

CHAPTER 19

CONCEPTUALIZATION OF THE EMOTION TERMS: STRUCTURING, CATEGORIZATION, METONYMIC AND METAPHORIC PROCESSES WITHIN MULTI-LAYERED GRAPH REPRESENTATION OF THE SYNTACTIC AND SEMANTIC ANALYSIS OF CORPUS DATA

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1. Introduction

This paper¹ presents a study on the conceptualisation of nominal emotion lexemes, exemplified by Croatian words: *strah* ‘fear’, *ljutnja* ‘anger’, *ljubav* ‘love’ and *ponos* ‘pride’, combining several complementary methods and theoretical approaches. The main goal of the study is to discuss theoretical framework and methods for analysing conceptualization networks in linguistic communication from the perspective of the (complex) system theory (Capra 1997, Clayton et al. 2006, Perak and Puljar 2013) and related theoretical frameworks of embodied cognition (Barsalou 2008), componential appraisal theory of emotion (Scherer 2009, Fontaine, Scherer and Soriano 2013), cognitive linguistic approaches to the figurative language conceptualization of emotions (Kövecses 2000, Langacker 2008), and cultural linguistics notion of socially distributed cognition (Sharifian 2015). A system approach of emotional expression takes into account the configurations of different parts involved in the dynamics of the biological, psychological and sociological affective phenomena connected and joined together by a web

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of relationships. Such an interdisciplinary approach allows us to postulate the problem of the intersubjective communication of affective states in an ontologically non-reductive manner that seeks to reveal what are emotions, how we express emotion concepts in language and what are the patterns of linguistic expression of emotion concepts.

The emotions are defined as part of the affective consciousness (Panksepp 2007) with functions to enable an organism to dynamically react to perceived environmental contingencies (Scherer 2009). These privative experiences with adaptive physiological response patterns prepare the organism to deal with various events in their lives presenting a strong motivational force for behaviour patterns (Frijda 2007). The appraisal of emotions is related to cognitive aspects including: attention, memory, motivation, reasoning and self-reflection (Scherer 2009, 3466). Due to the subjective ontological status of the emotional feeling, the emotional categories are constructed in the intersubjective communication via the process of conceptualization that includes figurative language: metonymical (part for whole) profiling of embodied affective components (features) and metaphorical (cross-domain) mappings. As a part of the intersubjective behaviour, the linguistic expressions of emotions reflect emergent structure of bio-psycho-social complexity of emotional phenomena. Their function is to activate and organize embodied knowledge about emotion categories. The aim is to reveal the systematic nature of these symbolic structures, and compare most frequent conceptualizations of nominal emotion lexemes in terms of syntactic-semantic patterns. We call this systemic approach the ontological model of lexical concepts and construction. In this paper the structural ontological analysis of the salient conceptualizing emotion patterns is illustrated by four very frequent nominal lexemes in Croatian: two of which refer to bio-psycho-social emotional categories with negative hedonic valence (*strah* 'fear', *ljutnja* 'anger'), and two with positive valence (*ljubav* 'love', *ponos* 'pride').

2. Theory, data resources and bottom-up methodology of analysis

The theoretical approach to the linguistic analysis of emotional conceptualization in this study has its roots in the frameworks laid by influential and seminal works from Lakoff and Johnson (1999), and Kövecses (2000). However, it is further developed from the perspective of the usage-based theory of language acquisition (Tomasello 2003) that includes construction grammar (Langacker 2008) and corpus analysis

methodology. The main idea of this bottom-up approach is that emerging patterns of the linguistic constructions reflect conceptualization schemes organized by relational embodied knowledge. As frequent ways of symbolic construal of the embodied experiences and sociocultural concepts, the patterns of conceptualization are reinforced in the social communication and entrenched in the neurocognitive organization of the individuals that make a socio-linguistic community. In this sense, the linguistic communication organizes conceptual networks that are latently manifested in the socially distributed cognition. To reveal the salient conceptualization patterns for the 4 emotional lexical concepts, this study uses corpus data assuming that network analysis reveals typical features of semantic-syntactic construal of emotional expression in the linguistic usage. The data in this study is extracted from large web corpus hrWaC14 (Ljubešić and Klubička 2014) (1,2 Gw) obtained from top-level .hrweb domain up to the year 2011. The data for the English is derived from the enTenTen2013 (19 Gw) of corpus gathered up to the 2013 (<https://www.sketchengine.co.uk/ententen-corpus/>).

