A 'Wind of Change' – Shaping Public Opinion of the Arab Spring Using Metaphors

Alexandra Núñez[†], Malte Gerloff[‡], Erik-Lân Do Dinh[§],
Andrea Rapp[†], Petra Gehring[‡], Iryna Gurevych[§]
[†]Institut für Sprach- und Literaturwissenschaft, TU Darmstadt
[‡]Institut für Philosophie, TU Darmstadt
[§]UKP Lab, TU Darmstadt

Abstract

Newspapers create publicity, draw attention to topics, and try to gain thematic acceptance from the reader. To achieve this, they use linguistic strategies and select culturally and historically evolved encyclopedic knowledge sources. In our pilot study we explore the presentation of the events in the Middle-East-North-African region between December 2010 and November 2011 that were soon metaphorically framed as the *Arab Spring*. To this end, we use a text corpus consisting of 300 opinion pieces from five national German newspapers.

To get access to the conceptual knowledge structure and the linguistic strategies we combine text mining methods and cognitive linguistics. We focus on conceptual metaphors (Lakoff and Johnson, 1980) and their binary source-target structure, where the source domain reveals the underlying conceptual knowledge structures of the speaker. This research focus is justified by the omnipresence of political abstract nouns and by the consistency of metaphors—in particular, genitive metaphor constructions—within the corpus. We first annotate parts of our corpus for such metaphors. Then, additional genitive metaphors are automatically extracted using an adapted metaphor detection system. Finally, we use a clustering algorithm to group the metaphors by source domain. In the following manual cluster analysis, we show that conceptual metaphors are being used throughout the corpus in a systematic way to implicitly categorize and assess the Arab Spring.

Motivation

We are guided by a central question: How does the mass media, particularly through its choice of metaphors in opinion pieces, affect the way we think about controversial topics such as the Arab Spring?

Adopting the premise that mass media organizes (Couldry, 2010) and shapes social reality (Luhmann, 1996), we use a corpus-based and sociocultural-cognitive framework (Verschueren, 2012; Chilton, 2005) to approach our questions, supported by text mining methods. We investigate how metaphor use construes meaning in German media discourse[1] and focus on its intertextual and discursive entrenchment (Schmid 2015, 2018) as conceptual construals in public. To this end, we analyze how metaphors in German newspaper opinion pieces (Möller, 2014; Núñez, 2014) narrow the perspective on the political events in the Middle-East-North-African region (December 2010–November 2011), framed as the *Arab Spring*. We specifically choose to analyze opinion pieces because they provide linguistically constructed models of reality for a wide audience (Ramge and Schuster, 2001).

According to the Conceptual Metaphor Theory (Lakoff and Johnson, 1980), metaphors are ubiquitous and constitute a binary source-target domain mapping. An example is the conceptual metaphor POLITICAL VALUES/CHANGE ARE NATURAL ELEMENTS (see Fig. 6). Representations on the text surface (*linguistic metaphors*) include, e.g. *wind of change*, where a source domain *wind* is mapped to a target domain *change* through the genitive construction, or likewise, *wave* (source) *of self-liberation* (target).

Metaphors not only enrich texts with semantic meaning but rather evoke a complex system of implicative and culture-specific knowledge of a speech community. Therefore, they are a constitutive part of cultural models[2] (Quinn and Holland, 1987; Dirven et. al., 2007a) and ideologies[3] (Dirven et al., 2007b; Dirven et al., 2003; Semino, 2008). The choice of source domains illustrates which conventionalized knowledge is required to understand and conceptualize new or abstract (target) domains in terms of our cultural imprints (source domain).

The Arab Spring is particularly interesting because it happened outside of the western cultural space and because the German media utilized analogies and background knowledge for an understanding of those political events (Girnth and Spieß, 2006). The usage of certain metaphors implies a preceding information selection process, which can be a part of ideological and hegemonic discourse strategies of the discourse agents (i.e. the media). Verschueren (2012: 23) points out that only those linguistic phenomena should be considered as ideological which 'emerge coherently from data, both in terms of conceptual connectedness with other aspects of meaning and in terms of pattern of recurrence or absence.' We delineate the persuasive and argumentative function of discourse specific metaphors as 'intertextual key framing device[s]' (Zinken et al., 2008: 363), which implicitly influence the reader to welcome the events by evoking collectively shared values, shared knowledge, and cultural models.

