**Bolognesi, M., Brdar, M., Despot, K. (eds.) (2019). *Metaphor and Metonymy in the Digital Age. Theory and methods for building repositories of figurative language*. John Benjamins (Metaphor in Language, Cognition, and Communication 8).**

Finding metaphors ‘in the wild’ has become an essential and inescapable task for researchers who deal with figuration, be it for the purpose of qualitative or quantitative description of metaphor in use, or to devise stimuli for experimental research. With their edited volume, “Metaphor and Metonymy in the Digital Age”, Bolognesi, Brdar, and Despot provide an excellent overview of resources to conduct empirical research on metaphors or metonymies by mapping and critically discussing a wide range of digital repositories available for researchers. Earlier versions of the contributions were presented at the *Building Figurative Language Repositories: Methods, Risks, and Challenges* conference held in Zagreb in 2016, organised by one of the volume’s editors, Kristina Despot. The resources discussed feature linguistic as well as pictorial data that can be used to study figurative language in naturally occurring data. The book is interdisciplinary including research from the fields of Cognitive Linguistics, psychology, and computational science. All projects included in the book share the main underlying assumption commonly held in Cognitive Linguistics, i.e. that metaphor and metonymy are essential processes for human cognition, and therefore figurative expressions in language are assumed to reflect underlying patterns in thought.

The contributions are divided into two parts: *Part I. New methods and digital resources for mining metaphor and metonymy in thought, language, and images*, comprising 5 chapters; and *Part II. Reflecting on the risks and challenges involved in building and using repositories of figurative language*, comprising 4 chapters. The purpose of the book is thus not only to provide an overview of available metaphor and metonymy repositories but also to illustrate the methods employed in the creation and use of these repositories, as well as to critically assess how these repositories were created and how they can be used in the study of metaphor and metonymy.

In the **Introduction**, *Fantastic metaphors and where to find them* (pp. 1-19), Marianna Bolognesi and Kristina Despot introduce the volume’s endeavour with a metaphorical comparison. Alluding to the movie *Fantastic Beasts and Where to Find Them*, Bolognesi and Despot compare language repositories to zoos. Like zoos, figurative languages repositories provide a means for studying the diversity of figurative expressions in natural contexts. The chapter presents a brief overview of existing repositories such as the *Master Metaphor List* (Lakoff et al., 1991), the first database for conceptual metaphor, and the VU Amsterdam Metaphor Corpus (Steen et al., 2010), the largest available corpus annotated for metaphorical expressions to date, as well as smaller and more specific resources (e.g. Barnden, 1997; Pasanek, 2015; or Cardillo et al., 2010). The Introduction also provides an overview of the electronic repositories that are discussed as well as detailed summaries of the individual contributions.

**Chapter 1**, *MetaNet: Automated metaphor identification across languages and domains* (pp. 23-47), by Eve Sweetser, Oana David, and Elise Stickles opens Part I of the volume by introducing the MetaNet. The MetaNet project presents a cross-linguistic resource for English, Spanish, Farsi, and Russian to study the use and function of metaphor for the linguistic framing of socio-political issues. As opposed to non-domain-specific natural language processing tools for figurative language (e.g. Mason, 2004), MetaNet was created as a resource for studying specific target domains. The chapter contains a brief description of the MetaNet architecture, focusing on the importance of specific grammatical constructions as well as inheritance relations between general and more specific instances of metaphors for the automated detection of metaphor. The chapter includes a case study on taxation demonstrating the usefulness of MetaNet for cross-cultural metaphor comparison by reporting frequency distributions for the different source domains used to construe taxation metaphorically in English, Spanish, Farsi, and Russian. Finally, shortcomings are discussed such as the fact that MetaNet is only able to automatically detect instances in the corpus where both source and target domain (e.g. *taxation* and *burden*) are explicitly expressed as well as the current failure of the algorithm to detect metonymy (despite the important role of metonymy e.g. in indirectly evoking the target of a metaphorical comparison).

In **Chapter 2**, Antonio Barcelona introduces the Córdoba Metonymy Database. This is a first of its kind tool to focus on metonymy, and therefore, an ideal candidate to complement other repositories with a stronger focus on metaphor, such as Metanet or Croatian Metanet.HR. In the first half of the chapter, Barcelona describes the 11 analytical fields that make up the model for constructing the database, including conceptual labels, degrees of conventionality and patterns of interaction (to mention but a few). Besides this fine-grained annotation system, another strength of the database is that it allows researchers to investigate and compare authentic examples of metonymies in English, Spanish and Spanish Sign Language (although most entries are in English to date). A particularly interesting contribution of the chapter is the discussion of the challenges encountered to define the annotation criteria for the category *Generic Level*, which involves annotating the metonymic patterns as reflecting either apart for whole, whole for part, or part for part metonymy. While traditionally, metonymies have been classified following this tripartite distinction, the author argues that it presents some challenges in the annotation of examples and therefore devotes the second half of the chapter to argue in favour of a more parsimonious approach by reducing it to a binary model (part for whole, whole for part metonymies only).