The bottom up approach essentially involves corpus collocation patterns analysis of the emotional lexemes conceptualization that form syntactic-semantic constructions. The syntactic-semantic construction analysis of the nominal emotional lexemes is grounded on the identification of the hierarchical system of linguistic constructions along with their cognitive motivation, argument structure, and respective semantic roles. The hierarchical organization implies that the more complex conceptual structures emerge from the cognitive networks of conceptually more basic, constitutional structures. In this systems view, there is no essentiality in the objects of any kind, be it a material structure, psychological phenomenon such as emotion or a socio-cultural concept. Objects themselves emerge from the networks of relationships, embedded in larger networks (Capra 1997, 36). In order to describe the structure and the function of an emotion “object”, it is necessary to reveal: a) the relationships with its constituents, b) the relationships with objects of the same ontological level, as well as c) the constituent roles of the object in emergent relationships. This dynamic-systems approach to the linguistic conceptualization enables us to define the cognitive and communicative structures and functions of the semantic-syntactic constructions, as well as to quantitatively and qualitatively compare the ontological relations of the lexical concepts across the studied constructions.

3. (Morpho)syntactic construal of emotional lexemes

In accordance with the constructional grammar (Langacker 2008) we assume that the conceptualization of the emotions as entities, properties and processes occurs by respective coding into the nominal, adjectival, adverbial or verbal emotion lexemes. The study focuses on the construal with nominal target (NT) constructions [EMOTION^{NOUN} TARGET (NT)₊ LEXICAL CONCEPT^{COLLOCATION}]. The meaning is profiled by syntactic-semantic relations with collocated lexical concepts.

	Construction type	Syntactic Properties	Cognition type	Semantic Properties
I)	Existential	[NT+ existential verb]	Is-ness	The entity exists as an object.
II)	Attribution	[ADJ ^{modifier} +NT]	Property	What are the salient properties attributed to the emotion?
III)	Apposition	[NT ^{modifier} +N[V]	Modifier	What are the salient entities and events modified by the emotion?
IV)	Figure spatial	[NT ^{Figure} +Preposition]	Spatial, (temporal, causal)	What are the spatial/logical/causal relations when coded as figure?
V)	Ground spatial	[Preposition+NT ^{Ground}]	Spatial, (temporal, causal)	What are the spatial/logical/causal relations when coded as ground?
VI)	Thematic processual	[Verb+NT ^{object}]	Processual argument structure	What processes can you (conceptually) do with the emotion coded as object?
VII)	Agentive processual	[NT ^{Subject} +Verb]	Processual argument structure	What processes (can you conceptualize) an emotion can do when coded as subject?
VII)	Coordinated	[NT and/or N]	Association, near synonym, antonym	What are the conceptually related concepts?

Various constructions reveal special type of cognitive structures and functions, adding up to the knowledge about the target lexical concept. The emergent meaning activated by a linguistic construction depends on the prototypical world knowledge about the ontological status of the target and source domains, as well as on the conventional linguistic knowledge elicited by the respective syntactic positions (arguments) and semantic roles of the lexical concepts. The linguistic constructions construe the emotional category in a manner that elicits mental representation of a specific autonomic, motoric and behavioural response and produces a cognitive appraisal.

This article presents the ontological syntactic-semantic analysis of [ADJ^{modifier}+NT] construction revealing the salient properties attributed to the emotion. The conceptual patterns of attribution are classified according to the ontological congruence between the emotion concept, coded as a nominal target lexeme, and the profiled attributed property, coded as adjectival modifier. The ontological congruence is defined as the agreement of prototypical ontological properties in the target emotion semantic frame and the prototypical ontological properties of the collocated modifier semantic frame.

