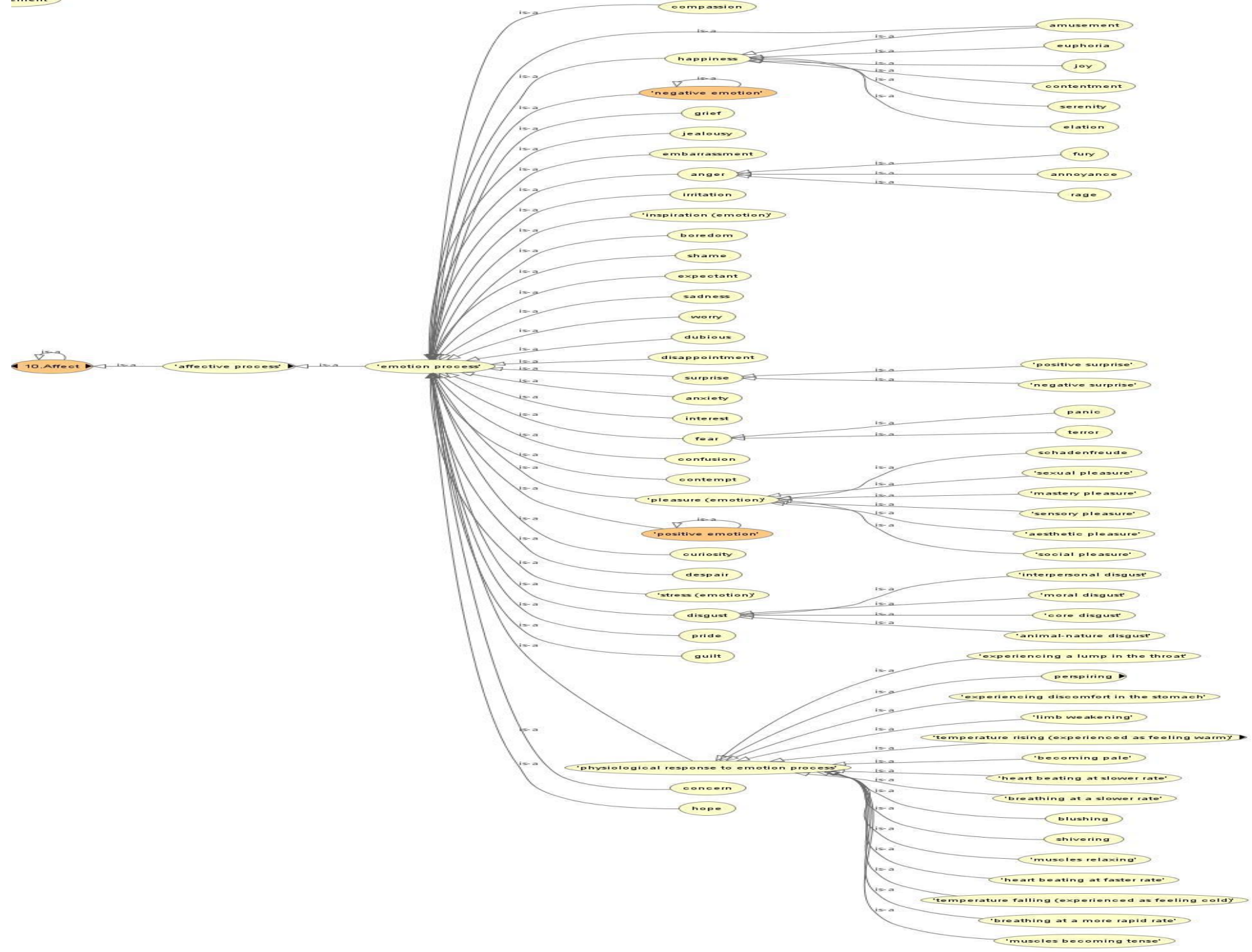
# Protégé Ontology: Class Ontology

More complex conceptual structures **emerge** from cognitive networks of conceptually more basic, constitutional structures to more complex entities, properties and relations. In this systems view, there is no essentiality in the objects of any kind; objects emerge from the networks of relationships, embedded in larger networks (Capra 1997: 36).