In **Chapter 3**, *Metaphor in the age of mechanical production (Or: Turning potential metaphors into deliberate metaphors)* (pp. 75-98), Tony Veale illustrates how web data can be used for the automatic generation of metaphorical expressions. The procedure is based on the assumption that existing metaphors can be viewed as a resource for the production of new (and deliberate) metaphors, and that metaphors work by exploitation of stereotypical properties of source and target domains. Veale demonstrates how these stereotypical properties can be mined from the Web via typical collocations found in Google N-grams (particularly 3-grams such as *a lonesome Cowboy*). Via these N-grams, a noun is associated with salient descriptors (in that case *Cowboy* gets associated with *lonesome*). Furthermore, descriptors are extended by lexical items of the same word class that are frequently coordinated with it (e.g. *lonesome and sad*). Finally, descriptors are assigned a polarity. Based on this algorithm, a lexicon of affective stereotypes is created, which in turn is used to automatically create novel metaphors. An empirical evaluation reveals that 75% of the generated metaphors were rated as medium high to very high in comprehensibility and novelty by humans. The chapter concludes with a brief presentation of the web service Metaphor Magnet which generates deliberate metaphors from query items entered by users.

**Chapter 4** provides the first incursion into the world of multimodality. In *VisMet and the crowd: What social tagging reveals about visual metaphors* (pp. 99-121), Marianna Bolognesi, Benjamin Timmermans, and Lora Aroyo focus on crowdsourced tags, i.e. user-generated keywords that users attach to images in online picture databases in order to describe the pictures’ meaning. The innovation of this chapter lies in the assumption behind the meaning of these semantic tags: the authors argue that people’s tagging reveals something about conceptual domains and cognitive operations involved in understanding the visual metaphor, and therefore constitute an excellent (yet underexplored) resource to investigate people’s understanding of visual metaphor. To test this assumption, the authors devised an experiment in which they asked random viewers to tag 10 images that contained multimodal metaphors (featured in the Vismet corpus, a digital resource annotated for visual metaphors, see Bolognesi et al., 2018) which were displayed on screen for shorter periods of time (1 and 5 seconds) and longer periods (10 and 20 seconds). They found that shorter exposure times were likely to produce tags that referred to context (not present in the image) whereas longer exposure times were more likely to lead to tags referring to concrete elements depicted in the image. The authors argue that the main implication of this finding is that the integration of missing information happens before viewers notice other, more concrete elements necessary to unpack the metaphorical meaning of an image.

In **Chapter 5**, *MetaNet.HR: Croatian metaphor repository* (pp. 123-146), Kristina Despot, Mirjana Tonković, Mario Essert, Mario Brdar, Benedikt Perak, Ana Ostroški Anić, Bruno Nahod, and Ivan Pandžić describe the creation of the MetaNet.HR project. The project is devised in a similar fashion as its English-American counterpart MetaNet (see chapter 1) but unlike MetaNet no algorithm for automatic metaphor detection has been developed until now. The hierarchically-organised database of MetaNet.HR was constructed in a top-down approach and contains conceptual metaphors (classified into larger pre-defined families such as Event Structure metaphors, see Lakoff, 1993), image schemas, cognitive primitives, and semantic frames. Each of these elements receives a number of more specific (manual) annotations. The database includes linguistic examples based on the bottom-up analysis of metaphorical expressions extracted from the Croatian Web corpus. The authors reflect on risks and challenges of the project (such as linguistic metaphor identification and conceptual metaphor classification), and report on strategies employed in resolving these.

**Part II** of the book focuses on challenges relating to working with metaphor and metonymy databases. The first contribution in this part is **Chapter 6**, *The lexical vs. corpus-based method in the study of metaphors* (pp. 149-173), in which Zoltán Kövecses, Laura Ambrus, Dániel Hegedüs, Ren Imai, and Anna Sobczak compare a corpus-based approach to the study of metaphor and metonymy with a more intuition-based, introspective approach. Since the advent of Conceptual Metaphor Theory, conceptual metaphor and metonymy have traditionally been studied based on intuition. This approach has been criticised for its lack of reliability and methodological rigor, and more systematic corpus-based approaches have emerged in response (e.g. Deignan, 2005, or Stefanowitsch & Gries, 2006). In contrast to this, in the present chapter, Kövecses et al. highlight advantages of the traditional approach, presenting an updated version of this approach called “lexical approach”, in which information about the potentially figurative use of a target concept is obtained from lexical resources (e.g. dictionaries). The lexical approach is applied to the target concept of surprise (based on Kövecses, 2015), and findings are compared to a corpus-based study of 2,000 randomly retrieved concordance lines of *surprise* from COCA (The Corpus of Contemporary American English, Davies, 2008-). The comparison reveals, for example, that the corpus-based approach makes it possible to identify a broader range of metaphorical expressions for a given target concept and to obtain frequency data, while the lexical approach can identify metaphorical expressions that do not explicitly contain a target domain item, showing that introspective analysis can successfully complement more quantitatively-oriented corpus analysis.