4. Frame semantics

In accordance to the Frame semantics (Fillmore 1985, Cruse 2004, 137), the emotion lexemes are conceptually related to other concepts invoked by the emotion semantic frame. The FrameNet defines several core semantic roles in the emotion frame(s).²The Emotion (Emot) is thus the feeling or the Emotional_State (Emo_s) the Experiencer (Exp) experiences. The Expressor (Exr) is part of the body that expresses the reaction. The Evaluation (Eval) of the internal experiential state is a negative or positive assessment of the Experiencer regarding his or her Emotional_state caused by Stimulus (St) regarding some Topic (T). It is argued that linguistic constructions express the conceptualization of emotions in relations to the frame concepts referring to actors, states, actions, objects, locations, causes, changes, and purposes in such a way that a resulting construal activates **ontological relations** between the salient concepts in the emotion frame.

4.1 Class inclusion, meronymy and metaphor

The congruence/incongruence of lexicalized concepts and semantic roles, activated by the ontological relations in the linguistic constructions, can result in class inclusion, meronymic, and metaphoric conceptualizations. The class inclusion refers to the forming of prototypical categories and their hyponymy members “X’s are type of Y”. The meronymic relations involve the part-whole relations between the core roles or components of an entity, object or event: “X’s are part of Y”. Class inclusion and meronymy are distinguished by “kind of” and “part of” expressions. For example, expression (5) refers to the categorization of love as a *kind of* emotion, but we would not consider shaking as a *kind of* fear. Instead, we can think about the reaction of shaking as a *part of* fear (6).

- (5) Ljubav je emocija.
Love is an emotion. Class inclusion “love is a *kind of* emotion”
- (6) Tresem se (od straha).
I’m shaking (because of fear). Meronymy “shaking is a *part of* fear”

The identification of the meronymic relations in the emotion domain/class involves the emotion (cultural) model dimension. The emotion models are part of the larger cultural model, defined as cognitive schemas that are intersubjectively shared by a social group (D’Andrade 1987, 112). The

²<https://framenet2.icsi.berkeley.edu/fnReports/data/frameIndex.xml?frame=Feeling>

emotion models are thus representations about emotions shared by members of a culture, propagated by certain members, in certain time/event and through certain media. They are used to attain certain emotional states (Bennardo and de Munck 2014, 5) and are highly interconnected with the collectively and individually attained knowledge about the world and other cultural models (such as the mind/body model, or self and consciousness models. In his work on the conceptualization of emotions, Zoltán Kövecses (2000, 58) analyses folk emotion theory as a five-staged sequence model. In this folk model some event causes emotion, emotion causes reactions, followed by control over reactions or loss of control and a behavioural response. This model is largely influenced by Cartesian dualism and rational essentialism that has been in recent times critiqued by the leading scientist in Cognitive and Affective science (Damasio[1994] 2005). After the popularization of scientific research on emotions, new ideas have been introduced in the emotion discourse, reflecting conceptualizations from different scientific models (Scherer 2013). These models usually differ in their epistemic approaches and introduce different type of parts they consider relevant for the emergence of specific emotion class as well as the causation scripts of the emotion process. Our analysis of the meronymic relations takes the systemic perspective based on the Appraisal theory of Emotions and Scherer's Component process model (Scherer 2009 and 2013). This means we view emotions as emergent phenomenon arising from the synchronization of several bio-psycho-sociological systems that represent meronymic components with dynamic roles in shaping the classes of emotion categories. The ontological structure of the component process model, described in the OWL³ format by Barry Smith, Janna Hastings, Kevin Mulligan (Hasting et al 2001).

Every specific emotion category is defined by its prototypical configuration of components forming a dynamic network. The recognition of this meronymic network structures the embodied knowledge about emotions. The components of this knowledge are phylogenetically inherited and ontogenetically developed in the ecological context through the social behaviour and interaction, a part of which is the symbolic linguistic communication. The linguistic knowledge concerning how to express emotion classes and construe the evaluation of their different configurations plays a large role in the development of the knowledge about emotions. Informational (un)directional binding "*part of*" meronymic network structure in linguistic coding creates the basis for the

³The ontology can be downloaded at <http://www.ontobee.org/ontology/MFOEM>.

part-whole metonymic profiling A FOR B, or B FOR A. Its cognitive function in communication is related to the profiling of a salient part/component/feature/phase in the emotion model, and a mental (re)presentation/(re)creation of a certain embodied emotional process (Perak 2014).