To quantitatively assess metaphoric usage, we build a pipeline that automatically detects (and filters) metaphors appearing in genitive constructions, before clustering them by presumed source domains. The binary genitive construction type (X [NN] [ART] Y [NN]) provides direct access to the metaphorical mappings. Moreover, this construction type is subject to semantic and directional constraints. The first component (X) is prototypically

filled by a noun which represents the source domain. Focusing on the genitive construction type therefore allows for an easy clustering of source domains.

In summary, we exemplify how the political events are categorized and assessed by using genitive metaphors. To ensure a bottom-up approach, we use automatic metaphor detection and clustering, thus considering both linguistic and conceptual metaphors.

Corpus and Annotation

To analyze how opinion pieces shape views by using metaphors, we utilize a corpus of 300 manually collected opinion pieces from five national German newspapers: *Frankfurter Rundschau, Die ZEIT, Der Spiegel, taz,* and *Die Welt* (Núñez, 2012). The corpus was constructed with regards to hermeneutical criteria and abductive reasoning by manually searching for the keywords *Revolution**, *Demokratie**, and *arabisch* Frühling* in the database LexisNexis[4].

Sentences	Tokens	Genitive constructions	Annotated constructions	Detected metaphors
19,806	391,215	2,758	492	150

Table 1. Corpus Information. Number of genitive constructions of the form (X [NN] [ART] Y [NN]), number of annotated constructions (on which the annotators agreed), and number of automatically detected metaphors.

We use WebAnno[5] to annotate genitive constructions like *wave of revolutions* in nine opinion pieces. Initially, we used three classes for annotation: novel metaphor, ubiquitous metaphor, literal use. As novel, we denote those metaphors which are rarely used or otherwise stand out, i.e. those that create a contextual break and disrupt textual expectations (Gehring, 2010). As ubiquitous, we label metaphors which are common, or can be expected, in the present discourse context. We merged these two classes in an adjudication step. The difficulty of the task is highlighted by a modest inter-annotator agreement of 0.45 Krippendorff's alpha. Common sources of disagreement were, e.g. metonymic relations such as *Versorgung des Landes* (*supply of the country*), personifications like *Selbstbewusstsein einer Generation* (*self-consciousness of a generation*), or metaphors that need a larger context to function. For training and evaluation, we only use those annotations on which both annotators agree (see Table 1: Annotated constructions).

Automatic Metaphor Detection and Clustering

To examine our question quantitatively, we first detect genitive metaphors automatically, before clustering them into source domains (see Fig. 1). For detection, we use the random forest approach of Tsvetkov (2014), which is firmly rooted in conceptual metaphor theory. It mainly uses features extracted from manually crafted resources such as an abstractness word list and supersenses to classify adjective-noun and subject-verb-object constructions. For use on other languages than English, a bilingual dictionary is required. We manually expand an existing dictionary[6] to cover our corpus and extend their system to enable classification of genitive constructions.
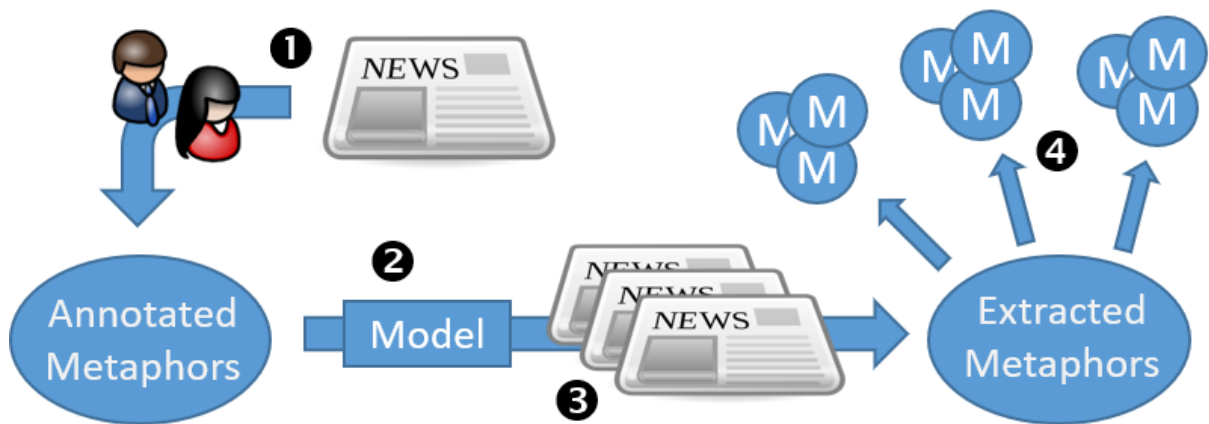
Figure 1. Annotation and Detection Process. (1) A random selection of opinion pieces is manually annotated. (2) The obtained metaphors are used to learn different models (Tsvetkov, 2014; Do Dinh and Gurevych, 2016). (3) We choose the former, better performing model, to detect metaphors from the remaining opinion pieces, and (4) subsequently cluster the detected metaphors.