# Ontology Emotion





Corpus

+

Constructions

+

Ontology

Classification of **relations**  
between lexical concepts in  
constructions according to:

## The linguistic data restrictions

Gramatical relations determine

### Construal features:

argument /Frame structure with  
prototypical slots of semantic roles  
{AGENT process PATIENT with INSTRUMENT}...

## The knowledge about the emotions restrictions

Ontological relations determine

### TypeOfRelations features:

meronymic  
metaphoric...

A	B	C	D	E	F	G	H	I	J	K	L
NT Lemma	Collocation	Gram_rel	Freq	Score	Example	Source	SourceFrame	Target	TargetFrame	TypeOfRelation	Figurative
ponos	predstavljati	gl_post	549	5.89	s ponosom predstavlja	ponos	10.Affect.Emotion	predstavljati		N/A	
iznenadenje	predstavljati	gl_post	205	4.41	iznenadenje predstavlja	iznenadenje	10.Affect.Emotion	predstavljati		ont.meronymy.SURPRISE is	
ljutnja	prerasti	gl_post	10	3.53	Ljutnja je prerasla u udar	ljutnja	10.Affect.Emotion	prerasti		ont.violation.ANGER ISnot	
ljutnja	pretvarati	gl_post	17	3.4	Ljutnja se pretvara	ljutnja	10.Affect.Emotion	pretvarati		ont.violation.SORROW ISnot	
tuga	pretvarati	gl_post	25	3.63	tuga koja se rastvara i pr	tuga	10.Affect.Emotion	pretvarati		ont.violation.ANGER ISnot	
ljutnja	pretvoriti	gl_post	21	03.02	Ljutnja je splašnjavala i	ljutnja	10.Affect.Emotion	pretvoriti		ont.violation.ANGER ISnot	
tuga	pretvoriti	gl_post	42	3.81	tuga se pretvorila u revo	tuga	10.Affect.Emotion	pretvoriti		ont.violation.SORROW ISnot	
krivnja	preuzeti	gl_post	69	3.75	Krivnja može preuzeti va	krivnja	10.Affect.Emotion	preuzeti		ont.violation.GUILT ISnot C	
ponos	pričati	gl_post	94	3.6	s ponosom pričati	ponos	10.Affect.Emotion	pričati		N/A	
sram	pričati	gl_post	78	3.42	sram pričati (17%)	sram	10.Affect.Emotion	pričati		N/A	
radost	prihvaćati	gl_post	103	4.89	s radošću prihvaćaju	radost	10.Affect.Emotion	prihvaćati		N/A	
krivnja	pripisivati	gl_post	59	5.26	Krivnja se pripisuje	krivnja	10.Affect.Emotion	pripisivati		ont.violation.GUILT ISnot C	
ponos	prisjećati	gl_post	80	5.57	s ponosom prisjećamo	ponos	10.Affect.Emotion	prisjećati		N/A	
tuga	prisjećati	gl_post	52	5.37	s tugom prisjeća	tuga	10.Affect.Emotion	prisjećati		N/A	
ponos	priznati	gl_post	61	3.31	s ponosom priznati	ponos	10.Affect.Emotion	priznati		N/A	

Corpus

+

Constructions

+

Ontology

+

Emotion

Meronymic  
TypeOfRelations

- Meronymic relations express **mereological structure** of the EMOTIONS emergent entities in terms of **constituent entities**:

A isPartOf / co-ocuresWith B, B {A,..., Xn}

- informational (un)directional **binding network structure** creates the basis of part-whole **metonymic profiling**

A FOR B , B FOR A

Function: recreating the **embodied feeling**

ljutnja gađenje strah krivnja sreća ljubav ponos tuga sram iznenađenje  
anger disgust fear guilt happiness love pride sadness shame surprise