Besides the class schematizations and metonymic profiling, the emotions are conceptualized by the metaphoric constructions. The metaphor is defined in this system as a process that activates mappings between two classes/concepts that are ontologically unrelated in the referent cultural model. The metaphoric mappings establish new emergent mental representations using the network structure of previously established meronymic relations. Identification of the metaphor can thus be formalized as follows: the construction produces metaphoric conceptualizations if the collocated lexemes in a construction activate mental representation involving the violation of ontological relations defined by the prototypical semantic roles of the constituents. The violation is defined as a non-existent in-class inclusion or mereological relation between any two lexical units that are syntactically joined in the linguistic construction. The metaphoric relation (function) can thus be expressed: “A IsNot B, A has NotPart of B, but process A and B together and map elements of B with A. In order to be processed, the element B has to have an established meronymic network which is by process of joining activated and transfers the representational properties of the salient meronymic structures to the element A.

- (7) Vatreña ljubav.
‘Fiery love’

Construction: Attribution [ADJ^{modifier}+NT]
Love IsNot Fire, Love hasNotPart Fire → Join Love with Fire → FIRE
has WARMTH (WARMTH FOR PLEASURE, body ACTIVITY,
PHYSICAL CONTACT with WARM.OBJECT), FIRE has
FORCE.INTENSITY (FORCE.INTENSITY FOR
AFFECT.INTENSITY.PASSION), etc.

Why does this cognitive process occur in the first place? The function of the metaphoric mappings is to establish new conceptual networks in the emotion event-structure scheme, and enable new types of conceptualizations about an event. Although they mostly do not stand up to the test of referencing something ontologically real, the metaphorical representations elicit new psychological motivations and appraisals. We can think about the emotion metaphors as an inherent human cognitive capability to expand the knowledge about emotions by new

and the lexicalized emotions ljubav ‘love’, ponos ‘pride’, ljutnja ‘anger’, strah ‘fear’ are target nodes (NT). There are 136 nodes/lemmas with 176 edges/relations. The yellow coloured nodes are connected to one target lexeme, the blue nodes to two target lexemes, the violet nodes to three, and green nodes to four emotion lexemes.

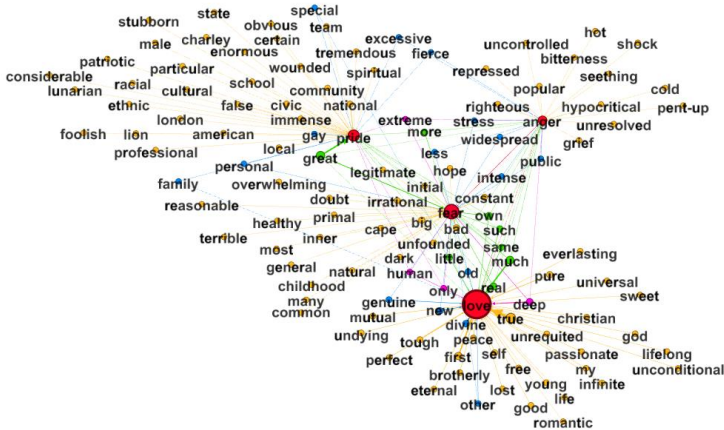


Figure 2. Force layout graph representation of the 50 most frequent [ADJ^{modifier}+NT] relations in the enTenTen corpus. The lexicalized emotions love, pride, anger and fear are target nodes (NT). The adjectives are source nodes. There are 127 nodes with 174 edges. The yellow coloured nodes are connected to 1 target node, the blue nodes to 2 target nodes, the violet nodes to 3 NT, and green nodes to 4 emotion lexemes. The size of the target nodes reflects the frequency of collocation occurrence.

Such a directed graph representation produces the out-degree measure, the number of links from a source node to different target nodes, enabling us to see the more distinctive or common types of collocations, in the high frequent collocation range. In the construction [ADJ^{modifier}→*love* | *anger* | *pride* | *fear*^{NT}] adjective modifiers are the source and the emotional lexemes the target nodes. The nodes with the out-degree value 1, considered as distinctive features of meaning, are coloured yellow. For instance, in the enTenTen corpus (Fig.2) adjective *everlasting* is connected to *love*, adjective *national* to *pride*, *terrible* to *fear*, *righteous* to *anger* and not with other emotion lexemes (in the range of 50 most frequent types). This does not mean that these properties are absolutely exclusive to the target lexeme, but more frequently attributed to these concept(s). On the other hand, some source nodes can have relations to several target lexemes, such as spatial attribute *deep* that is collocated with *love*, *fear* and

anger but not with *pride*, or the attribute *great* collocated with all target nodes. The more the source node has common target connections, the less it is semantically distinctive. However, the proximity of the nodes with multiple edges in the force layout is also indicative in the frequency dimension. For instance, the graph reveals that adjective *deep* is more frequently attributed to *love* than *fear* or *anger*.

