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Special Issue

Breakthroughs into Knowledge Representation and Meaning Construction

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This is the first time that *RaeL* is going to launch a special issue since it was created in 2002.Turning 18 years old means coming of age. This journal has already reached the quality and seniority standards to take a step forward and offer an additional issue in an area of maximum relevance in contemporary linguistics. At the same time, there is an increasing tendency in many prestigious journals all over the world to promote special issues devoted to specific topics in order to offer an updated state-of-art in key areas of research to the scientific community. The **eight** articles that have been selected for this special edition share a common goal to introduce new **breakthroughs into knowledge representation and meaning construction.** They also exemplify the integration and cooperation between linguistics and other disciplines such as Natural Language Processing (NLP), computer sciences, coastal or aeronautic engineering, and new developments in some branches of applied linguistics, which may be particularly relevant in the area of meaning construction introduced below. The selected articles are equally representative of leading research teams, both in Spain and beyond, who have contributed with innovative results from current research projects funded by regional, national and international R & D Offices and Institutions.

The first three articles deal with investigations that have been carried out within the framework of the multipurpose lexico-conceptual knowledge base for NLP, FunGramKB, which has mainly been developed over the last 15 years by Periñán-Pascual & Mairal-Usón (Periñán-Pascual & Arcas-Túnez, 2004, 2007, 2010, 2014; Mairal Usón & Periñán-Pascual, 2009, 2016; Periñán-Pascual & Mairal Usón, 2009; Periñán-Pascual, 2012, 2013; Mairal Usón 2017) and that interested readers can visit on www.fungramkb.com. Within this knowledge base, a key application grounded on Role and Reference Grammar as its linguistic model is ARTEMIS (**A**utomatically **R**epresenting **TE**xt **M**eaning via an **I**nterlingua-based **S**ystem), which is able to generate a full-fledged logical structure of a sentence to be used in NLP applications requiring language comprehension capabilities. Another key role is played by COREL (**COnceptual RE**presentational **L**anguage), the machine-readable metalanguage deployed by FunGramKB to describe the conceptual level in this knowledge base.

To start with, in their contribution, **"Clausal Arguments and Peripheries in ASD-STE100: The Parsing of Subordination in ARTEMIS", María Auxiliadora Martín Díaz and Marta María González Orta** provide an overview of the latest investigations that have been carried out in the development of the computer application ARTEMIS and focus on the simulation of natural language understanding. A fundamental component of ARTEMIS is the GDE (Grammar Development Environment) module, where feature-based production rules and AVMs (Attribute-Value Matrixes) are stored to allow the generation of natural language expressions. In this contribution they delve into some types of complex structures, which may contribute to the enhancement of parsing rules for clausal subordination in ARTEMIS. Bearing in mind the validation process these production rules should undergo, as well as the common problems that may arise in such parsing applications, their research concentrates, precisely, on the analysis of the subordinate structures found in a CNL (Controlled Natural Language) like ASD-STE100. In the same vein, **Ana Díaz Galán and María del Carmen Fumero Pérez** take a step forward in their article entitled **"An Account of Constructions in ASD-STE100: Formalizing Non-Propositional Meaning in Aviation Instructional Texts"**. They address the issue of the formalization of constructional meaning by providing a description of the role that constructional structures play in the controlled language ASD-STE100. Based on a corpus of instructional texts written in this language, they assess the existence in these texts of the four levels of constructional meaning described by the Lexical Constructional Model (Ruiz de Mendoza & Mairal-Usón, 2008; Mairal-Usón & Ruiz de Mendoza, 2009) which, in turn, shape the Grammaticon in the FunGramKB knowledge base (Periñán-Pascual, 2013; Periñán-Pascual & Arcas-Túnez, 2014). They prove that the technical nature of the controlled language has direct influence on the type of constructions employed, making some of the constructional levels irrelevant. A useful outcome of their research is the formalized account of the main types of constructions encountered. To conclude this section, **Rocío Jiménez Briones and Alba Lozondo Oyón** intend to advance in a crucial issue for the development of the LCM (Lexical Constructional Model): "**Illocutionary Meaning in a Knowledge Base: The Case of Requests".** Here, the authors explain how FunGramKB stores and represents illocutionary constructions such as requests that employ the metalanguage known as COREL. They put forward two ways of making meaning, i.e. coded constructions and inferred representations (e.g. *This movie is boring*). In coded constructions such as *Can you X?, Will you X?*, etc., which have focused attention, illocutionary force has been argued to be stably associated with their form (cf. Ruiz de Mendoza & Baicchi, 2007; Ruiz de Mendoza & Galera, 2014). After discussing how such configurations have been analyzed by other authors, Jiménez and Luzondo have proposed a simplified generic structure for coded requestive constructions on the basis of which four constructional domains have been codified via COREL in the Grammaticon of FunGramKB, which, in its turn, is based on the LCM constructionist model. Their contribution might provide additional evidence that Construction Grammar, which lies at the basis of the FunGramKB Grammaticon, is a fruitful avenue for the complex issue of the codification and recognition of human intention.