Construction:  
[EMOTION in X]

fear in heart 2,775  
fear in stomach 79

Feel

Construction	Collocation	Coocuren	Score logDi	Collocation Domain
fear in	heart	2,775	4.321	08.Animacy.Organism.PartOfBody
fear in	eye	2,058	3.636	08.Animacy.Organism.PartOfBody
fear in	mind	875	2.308	15.SocCult.Mind
fear in	face	664	1.676	08.Animacy.Organism.PartOfBody
fear in	voice	501	2.633	08.Animacy.Organism.BiologicalBehaviour
fear in	stomach	79	1.959	08.Animacy.Organism.PartOfBody
fear in	gut	72	2.842	08.Animacy.Organism.PartOfBody
fear in	belly	45	2.002	08.Animacy.Organism.PartOfBody
fear in	throat	31	1.158	08.Animacy.Organism.PartOfBody
fear in	psyche	16	2.36	15.SocCult.Mind
fear in	bosom	6	1.451	08.Animacy.Organism.PartOfBody



Corpus

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Constructions

+

Ontology

+

Emotion

Meronymic  
TypeOfRelations

09.Animate.Cause.{CAUSER causes in a sequence EVENT}							
A	B	C	G	H	I	J	K
NT Lem	Collocation	Gram	Source	SourceFrame	Target	TargetFrame	TypeOfRelation
radost	činiti	is_obj4	činiti	03.Mat_structure.Do_Činiti{PART čini makesPartOf V	radost	10.Affect.Emotion	ont.meronymy.JOY is WHOLE that is CREATED (by PARTS).
ljubav	dogoditi	is_obj4	dogoditi	07.Sequence/Time.Happen{EVENT happens}	ljubav	10.Affect.Emotion	ont.meronymy.LOVE is EVENT that HAPPENS. HAPPEN FO
strah	uzrokovati	is_obj4	uzrokovati	08.Animacy.Process.Cause	strah	10.Affect.Emotion	ont.meronymy.FEAR is AFFECT.EMOTION that is CAUSEd
ljutnja	uzrokovati	is_obj4	uzrokovati	08.Animacy.Process.Cause	ljutnja	10.Affect.Emotion	ont.meronymy.ANGER is AFFECT.EMOTION that is CAUSEd
tuga	uzrokovati	is_obj4	uzrokovati	08.Animacy.Process.Cause	tuga	10.Affect.Emotion	ont.meronymy.SADNESS is AFFECT.EMOTION that is CAUS
radost	živjeti	is_obj4	živjeti	08.Animacy.Process.Live	radost	10.Affect.Emotion	ont.meronymy.JOY is EMOTION isPartOf CULTURAL MODI
ljubav	živjeti	is_obj4	živjeti	08.Animacy.Process.Live	ljubav	10.Affect.Emotion	ont.meronymy.LOVE is EMOTION isPartOf CULTURAL MOI