4.3 Ontological model of concepts and constructions

The problem with Force layout graphs is that they do not reflect the information about the type of relation. In order to reveal the ontological relations that are inherent in the cognitive processing of the constructions, we have to add the information about the ontological properties of concepts and their emergent hierarchical levels. Therefore, we devised the Ontological Model of Lexical Concepts and Constructions (OMLCC) that is grounded on the system's theory and ontological relations between concepts. The OMLCC structure of data is used to formalize identification of ontological relations (in class inclusion, meronymy, meronymic violation) and respective semantic relations (categorization, metonymy, metaphor) between the constituents of a construction, visualizing it in the circular layout graph. The first step in the process of modelling the OMLCC is to classify entities, properties and processes (lexical concepts) in the appropriate emergent hierarchical domain according to their ontological and epistemic status, or properties. The OMLCC has 4 ontological domains and 15 super classes (Table 2).

Table 2. Emergent hierarchy of ontological domains, super classes and their general properties.

Ontology domain	Superclass	Level Property
EXISTENCE	01.Existence	A (Entity) exists MeronymicRelation: stuff — object
MATERIAL	02.Emergence	A (Form) becomes B (Transformation) MeronymicRelation: portion — mass
	03.Mat_Structure	A (Part) 1...n isPartOf B (Whole), B (Whole) hasParts A1...n (Part); MeronymicRelation: component— (complex) object, member — collection
	04.Spatial	A(Figure) is_in_spatial_relation_to B(Ground); MeronymicRelation: place — area
	05.Force	A(Force Structure) influences (by mechanical / liquid / thermodynamic force) B (Patient); MeronymicRelation: force – motionAction
	06.MotionAction	A (Mover/Actor has Force) moves /acts (on) B (Path/Patient 03-04) with (Vehicle/Instrument 03); MeronymicRelation: feature — event
	07.SequenceTime	A (TimeEntity) has sequence (3-5); MeronymicRelation: phase — activity

	08.Animacy	A (Animate) {self-sustaining structure, organism} acts/reacts (to) B (Environment 1-8) MeronymicRelation: action – reaction
PSYCHOLOGICAL	09.Perception	A (Perceiver 8-11) perceives 9 (with_instrument_of_perception 8) B(object of perception 1-8) MeronymicRelation: perception – reaction, perception – percept (mental representation)
	10.Affect	A (Experiencer 8-14) experiences (with_organs_of_affect_experience 8) B (experience / quality / affect state / emotion 10) MeronymicRelation: perception – affect, affect –affect appraisal
	11.Cognition	A (Cogitor 8-14) remembers, reasons, thinks 11 B (Mental_Representation / Categorization / Cognitive Appraisal 11) MeronymicRelation: affectappraisal – cognition (attention, memory, motivation, reasoning, self) - agent
SOCIAL AND CULTURAL	12.SocIdentity	A (Person 8-14) identifies as B (Social Identity 12) MeronymicRelation: agent – social group
	13.SocBehaviour	A (Person.Agent 8-14) behaves , performs B (social_action/ritual 13) with (instruments_of_behavior 1-8) MeronymicRelation: agent – behaviour - instruments
	14.SocCommunication	A (Person.Agent.Communicator 8-14) communicates with B (Reciever 8-14) about C (Theme 1-14) on D (Symbolic Code) MeronymicRelation: agent – communication – symbolic code
	15.SocCultural	A (Cultural Model) is a set of values expressed by the symbolic code, connected with material things, experience, events and rituals, narration, philosophy, individual and social values, institutions shared by agents/members of the Social community.