The following two papers in this special issue present new insights in Cognitive Semantics, a well-known yet extremely fertile branch in contemporary linguistics since the publication of the pioneering work "Metaphors We Live-by" by George Lakoff and Mark Johnson in 1980. The contribution of **Inna Skrynnikova** entitled "**Metaphor Co-Creation in Reframing Cybersecurity Issues"** sheds light on the explanatory and interpretative potential of analogical reasoning in resolving the ambiguity of defining cybersecurity. By applying cognitive and corpus linguistics methods, she describes how the metaphor co-creation strategy may be helpful in reframing the cybersecurity discourse dominated by inapt metaphors, which provoke wrong inferences and ultimately result in false decisions about the nature of cyber-vulnerabilities. An additional insight incorporates the comparison of the conversational valence introduced by professional audience and laymen, revealing how the cybersecurity discourse is channeled in real terms. On the other hand, **Mahum Hayat Khan** presents a topic which has received a limited attention so far: the role of conceptual complexes. She offers examples from the languages of two historically connected countries which nevertheless differ significantly in their economic development: Britain and Pakistan. Consequently, in her article "**A cross-linguistic analysis of conceptual complexes in the domain of economics"**, she emphasizes the relevance of the relationship between metaphor and culture, especially due to the impact of globalisation on our everyday living and the pervasive role of economics in the building of metaphors. Consequently, the selected conceptual complexes have been analysed both in Urdu and English. The analysis has proved the intricacies of conceptual material in the field of economics in cross-linguistic terms and the descriptive and explanatory adequacy of the account of conceptual complexes.

The following contribution is the practical application of Frame-based Terminology (Faber, 2012): a cognitive approach to terminology developed by Pamela Faber and colleagues at the University of Granada. One of its basic premises is that the conceptualization of any specialized domain is goal-oriented, and depends, to a certain degree, on the task to be accomplished. Along these lines, this research group has built EcoLexicon, a terminological knowledge base on environmental science whose design permits the geographic contextualization of data. Consequently, **Juan Rojas García** in the paper entitled "**Application of Topic Modelling for the Construction of Semantic Frames for Named Rivers**" presents a semi-automatic method of extracting terms associated with named rivers (e.g., *Salinas River*). Terms were extracted from a specialized corpus on Coastal Engineering where named rivers were automatically identified. Statistical procedures were applied for selecting both terms and rivers in distributional semantic models to construct the conceptual structures underlying the usage of named rivers. The rivers sharing associated terms were also clustered and represented in the same conceptual network. The results showed that the method was able to describe the semantic frames of named rivers with explanatory adequacy, according to the premises of Frame-based Terminology. Furthermore, the semantic networks unveiled that the named rivers were thematically connected to diverse related phenomena.

Pilar Guerrero Medina in her article **"The distribution of verbs and verb classes in the English *for*-dative alternation: a lexico-paradigmatic approach"** covers a completely different area of research and tries to shed new light on an old linguistic debate about dative

and benefactive alternation. To that purpose, she has analyzed the semantics of *for*-ditransitives against the background of the debate between projectionist and constructionist accounts of syntactic alternations and, at the same time, has tried to show that an alternation-based methodology can be used to explore the semantics of the benefactive construction and of the verb classes that are compatible with it. Revisiting the topic of the English *for*-dative alternation, she concludes that alternations can indeed serve as a heuristic to identify verb meanings and to interpret the semantic difference between *for*-ditransitives and *to*-ditransitives, associated with different verb classes and showing different passivization possibilities, in spite of their "shared surface form".

The final contribution to this special issue includes one of the hottest topics at the interface between Linguistics and NLP: "**Knowledge-based rules for the extraction of complex, fine-grained locative references from tweets"**, submitted by **Nicolás José Fernández Martínez and Carlos Periñán Pascual.** The automatic analysis of user-generated text content from social media involves the challenge of extracting the locative references mentioned in microtexts, so that their geographic coordinates can be identified and the locations can be pinpointed on a map in geolocation systems. The main goal of these two authors was to describe how such locative references can be automatically detected by the knowledge-based rules in LORE, a proof-of-concept application that exploits linguistic knowledge together with NLP techniques for locative extraction in microtexts, ranging from geopolitical entities and natural landforms to points of interest and traffic ways, from English and Spanish tweets.

We would like to finish by thanking the *Revista Electrónica de Lingüística Aplicada* and her Editor-in-Chief, Marian Amengual Pizarro, for giving us the opportunity to publish this special edition for the first time in almost 20 years and, at the same time, we would like to show our appreciation to both the authors of this volume for the rich linguistic discussions they have offered in their outstanding contributions, and the reviewers for the detailed and meticulous work deployed to improve the final versions.

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