To gain further insight into the usage of metaphors in our corpus, we cluster the detected metaphors—more specifically, their first component—into coarse grained semantic fields. While some works use a theory-supported top-down approach (e.g. using source domain lists (Gordon et al., 2015)), we opt for an unsupervised approach without preselecting the number of clusters or manually fixing cluster centers (similar to Shutova et al. (2010), who use spectral clustering for metaphor detection). To this end, we employ Affinity Propagation (Frey and Dueck, 2007), which we supply with cosine similarities between pre-trained word embeddings[7] of pairs of metaphor components. Further, in contrast to Gordon et al. (2015), we deliberately forego building an abstraction layer on the clusters, keeping with a bottom-up method which warrants staying on the surface of the text.

Discussion

We use cross-validation for the intrinsic evaluation of the metaphor detection part: the system achieves a precision of 0.63, a recall of 0.25, and an F1-score of 0.35. In the following, we analyze errors using the example clusters *Fall* (*fall*, see Fig. 4) and *Zusammenbruch* (*collapse*, see Fig. 5). Both contain detection errors, e.g. *Falle eines erzwungene Rücktritts*, and *Zusammenbruch der Berliner Mauer*. Many of these errors can be traced back to the translation step: the dictionary translates *Falle* to *trap*, instead of the contextually fitting *case*; *Zusammenbruch* is translated as *bankruptcy*. These errors could possibly be resolved by making use of multiple translations (e.g. in a majority vote setting) or by using an alternative system which is less language-dependent. To test the latter, we conducted preliminary experiments with a multi-layer perceptron (similar to Do Dinh and Gurevych, 2016). However, as expected, the small amount of training data led to an overall worse performance. Another source of errors are named entities; while they are filtered before clustering, their automatic recognition is not fully reliable.

Finally, errors can occur during the clustering process. The example clusters have very similar meanings and should arguably be grouped together. However, caused by our choice of

word embeddings, the cluster centers *Zusammenbruch* and *Fall* exhibit only a small similarity. To better model polysemy, one approach could be to utilize sense embeddings instead, and incorporate all senses of a word into the clustering step.

POLITICAL VALUES/CHANGE ARE NATURAL ELEMENTS, cluster: Wind (wind)
Welle des Aufbegehrens (*wave of protest*), Welle der Gewalt (*wave of violence*), Welle der Rückbesinnung (*wave of recentering*), Welle und Zugeständnissen der Regierung, Welle des erfolgreichen Protests, Welle der Volkserhebungen (*wave of popular uprising*), Welle der Selbstbefreiung (*wave of self-liberation*), Wind der Freiheit (*wind of freedom*), Wind der Revolution (*wind of revolution*), Wind des Wandels (*wind of change*)

Figure 2. Cluster with center Wind (wind).