radost	značiti	is_obj4	značiti	08.Animacy.Process.Live	radost	10.Affect.Emotion	ont.meronymy.JOY is EMOTION has REPRESENTATION has
strah	izazivati	is_obj4	izazivati	09.Animate.Cause.{CAUSER causes in a sequence EV	strah	10.Affect.Emotion	ont.meronymy.FEAR is AFFECT PROCESS that is CAUSED.
gađenje	izazivati	is_obj4	izazivati	09.Animate.Cause.{CAUSER causes in a sequence EV	gađenje	10.Affect.Emotion	ont.meronymy.DISGUST is AFFECT PROCESS that is CAUSE
radost	izazivati	is_obj4	izazivati	09.Animate.Cause.{CAUSER causes in a sequence EV	radost	10.Affect.Emotion	ont.meronymy.JOY is AFFECT PROCESS that is CAUSED.
ljutnja	izazivati	is_obj4	izazivati	09.Animate.Cause.{CAUSER causes in a sequence EV	ljutnja	10.Affect.Emotion	ont.meronymy.ANGER is AFFECT PROCESS that is CAUSED
ponos	izazivati	is_obj4	izazivati	09.Animate.Cause.{CAUSER causes in a sequence EV	ponos	10.Affect.Emotion	ont.meronymy.PRIDE is AFFECT PROCESS that is CAUSED.
tuga	izazivati	is_obj4	izazivati	09.Animate.Cause.{CAUSER causes in a sequence EV	tuga	10.Affect.Emotion	ont.meronymy.SADNESS is AFFECT PROCESS that is CAUSI
sram	izazivati	is_obj4	izazivati	09.Animate.Cause.{CAUSER causes in a sequence EV	sram	10.Affect.Emotion	ont.meronymy.SHAME is AFFECT PROCESS that is CAUSEd
strah	izazvati	is_obj4	izazvati	09.Animate.Cause.{CAUSER causes in a sequence EV	strah	10.Affect.Emotion	ont.meronymy.FEAR is AFFECT PROCESS that is CAUSED.
gađenje	izazvati	is_obj4	izazvati	09.Animate.Cause.{CAUSER causes in a sequence EV	gađenje	10.Affect.Emotion	ont.meronymy.DISGUST is AFFECT PROCESS that is CAUSE
radost	izazvati	is_obj4	izazvati	09.Animate.Cause.{CAUSER causes in a sequence EV	radost	10.Affect.Emotion	ont.meronymy.JOY is AFFECT PROCESS that is CAUSED.
ljutnja	izazvati	is_obj4	izazvati	09.Animate.Cause.{CAUSER causes in a sequence EV	ljutnja	10.Affect.Emotion	ont.meronymy.ANGER is AFFECT PROCESS that is CAUSED
tuga	izazvati	is_obj4	izazvati	09.Animate.Cause.{CAUSER causes in a sequence EV	tuga	10.Affect.Emotion	ont.meronymy.SADNESS is AFFECT PROCESS that is CAUSI