This schematic classification determines prototypical in class inclusion relations for lexical concepts, creating the node list. In the process of categorical classification, identified lexical concepts are schematically indexed in an emergent hierarchical ontology structure Entity>Superclass>Subclass_{x,y}>Class. Each concept is labeled with the typical semantic frame that involves a subset of semantic roles described by the referent ontological model. The list of lexical concepts and their properties form the OMLCC node list database. The properties in the node list database can include information about the lexemes such as part of speech, language (8), or other types of information such as the synonymous lexemes, polysemous frame, etymology, etc. For this purpose a WordNet taxonomy and other language specific semasiological and onomasiological lexical resources, such as synonymy dictionaries (Šarić 2010), can be used to determine lexical units for the in class inclusion classification.

(8) *love* | 10.Affect.Emotion.Love |{EXPERIENCER experiences AFFECTSTATE.LOVE hasPart AUTONOMIC REACTION, MOTOR EXPRESSION, BEHAVIOURAL TENDENCY, CAUSE, APPRAISAL}|
Noun | English

The classes and instances of lexical concepts are graphically represented in a circular clockwise layout (Figure 4-5).

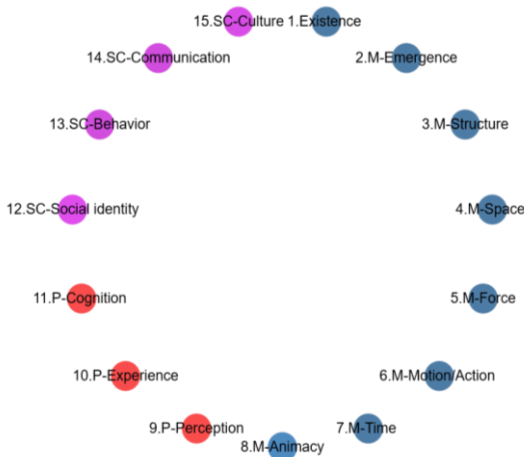


Figure 4. The clockwise circular visualization of the emergent hierarchy of the ontological model of concepts. Blue nodes represent material, the red nodes psychological and violet nodes socio-cultural ontology domain super classes.

4.4 Type of relations classification

Next phase in the construction of the OMLCC is to create an edge list and classify the “type of relations” among collocated lexemes in the constructions. For the purpose of the syntactic-semantic analysis the collocations are lemmatized and represented as ordered pairs (source node, target node). The “type of relation” classification determines whether the construed representation reflects the meronymic relation, resulting in the metonymic profiling (9), or violates the established meronymic relation, creating metaphoric mappings (10).

- (9) (*ljutnja* ‘anger’, *trajati* ‘last’), frequency: 34, score: ,
Example: *Ljutnja ne traje dugo*. “Anger doesn’t last long”
- (10) (*velika* ‘big’, *ljubav* ‘love’), Frequency: 6756, Score: 6.15, Type of construction: [ADJ^{modifier}+NT], Source node frame: 04.Spatial.Size.Big{OBJECT has SIZE.BIG}, Target node frame: 10.Affect.Emotion.Love{EXPERIENCER experiences AFFECT STATE.LOVE hasPart AUTONOMIC REACTION, MOTOR EXPRESSION, BEHAVIOURAL TENDENCY, CAUSE, APPRAISAL}, Type of relation: ont.violation.EMOTION.LOVE ISnot OBJECT that has SIZE.BIG. BIG FOR APPRAISAL.RELEVANCE, Figurativeness: Metaphor-EMOTION IS PHYSICAL OBJECT WITH SIZE. Language: hr.

The classification is determined by analysing the congruency of the constituent's expected prototypical semantic frames and construed constituent's semantic roles in a construction. As is described in the previous section, the typical semantic frame for emotions includes Experiencer, Emotion state, Expressor, Causer, Reactions etc. The congruency between the expected prototypical properties of emotional semantic frame and construed semantic roles of emotion collocates enables us to formally describe the semantic function of the construction in relation to the emotion appraisal model. In the case of the congruent meronymic relations for the emotion domain, we can determine the semantic functions of a metonymic profiling as the cognitive focus on a specific emotion component and/or appraisal process. On the other hand, the metaphoric construal is defined as a mental representation involving meronymic incongruence/violations in the emotion domain that uses associative activations in the meronymic network of some other source domain to elicit specific appraisal function or an emotion phase. Both types of construal produce embodied recreation of an emotion category, attention, memory, motivation, reasoning and self-reflection using different representational strategy.