POLITICAL SYSTEMS ARE OBJECTS/BUILDINGS, cluster: Fall (fall)
Falle eines erzwungenen Rücktritts, Opfer des alten Regimes, Fall des tunesischen Diktators, Fall der repressiven arabischen Regierungen, Fall der arabischen Mauer (*fall of the Arab wall*), Fall der Mauer, Fall der Berliner Mauer (*fall of the Berlin wall*)

Figure 3. Cluster with center Fall (fall).

POLITICAL SYSTEMS ARE OBJECTS/BUILDINGS, cluster: Zusammenbruch (collapse)
Sturz des Diktators (*toppling of the dictator*), Sturz des Regimes (*toppling of the regime*), Sturz des Assad-Regimes, Sturz eines Tyrannen (*toppling of a tyrant*), Sturz des Diktators, Sturz eines Diktators, Sturz des Diktators, Sturz des Diktators, Sturz des alten Regimes, Sturz der Mubarak-Diktatur, Sturz des Diktators, Sturz des Schah-Regimes, Sturz der Diktatur, Sturz des Regimes, Sturz des Regimes, Sturz der Autokraten, Sturz eines scheinbar stabilen autoritären Regimes, Sturz des Schahs, Sturz eines Präsidenten, Sturz der Präsidenten, Sturz der Monarchie, Sturz der mafiosen Systeme, Sturz seines Diktators, Sturz des Diktators, Profiteure des Regimes, Zusammenbruch der Berliner Mauer, Zusammenbruch der Gewissheiten (*collapse of certainties*), Zusammenbruch des Regimes (*collapse of the regime*)

Figure 4. Cluster with center Zusammenbruch (collapse).

POLITICAL SYSTEMS ARE PHYSICAL BALANCES STRUCTURES/OBJECTS, cluster: Stabilität (stability)
Druck des Aufstands, Lage der Militärs, Öffnung des verkrusteten Regimes, Stabilität des Nahen Ostens (*stability of the Middle East*), Stabilität der gesamten Region, Stabilität oder Instabilität am östlichen Mittelmeer, Stabilität ihrer Regierung, Stabilität unseres Systems, Stabilität eines Husni Mubarak, Stabilität dieser Regime, Fundamente seiner Herrschaft, Fundament einer stabilen Demokratie

Figure 5. Cluster with center Stabilität (stability).

Despite such errors, we can gather various insights from the clustering results, especially with regard to discursive, constructed interpretations of the events. Further, the clusters offer a good overview of the present intertextual metaphors in the corpus. We observe that they indicate a semantic routinization[8] of linguistic metaphors, which are stabilized by the underlying conceptual systematicity and constraints of the mappings (Kövecses, 2006). The

clusters reveal which selective and collectively shared knowledge (source domain) is used by the discourse agents to understand political, abstract concepts (target domains). We assume that they have a strategic function within 'argumentative reasoning' (Musolff, 2016: 32) because they implicitly guide the reader's' attention and perception in specific directions to gain their acceptance. Following the assumption of Nonhoff (2006) that hegemonic strategies are indicated on the text surface by a predominance of specific ways of speaking, we can observe tendencies of simplified dualistic event interpretations in opinion pieces that are constructed by the use of metaphors. In the following section we more closely discuss some of the discovered clusters and their interrelation.

Conceptual Dynamics versus Stability

The positive properties and the movement character of natural elements (see Fig. 2) such as *wind* and *wave* are mapped to the abstract political and polysemous[9] nouns *freedom, self-liberation, revolution*, or *political change* and they receive a deontic character (Hermanns, 1994). This mapping, POLITICAL VALUES/CHANGE ARE NATURAL ELEMENTS, persuades the reader to welcome the events by evoking familiar values. Most notably the metaphorical mapping of natural elements reduces complexity, interpreting the events as an organic and teleological development. In addition, this conceptual 'naturalization' of political events and thus the implicitly used causality principle points to western expectations. In short: the metaphors imply to the reader that the Arab states become western democratic states. These metaphors impart implicit cultural values that are construed in texts and spread by their use, thus contributing to the extension of a western narrative.