Corpus

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Constructions

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Ontology

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Emotion

Violation of  
meronymic  
relations

The next step in “emotion” OMLCC is to identify the collocations (typeOfRelations) that **violate the mereological structure** for any constituent of the linguistic construction

Ex. *fear comes* {**ACTOR.MOVER** comes to X}, *joy gives* {**AGENT.GIVER** gives X to Y}

The violation is defined as **non-existent ontological/mereological relation between any two lexical units that are syntactically joined in the linguistic construction.**

The metaphoric relation (function)

**A<sub>(EMOTION)</sub> ISnot B, A has not elements of B**  
but process A and B together and map elements of B with A

Via knowledge of the language,  
entity A maps the properties of the entity B,  
activating mereological structure of the entity B: B hasParts{C....Y}

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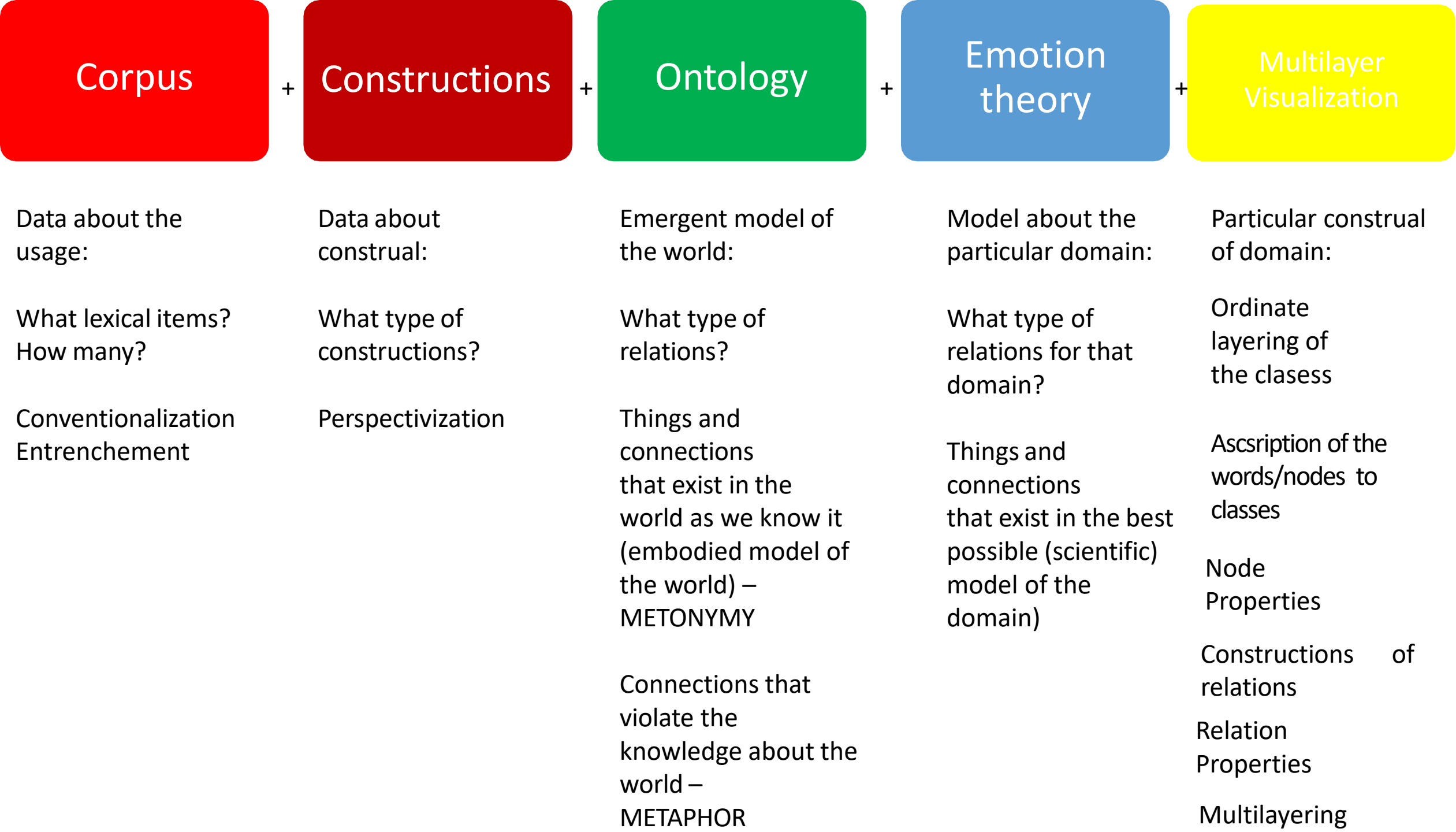
Emotion

Violation of  
meronymic  
relations

05.Force.Catch{FORCE\_STRUCTURE holds OBJECT SpatiaRelation:Locative} ISpartOf 13.SocBehaviour.Catch{AGENT catches AGENT}