In the emotion OMLCC graph representation, the collocations are visualized as ordered pairs with nodes in their respective hierarchical ontology. The different types of relations are visualized with different edges colours: green for the meronymic relation and red for the meronymic violation. The edge thickness indicates the frequency of the occurrence.

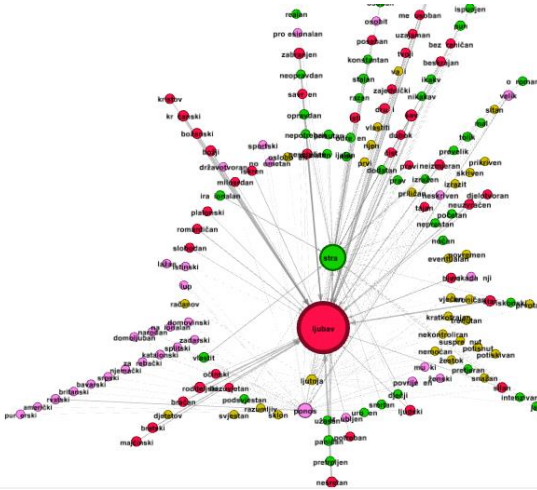


Figure 5. OMLCC graph representation of [ADJ^{modifier} NT] construction for 20 most frequent type of collocates.

The target nouns are in the middle, each with its own colour: love – red, fear – green, anger – yellow, pride - pink. The source domains (adjectives) are clockwise organized in 15 super classes representing hierarchical ontology of human cognition, starting from the most basic 01.Existence to the most complex 15.SocCultural class. Emergent principle implies that complex features arise from the more simple ones, but are not reduced by them. The colours of the source nodes represent the measure of the association with the respective target domain.

The above mentioned methods can be used to visualise data in other constructions. It is argued that the qualitative results, represented in a multi-layered network of superimposed layers, express the conceptual knowledge of the emotion categories and the function within dynamic appraisal process. The quantitative results of the analysis are interpreted in accordance with the usage-based model of cognitive linguistics as the relative measure of the conventionalization and cognitive entrenchment of the constructions and functions.

5. Conclusion

The article presents a corpus-based approach of identifying figurative conceptualization of emotions. It shows the value of the graph analysis of syntactic-semantic constructions as the conceptual networks. The corpus

approach makes it explicit which and how many of the collocations for a given construction is analysed/represented in the analysis. The quantitative results of the analysis are interpreted in accordance with the usage-based model of cognitive linguistics as the relative measure of the conventionalization and cognitive entrenchment of the constructions and functions. Different types of graph visualizations are presented, highlighting the function of analysis by means of frequency, bi-dimensional emotional model, and emergent ontology features of the appraisal emotion model. The proposed ontological model of lexical concepts and constructions (OMLCC) enables us to formalize in-class categorization of lexical concepts, and metonymic or metaphoric type of constructions. The formalization of the figurative language identification via OMLCC enables us to explicit quantitative data in terms of source frame, target frame ontological properties or type of relation features. The OMLCC model defines the metaphorical mappings as the violation of established meronymic relations between A and B and use of the meronymic network of B to establish new conceptual networks in the emotion event-structure scheme, and enable new types of conceptualizations about an event. It is argued that the qualitative results, represented in a multi-layered network of superimposed layers, reveal the conceptual knowledge of the emotion model.

Besides the explicit procedure of the metaphor identification that can be used for creating language specific metaphor repositories, such as CroMetaNet (www.ihjj.hr/metafore), the OMLCC can be used for building multilingual figurative language repositories that would enable formal cross-cultural research on the figurative language driven conceptualization of emotion.

References

- Barrett Feldman, Lisa. 2011. "Constructing Emotion." *Psychological Topics*. 20: 3, 359-380.
- Barsalou, Lawrence. 2008. "Grounded Cognition." In *Annual Review of Psychology*, 59.
- Bennardo, Giovanni and Victor de Munck 2014. *Cultural Models Genesis, Methods, and Experiences*. New York: Oxford University Press.
- Capra, Frijtof. 1997. *The Web of Life: A New Scientific Understanding of Living Systems*.
- Cruse, Alan. 2004. *Meaning in Language. An Introduction to Semantics and Pragmatics*. Second Edition. New York: Oxford University Press.