Conceptualizing POLITICAL SYSTEMS or regions as OBJECTS/BUILDINGS (see Fig. 3, Fig. 4) or as PHYSICAL BALANCES STRUCTURES/OBJECTS (see Fig. 5), i.e. as implicitly stable objects (*stability of the Middle East, of the government*), entails the opportunity to let these objects topple (*toppling of dictator, of regime, of tyrant*) or fall (*fall of the Tunisian dictator, fall of the Arab wall, etc.*). Using nouns with a negative connotation such as *dictator* or *tyrant* in combination with *fall* already guide the perception to support the dynamics. In addition, the clustering points out the presence of historical analogies within discourse as well. The collocation *fall of the Arab wall* shows par excellence how culture-specific knowledge of the German history is used to provide an understanding, to evoke collective memory components, thus satisfying the need of cognitive (Kövecses, 2009) and cultural coherence (Assmann, 1992).

Thus, political event representations are construed within binary conceptual spaces as DYNAMICS and STABILITY (see Fig. 6), while the metaphorical collocations indicate the priority of interpretation pattern used by the discourse agents. They tend to be used in the media to cause a dramatic effect and to create a political emotional storyline for the reader.

Conclusion

Our pilot study indicates the presence of cultural conceptualizations and their entrenchment in linguistic metaphors which we exemplified in the discussed metaphor clusters. As part of an idealized cultural model (political change leads to democratization), metaphors are used in

opinion pieces to interpret the Arab Spring in terms of presupposed western and collective knowledge. The extracted generic source domains, e.g. NATURAL ELEMENTS, and their target components which evoke familiar values and beliefs, suggest that a specific network of linguistic and conceptual metaphors is used to construct a culture-based impression of the events. This strategic metaphor use tends to reduce the complexity of political contents and emotionalizes them in order to familiarize the reader with the events.

Our study shows that our bottom-up text mining and clustering approach is effective in providing an explorative impression of the intertextual distributed and entrenched metaphorical genitive constructions.

This research will also benefit the Digital Humanities community by enabling the comparison of thematic corpora using the relationships between their metaphors and the common main cluster as a metric. This approach therefore introduces a new way to analyze conceptual networks used in thematic corpora. Our approach can also facilitate corpus studies and (critical) discourse studies, e.g. by analyzing other discourse segments that deal with the implicit construction of identity and alterity within opinion pieces by using metaphors.
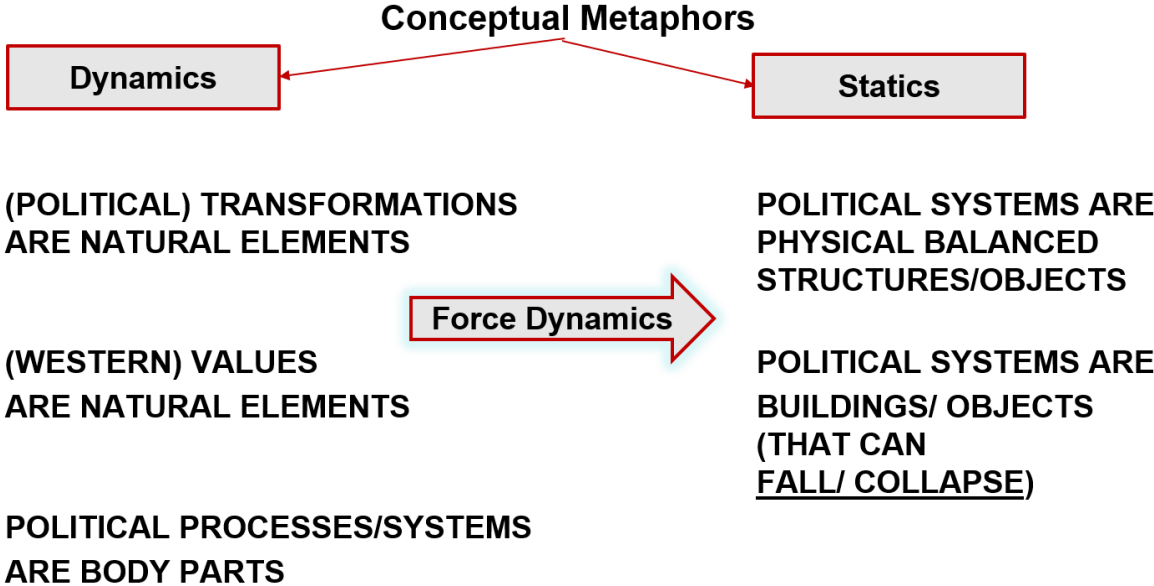
Conceptual Metaphors