In **Chapter 7**, *Figurative reasoning in hedged performatives* (pp. 175-198), Klaus-Uwe Panther and Linda L. Thornburg present a pragmatic perspective on figurative language focusing on metonymic inferences. The chapter focuses on hedged performatives (e.g. “I can offer you a five year contract”) which despite of the modal hedge *can* are traditionally regarded as offers. The insightful selection of examples and the clear explanations complemented by graphical summaries support the main thesis underlying this chapter: speech acts are synergic acts of meaning, were the sum of the different parts (that is, what is explicitly stated) is not equal to the overall meaning, which is rather achieved through inferencing. By arguing that the pragmatic interpretation of speech acts is not compositionally computable, and must be undertaken through human inferencing, the authors present an interesting counter proposal to other contributions in this volume (see e.g. Veale) that explore new avenues of research into the machine annotation and processing of figurative meaning.

In **Chapter 8**, *Mereology in the Flesh* (pp. 199-224), Simon Devylder presents a nuanced typology for the study of concepts like parts, wholes, and their relation, which is intended to improve manual annotation of potentially metonymic expressions and their hierarchical organisation. Devylder gives a variety of illustrative examples from languages all over the world to show that conflations at the linguistic level regarding the expressions of part-whole relations should not be confused at the conceptual, and thus analytical level. While, for example, in English, the expression *a part of* can both be used to denote meronymic relations (e.g. “the arm is part of the body”) and taxonomic relations (e.g. “a car is part of the category of vehicles”), this is not the case for many other languages. Devylder discusses several of such conflations and proposes tests and criteria on how to keep them analytically distinct. Furthermore, Devylder also proposes that, ontologically, there are two different kinds of wholes: componential wholes, which are made up of parts, and more holistically construed Gestalt wholes (see Talmy, 1988). He shows how this distinction can explain diverging usage patterns of separation events expressed, for example, by the verbs *break* or *cut*.

In the final chapter, **Chapter 9**, *Metaphor repositories and cross-linguistic comparison: Ontological eggs and chickens* (pp. 225-252), Mario Brdar, Rita Brdar-Szabó, and Benedkit Perak discuss the applicability of metaphor repositories for cross-linguistic studies, a topic that is also addressed by many of the chapters in the volume. The authors shed light on the concept of *ontologies* in metaphor research, which is a concept that proves to be useful to bridge existent gaps between repositories of metaphors in different languages. Through the analysis of two case studies (metaphors for the medical transplantation of organs in English, French, Croatian, and Hungarian; and time metaphors in Croatian, Hungarian, and English), they show that languages frequently diverge at more specific levels of metaphor instantiation, which would hinder the proper cross-linguistic comparison of metaphorical expressions for the same domains. The authors introduce the *Ontology Model of Lexical Concepts and Constructions* (consisting of 16 emergent properties) designed to classify concepts contained within metaphorical expressions in different languages, to then draw specific crosslinguistic connections among them (rather than linking metaphorical domains, they have to do with emergent conceptual structure and embodied knowledge of the world). This model is perfectly compatible with other contributions in this volume since its goal is to add granularity to the crosslinguistic comparison of figurative expressions in repositories.

Overall, the volume provides a well-achieved balance between different approaches to the study of figurative language (cognitive linguistic, functional, and pragmatic), types of processes (metaphor, metonymy) and data (verbal and multimodal). The chapters are also varied in their profile, as there are excellent cases of qualitative analysis of metaphor and metonymy, methodological discussion, and quantitative experiments, all supported with authentic data – thus endorsing the volume with ecological validity. The volume promises to be a useful guide for both experienced and early career researchers interested in studying metaphor and metonymy from both a qualitative as well as a quantitative perspective. Furthermore, it also provides insightful and balanced discussions on the different approaches (linguistic, cognitive, pragmatic, computational) to study metaphor and metonymy in the wild thereby addressing a wide readership as well as increasing the relevance of this volume. Although the contributions differ in their style and degree of background knowledge required to unpack their contents, the volume successfully moves the state of the art forward by drawing attention to the vast potential offered by figurative databases, which ultimately may facilitate automatic metaphor and metonymy detection, interpretation, and even creation, but which also present ideal means (or zoos) for the qualitative study of metaphor and metonymy in their natural habitat. Findings from such studies using figurative language databases may be applied to various fields such as education, clinical and therapeutical discourse, political discourse, AI, computational creativity, and creative writing.

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