- Clayton Philip, and Paul Davies. (eds.) 2006. *The Re-emergence of Emergence. The Emergentist Hypothesis from Science to Religion*. Oxford University Press.
- Damásio, Antonio. [1994] 2005. *Descartes' Error: Emotion, Reason, and the Human Brain*. Penguin.
- D'Andrade, Roy. 1987. "A folk model of the mind." In *Cultural Models in Language and Thought*, edited by Dorothy Holland and Naomi Quinn, 112–148. New York: Cambridge University Press.
- Ellis, Nick C. 2012. "What can we count in language, and what counts in language acquisition, cognition, and use?" In *Frequency effects in language learning and processing*, edited by Stefan Thomas Gries, and Dagmar Divjak. De Gruyter Mouton.
- Fillmore, Charles. 1985. "Frames and the semantics of understanding." *Quaderni di Semantica*. 6: 222–54.
- Fontaine, Johnny R. J., Klaus R. Scherer, and Cristiana Soriano. (eds.) 2013. *Components of emotional meaning: A sourcebook*. Oxford: Oxford University Press.
- Frijda, Nico. 2007. *The Laws of Emotion*. L. Erlbaum Associates.
- Hastings, Janna, Werner Ceusters, Barry Smith, and Kevin Mulligan. 2001. "The Emotion Ontology: Enabling Interdisciplinary Research in the Affective Sciences." In *CONTEXT 2011, LNAI 6967*, edited by Michael Beigl et al., 119–123. Berlin Heidelberg: Springer-Verlag.
- Kövecses, Zoltán. 2000. *Metaphor and Emotion. Language, Culture, and Body in human feeling*. New York: Cambridge.
- Lakoff, George and Johnson, Mark 1999. *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*. New York: Basic Books.
- Langacker, Ronald. 2008. *Cognitive Grammar. An Introduction*. New York: Oxford University Press.
- Nikola Ljubešić and Filip Klubička 2014. "{bs,hr,sr}WaC — Web corpora of Bosnian, Croatian and Serbian." *Proceedings of the 9th Web as Corpus Workshop (WaC-9)*. Gothenburg, Sweden.
- Panksepp, Jaak. 2007. "Affective Consciousness." In *The Blackwell Companion to Consciousness*, edited by Max Velmans, and Susan Schneider. Cambridge, UK: Blackwell Publishing.
- Perak, Benedikt. 2014. *Conceptualization of the lexical concept «strah» 'fear' in Croatian: A syntactic and semantic analysis*. Dissertation. University of Zagreb.
- Perak, Benedikt, and Sanja Puljar D'Alessio. 2013. "Kultura kao emergentno svojstvo otjelovljene spoznaje", in *Avanture kulture:*

- Kulturalni studiji u lokalnom kontekstu*, edited by Nenad Fanuko, and Sanja Puljar D'Alessio, 77-108. Zagreb: Jesenski Turk.
- Russel, James A., and Lisa Feldman Barrett. 1999. "Core Affect, Prototypical Emotional Episodes, and Other Things Called Emotion: Dissecting the Elephant." *Journal of Personality and Social Psychology*.76/5: 805-819.
- Scherer, Klaus R. 2003. "Introduction: Cognitive Components of Emotion." In *Handbook of Affective Sciences*, edited by Richard J. Davidson, Klaus Scherer, and Hill Goldsmith. New York: Oxford University Press.
- Scherer, Klaus R. 2009. "Emotions are emergent processes: they require a dynamic computational architecture." *Philosophical Transaction of the Royal Society*, 364, 3459-34747.
- Scherer, Klaus R. 2013. "Measuring the meaning of emotion words: A domain-specific componential approach." In *Components of emotional meaning: A sourcebook*, edited by Johnny R. J. Fontaine, Klaus R. Scherer, and Cristina Soriano. Oxford: Oxford University Press.
- Sharifian, Farzad. 2015. "Cultural linguistics", in *The Routledge Handbook of Language and Culture*, edited by Farzad Sharifian, 473-492. Routledge.
- Šarić, Ljiljana. 2010. *Rječnik sinonima hrvatskoga jezika*. Wiebke Wittschen.
- Tomasello, Michael. 2003. *Constructing a Language. A Usage-Based Theory of Language Acquisition*. Cambridge, MA: Harvard University Press.