Dynamics		Statics

(POLITICAL) TRANSFORMATIONS ARE NATURAL ELEMENTS

POLITICAL SYSTEMS ARE PHYSICAL BALANCED STRUCTURES/OBJECTS

Force Dynamics →

(WESTERN) VALUES ARE NATURAL ELEMENTS

POLITICAL SYSTEMS ARE BUILDINGS/ OBJECTS (THAT CAN FALL/ COLLAPSE)

POLITICAL PROCESSES/SYSTEMS ARE BODY PARTS

Figure 6. Binary conceptual principles in opinion pieces: DYNAMICS versus STABILITY.

Notes

1. There is a wide range of different discourse definitions within Linguistics. We understand 'discourse' as virtual and public conversation about a topic (Musolff 2016; see also Hermanns, 1995).

2. The term 'cultural models' encompasses all kinds of culturally and historically evolved and conventionalized conceptualizations. It includes categories, schemas, and most importantly conceptual metaphors. In short, cultural models comprise all kinds of prototypical knowledge, common places and experiences of a speech community that are intersubjectively shared and embodied in their language (Tomasello 1999; Sharifian 2011).

3. Here, the term 'ideology' is understood in a broad sense as 'a system of beliefs and values based on a set of cognitive models, i.e. mental representations—partly linguistic and partly non-linguistic—of recurrent phenomena and their interpretation in culture and society' (Dirven et al. 2003: 2).

4. We use the online database Lexis Nexis (http://www.lexisnexis.de/). * is a wildcard character used to take into account multiple morphological variants.

5. WebAnno (Yimam et al., 2014) is a web-based annotation tool that allows multiple users to annotate the same document: https://webanno.github.io/webanno/

6. We use and extend the German-English dictionary maintained by Frank Richter: http://ftp.tu-chemnitz.de/pub/Local/urz/ding/de-en/

7. We use word2vec word embeddings trained on multiple German sources (Reimers et al., 2014), including the German Wikipedia and various newspaper corpora: https://www.ukp.tu-darmstadt.de/research/ukp-in-challenges/germeval-2014/

8. We consider the repeated paradigmatic linguistic variation and pragmatic association within the genitive construction type with its respective source or target slot as entrenchment processes. An entrenchment effect is caused by collocating identical or similar linguistic elements in an identical cotextual pattern which can be described as a cognitive process of analogizing.

9. Dieckmann (1975) stresses that political nouns, e.g. *democracy*, entail a polysemous character. He created the term 'ideological polysemy' (Ger. 'Ideologische Polysemie'). Media uses political framing as well as ideologically polysemous nouns to gain acceptance from a wide audience. The polysemous character provides ideological projection surfaces for the readers.

References

Assmann, J. (1992). Das kulturelle Gedächtnis. Schrift, Erinnerung und politische Identität in frühen Hochkulturen. München: Beck.

Chilton, P. (2005) Missing Links in Mainstream CDA: Modules, Blends and the Critical Instinct. In Wodak, R. and Chilton, P. (eds), A New Agenda in (Critical) Discourse Analysis. Amsterdam / Philadelphia: John Benjamins, pp. 19–52.

Couldry, N. (2010). Media Discourse and the Naturalization of Categories. In Wodak, R. and Koller, V. (eds), Handbook of Communication in the Public Sphere. Berlin / New York: Walter de Gruyter, pp. 67–88.