A	B	C	J	K	
NT Lem	Collocation	Gram	TargetFrame	TypeOfRelation	Figurativer
krivnja	postojati	gl_post	01.Existence.Exist{OBJECT EXISTS}	ont.violation.GUILT ISnot OBJECT that EXISTS. EXIST FOR CATEGORIZE	metaphor
ljubav	postojati	gl_post	01.Existence.Exist{OBJECT EXISTS}	ont.violation.LOVE ISnot OBJECT that EXISTS. EXIST FOR CATEGORIZE	metaphor
strah	postojati	gl_post	02.Emergence.Become{ENTITY1 become (I	ont.violation.FEAR ISnot OBJECT that EXISTS. EXIST FOR CATEGORIZE	metaphor
tuga	prolaziti	gl_post	02.Emergence.Emerge	ont.violation.PRIDE ISnot MOVER that PASSes. PASS FOR APPRAISAL.COPING.	metaphor
ljutnja	pretvarati	gl_post	02.Emergence.Transformation	ont.violation.SADNESS ISnot OBJECT that is TRANSFORMED into X.	metaphor
tuga	pretvarati	gl_post	02.Emergence.Transformation	ont.violation.ANGER ISnot OBJECT that is TRANSFORMED into X.	metaphor
ljutnja	pretvoriti	gl_post	02.Emergence.Transformation	ont.violation.ANGER ISnot OBJECT that is TRANSFORMED into X.	metaphor
tuga	pretvoriti	gl_post	02.Emergence.Transformation	ont.violation.SADNESS ISnot OBJECT that is TRANSFORMED into X.	metaphor
strah	činiti	gl_post	03.Mat_structure.Do_Činiti{PART čini mak	ont.violation.FEAR ISnot AGENT that ACT/CAUSEs. ACT FOR APPRAISAL.COPING. POWER/CONTROL,	
radost	činiti	gl_post	03.Mat_structure.Do_Činiti{PART čini mak	ont.violation.FEAR ISnot AGENT that ACT/CAUSEs. ACT FOR APPRAISAL.COPING. POWER/CONTROL,	
ljubav	činiti	gl_post	03.Mat_structure.Do_Činiti{PART čini mak	ont.violation.LOVE ISnot AGENT that ACT/CAUSEs. ACT FOR APPRAISAL.COPING. POWER/CONTROL,	
ponos	izgubiti	gl_post	03.Mat_Structure.Loose{OBJECT.POSSESO	ont.violation.PRIDE ISnot OBJECT.POSSION that is LOST. LOST FOR APPRAISAL.COPING.C	metaphor
ljubav	nemati	gl_post	03.Mat_structure.Not Have	ont.violation.LOVE ISnot OBJECT that is NOT HAVE. NOT HAVE FOR EXPERIENCER	metaphor
strah	nemati	gl_post	03.Mat_structure.Not Have{OBJECT.WHOL	ont.violation.FEAR ISnot OBJECT that is NOT HAVE. NOT HAVE FOR EXPERIENCER	metaphor
krivnja	nemati	gl_post	03.Mat_structure.Not Have{OBJECT.WHOL	ont.violation.GUILT ISnot OBJECT that is NOT HAVE. NOT HAVE FOR EXPERIENCER	metaphor
iznenader	nemati	gl_post	03.Mat_structure.Not Have{OBJECT.WHOL	ont.violation.SADNESS ISnot OBJECT that is NOT HAVE. NOT HAVE FOR EXPERIENC	metaphor
strah	izgledati	gl_post	03.Mat_Structure.Shape ISpartOf 09.Perce	ont.violation.FEAR ISnot OBJECT.VISUAL that LOOKS like X. LOOKS FOR REACTION	metaphor
tuga	hvatati	gl_post	05.Force.Catch{FORCE_STRUCTURE holds C	ont.violation.SADNESS ISnot AGENT that CATCHes. CATCH APPRAISAL.COPING. PC	metaphor
ljutnja	poticati	gl_post	05.Force.Entice{FORCE_STRUCTURE.PROM	ont.violation.ANGER ISnot MOVER that PROMOTEs. PROMOTE FOR APPRAISAL.COPING.	metaphor
ponos	držati	gl_post	05.Force.Hold{FORCE_STRUCTURE holds C	ont.violation.PRIDE ISnot FORCE_STRUCTURE that HOLDs X. HOLD for APPRAISAL.COPIN	metaphor
radost	širiti	gl_post	05.Force.Spread	ont.violation.JOY ISnot OBJECT that is SPREAD. SPREAD FOR EMOTION CONTAGION	metaphor





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Emotion  
theory

Multilayer  
Visualization

## Towards Visualization of linguistic conceptualization

The ontological model of lexical concepts and constructions (OMLCC) enables us to:

- **define established meronymic relations of emotion**
- **define metaphorical mapping as violation of meronymic relations to form extensions and create new meanings.**
- **define functions of the specific construction in the multilayered conceptual network**
- **formalize identification of metaphoric constructions** and other types of figurative speech, (compare cross-culturally metaphorical networks).
- **reveal correlation between syntactic-semantics construal and different types of metaphoric mapping (ontology violation)**
- **Results of the analysis will be presented: Cro Metaphor Repository:**  
[www.ihjj.hr/metafore](http://www.ihjj.hr/metafore)

**EmocNet research group:**

[www.emocnet.uniri.hr](http://www.emocnet.uniri.hr)



ljutnja gađenje strah krivnja sreća ljubav ponos tuga sram iznenađenje



anger disgust fear guilt happiness **love** pride sadness shame surprise

Thank you!

Happy to answer some questions.

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