Dieckmann, W. (1975). Sprache in der Politik. Einführung in die Pragmatik und Semantik der politischen Sprache. Heidelberg: Winter.

Dirven, R., Frank, R. M. and Pütz, M. (2003). Categories, Cognitive Models and Ideologies. In Dirven, R., Frank, R. M. and Pütz, M. (eds), Cognitive Models in Language and Thought. Ideology, Metaphors and Meanings. Berlin / New York: De Gruyter, pp. 1–24.

Dirven, R., Wolf, H.-G. and Polzenhagen, F. (2007a). Cognitive Linguistics and Cultural Studies. In Geeraerts, D. and Cuyckens, H. (eds), The Oxford Handbook of Cognitive Linguistics. Oxford: Oxford University Press, pp. 1203–1221.

Dirven, R., Polzenhagen, F. and Wolf, H.-G. (2007b). Cognitive Linguistics, Ideology, and Critical Discourse Analysis. In Geeraerts, D. and Cuyckens, H. (eds), The Oxford Handbook of Cognitive Linguistics. Oxford: Oxford University Press, pp. 1223–1240.

Do Dinh, E. and Gurevych, I. (2016). Token-Level Metaphor Detection using Neural Networks. In Proceedings of the Fourth Workshop on Metaphor in NLP. Stroudsburg: Association for Computational Linguistics, pp. 28–33.

Frey, B. J. and Dueck, D. (2007). Clustering by Passing Messages Between Data Points. Science, 315(5814): 972–976.

Gehring, P. (2010). Erkenntnis durch Metapher? Methodologische Bemerkungen zur Metaphernforschung. In Junge, M. (ed), Metaphern in Wissenskulturen. Wiesbaden: Verlag für Sozialwissenschaften, pp. 203–220.

Girnth, H. and Spieß, C. (2006). Dimensionen öffentlich-politischen Sprachhandelns. In Girnth, H. and Spieß, C. (eds), Strategien politischer Kommunikation. Pragmatische Analysen. Berlin: Erich Schmidt Verlag, pp. 7–16.

Gordon, J., Hobbs, J. R., May, J., Mohler, M., Morbini, F., Rink, B., Tomlinson, M. and Wertheim, S. (2015). A Corpus of Rich Metaphor Annotation. In Proceedings of the Third

Workshop on Metaphor in NLP. Stroudsburg: Association for Computational Linguistics, pp. 56–66.

Hermanns, F. (1994). Schlüssel-, Schlag- und Fahnenwörter; zu Begrifflichkeit und Theorie der lexikalischen „politischen Semantik"; erste Fassung eines Überblicksartikels zum Forschungsstand in Sachen Schlüsselwort- und Schlagworttheorie und -forschung für den Ergebnisband des Teilprojekts C5 des SFB 245. Heidelberg.

Hermanns, F. (1995). Sprachgeschichte als Mentalitätsgeschichte**.** Überlegungen zu Sinn und Form und Gegenstand historischer Semantik. In Gardt, A., Mattheier, K. and Reichmann, O. (eds), Sprachgeschichte des Neuhochdeutschen. Gegenstände, Methoden, Theorien. Tübingen, pp. 69–101.

Kövecses, Z. (2006). Language, Mind, and Culture. A Practical Introduction. Oxford: Oxford University Press.

Kövecses, Z. (2009). Metaphor, Culture, and Discourse: The Pressure of Coherence. New York: Palgrave Macmillan. In Musolff, A. and Zinken, J. (eds), Metaphor and Discourse. London: Palgrave Macmillan, pp. 11–24.

Lakoff, G. and Johnson, M. (1980). Metaphors we live by. Chicago University Press.

Luhmann, N. (1996). Die Realität der Massenmedien. Opladen: Westdeutscher Verlag.

Möller, N. (2014). Cognitive Metaphor and the "Arab spring." In Polzenhagen, F., Kleinke, S., Kövecses, Z. and Vogelbacher, S. (eds), Cognitive Explorations into Metaphor and Metonymy. Frankfurt (Main): Peter Lang, pp. 133–148.

Musolff, A. (2016). Political Metaphor Analysis. Discourse and Scenarios. London: Bloomsbury.

Nonhoff, M. (2006). Politischer Diskurs und Hegemonie. Das Projekt „Soziale Marktwirtschaft." Bielefeld: transcript Verlag.

Núñez, A. (2012). Der Arabische Frühling: Eine korpusbasierte Mediendiskursanalyse. Unpublished magister (equiv. master) thesis. Heidelberg.

Núñez, A. (2014). Wenn das „Embodiment" politisch wird: Das Image-Schema PATH und seine Realisierung im Mediendiskurs zum „Arabischen Frühling". In Polzenhagen, F., Kleinke, S., Kövecses, Z. and Vogelbacher, S. (eds), Cognitive Explorations into Metaphor and Metonymy. Frankfurt (Main): Peter Lang, pp. 149–164.

Quinn, N. and Holland, D. (1987). Culture and Cognition. In Holland, D. and Quinn, N. (eds), Cultural Models in Language and Thought. Cambridge: Cambridge University Press, pp. 3–42.

Ramge, H. and Schuster, B.-M. (2001). Kommunikative Funktionen des Zeitungskommentars. In Leonhard, J.-F., Ludwig, H.-W., Schwarze, D. and Straßner, E. (eds), Medienwissenschaft. Ein Handbuch zur Entwicklung der Medien und Kommunikationsformen. Berlin / New York: Mouton de Gruyter, pp. 1702–1712.

Reimers, N., Eckle-Kohler, J., Schnober, C., Kim, J. and Gurevych, I. (2014). GermEval-2014: Nested Named Entity Recognition with Neural Networks. In Workshop Proceedings of the 12th Edition of the KONVENS Conference. Universitätsverlag Hildesheim, pp. 117–120.

Schmid, H.-J. (2015). A Blueprint of the Entrenchment-and-Conventionalization Model. In Yearbook of the German Cognitive Linguistics Association 3: 1–27.

Schmid, H.-J. (2018). Ein integratives soziokognitives Modell des dynamischen Lexikons. In Engelberg, St., Lobin, H., Steyer, K. and Wolfer, S. (eds), Wortschätze. Dynamik, Muster, Komplexität. Berlin / Boston: Walter de Gruyter, pp. 215–231.

Semino, E. (2008). Metaphor in Discourse. Cambridge: Cambridge University Press.

Sharifian, Farzad (2011). Cultural Conceptualisations and Language. Theoretical Framework and Applications. Amsterdam / Philadelphia: John Benjamins.

Shutova, E., Sun, L. and Korhonen, A. (2010). Metaphor Identification using Verb and Noun Clustering. In Proceedings of the 23rd International Conference on Computational Linguistics. Stroudsburg: Association for Computational Linguistics, pp. 1002–1010.

Tomasello, M. (1999). The Cultural Origins of Human Cognition. Cambridge: Harvard University Press.

Tsvetkov, Y., Boytsov, L., Gershman, A., Nyberg, E. and Dyer, C. (2014). Metaphor Detection with Cross-Lingual Model Transfer. In Proceedings of the 52nd Annual Meeting of the Association for Computational Linguistics. Stroudsburg: Association for Computational Linguistics, pp. 248–258.

Yimam, S. M., Eckart de Castilho, R., Gurevych, I., and Biemann C. (2014). Automatic Annotation Suggestions and Custom Annotation Layers in WebAnno. In Proceedings of the 52nd Annual Meeting of the Association for Computational Linguistics, Demo Session. Stroudsburg: Association for Computational Linguistics, pp. 91–96.

Verschueren, J. (2012). Ideology in Language Use. Pragmatic Guidelines for Empirical Research. Cambridge: Cambridge University Press.

Zinken, J., Hellsten, I. and Nerlich, B. (2008). Discourse Metaphors. In Dirven, R., Frank, R., Ziemke, T. and Zlatev, J. (eds), Body, Language, and Mind. Vol. 2: Sociocultural Situatedness. Berlin / New York: Mouton de Gruyter, pp. 363–385.