



UvA-DARE (Digital Academic Repository)

Metaphor in communication: The distribution of potentially deliberate metaphor across register and word class

Reijnierse, W.G.; Burgers, C.; Krennmayr, T.; Steen, G.J.

DOI

[10.3366/cor.2019.0176](https://doi.org/10.3366/cor.2019.0176)

Publication date

2019

Document Version

Author accepted manuscript

Published in

Corpora

[Link to publication](#)

Citation for published version (APA):

Reijnierse, W. G., Burgers, C., Krennmayr, T., & Steen, G. J. (2019). Metaphor in communication: The distribution of potentially deliberate metaphor across register and word class. *Corpora*, 14(3), 301-326. <https://doi.org/10.3366/cor.2019.0176>

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (<https://dare.uva.nl>)

Metaphor in communication:

The distribution of potentially deliberate metaphor across register and word class

W. Gudrun Reijnerse¹, Christian Burgers², Tina Krennmayr², and Gerard J. Steen¹

¹University of Amsterdam; ²Vrije Universiteit Amsterdam

** Accepted for publication in *Corpora* 14(3) **

Abstract

There is renewed interest in the special role that metaphor can have in its communicative status *as* metaphor between language users. This paper investigates the occurrence of such deliberate metaphors in comparison with non-deliberate metaphors. To this end, a corpus of 24,762 metaphors was analysed for the presence of potentially deliberate (versus non-deliberate) metaphor use across registers and word classes. Results show that 4.36% of metaphors in the corpus are identified as potentially deliberate metaphors. News and fiction contain significantly more potentially deliberate metaphors, while academic texts and conversations exhibit significantly fewer potentially deliberate metaphors than expected. Moreover, nouns and adjectives are used relatively more frequently as potentially deliberate metaphors, while adverbs, verbs, and prepositions are used relatively less frequently as potentially deliberate metaphors. These results can be explained by referring to the overall communicative properties of the registers concerned, as well as to the role of the different word classes in those registers.

Metaphor in communication:

The distribution of potentially deliberate metaphor across register and word class

1. Introduction

Since the 1980s, much linguistic research into metaphor has been inspired and/or influenced by Conceptual Metaphor Theory (henceforth: CMT; Lakoff and Johnson, 1980, 1999; and see Gibbs, 2011, for an overview). According to CMT, metaphors in language are expressions of metaphorical structures in thought. Thus, when saying ‘I have invested a lot of time in this project’, CMT argues that this is the result of a cross-domain mapping in thought between the conceptual domains of MONEY¹ (the source domain) and TIME (the target domain). One of the main claims of CMT that follows from this view of metaphor as a predominantly conceptual device, is that metaphor is not ‘extraordinary’, but rather ‘pervasive in everyday life’ (Lakoff and Johnson, 1980: 3). Studies investigating metaphor in discourse invariably show that metaphor is indeed a ubiquitous phenomenon in language, including in classroom discourse (e.g., Cameron, 2003), financial reporting (e.g., Charteris-Black and Ennis, 2001), political discourse (e.g., De Landtsheer, 2009), and science discourse (e.g., Semino, Hardie, Koller, and Rayson, 2009).

As a consequence of the strong focus in CMT on the conceptual functions of metaphor, its use as a tool to accomplish specific communicative goals was long sidelined (e.g., Charteris-Black, 2004; Semino, 2008; and Steen, 2008). However, recent

¹ Following conventions in cognitive linguistics (see, e.g., Lakoff, 1993), we use small capitals to indicate conceptual domains.

developments in metaphor studies have sparked renewed interest in the role of metaphor used *as* metaphor in communication (e.g., Cameron, 1999, 2003; Charteris-Black and Musolff, 2003; Gola and Ervas, 2016; Semino, 2008; and Wee, 2005). This has led to an increase in the number of rhetorically-oriented approaches to metaphor which approach metaphor more from its discourse functions (such as to explain, elucidate, exemplify, clarify, persuade) than from its cognitive functions (e.g., Charteris-Black, 2005; Eubanks, 2000; Goatly, 1997; Müller, 2008; and Musolff, 2004).

Based on the analysis of metaphor in natural language use, researchers have noticed that metaphors can fulfil different functions in different contexts, and that some metaphors seem more creative, more striking, or more explicitly metaphorical than others (e.g., Cameron, 2003; Cameron and Low, 1999; Musolff and Zinken, 2009; and Semino, 2008). Consider, for instance, the following two examples, the first of which comes from a novel, the second from a scientific journal:

(1) Life is like *a box of chocolates*

(Murakami, 1989²; emphasis added)

(2) Insights *into* [human] evolution *from* the gorilla genome sequence

(Scally *et al.*, 2012; emphasis added)

Both (1) and (2) contain metaphor in that one thing (the target domain) is described in terms of something else (the source domain; Lakoff and Johnson, 1980). In (1), life is

² To many, this example may be particularly familiar because it also featured in the 1994 film *Forrest Gump*.

described in terms of a box of chocolates. In (2), gaining insights about evolution is described in terms of movement ('into', 'from').

Although these examples are thus similar in that they contain metaphor, they are also different from each other. Example (1) contains an explicit metaphorical comparison, signalled by the preposition 'like'. By comparing life to something very concrete that is clearly different from it – a box of chocolates – the metaphor stands out in the discourse. In this case, the metaphor is potentially used *as* a metaphor at the level of communication between language users (Steen, 2008, 2011, 2015). By contrast, the metaphorical prepositions 'into' and 'from' in (2) both have a more concrete basic meaning (related to movement) that contrasts with, but can be compared to, a more abstract contextual meaning (related to scientific insights), which allows their identification as metaphors at the level of linguistic analysis (see Pragglejaz Group, 2007). There is, however, no indication that these prepositions are used *as* metaphors at the level of communication between language users. That is, the metaphorical use of these prepositions constitutes the language means that we typically use to talk about gaining insights (see Cameron, 2003; and Semino, 2008). These prepositions thus do not function *as* metaphors in communication.

The fact that the role of metaphor in communication has been put back on the agenda for metaphor research (e.g., Cameron, 2003; Charteris-Black and Musolff, 2003; Goatly, 1997; and Semino, 2008) yields new questions about the pervasiveness of metaphor. That is, although it is clear that metaphor is a frequently occurring phenomenon in natural language use, exhibiting a range of linguistic as well as conceptual properties, our analysis of the examples in (1) and (2) above shows that not all metaphors are used *as* metaphors in communication between language users. It remains as yet unclear how

these two types of metaphor use are distributed in discourse, and more specifically across register and word class.

The difference between the metaphors in (1) versus (2) above may be related to the fact that these examples come from different registers. Literature (Example 1) is typically associated with creative, striking figurative language use (e.g., Dorst, 2015; and Semino and Steen, 2008), while academic discourse (Example 2), is associated with reporting scientific findings in a clear, objective way (e.g., Herrmann, 2013). The difference between (1) and (2) may also be related to the fact that the metaphors in these examples belong to different word classes. Content words (including ‘N-of-N’ constructions such as ‘box of chocolates’ in the first example) rather than function words (such as the prepositions in the second example) are associated with the type of metaphor that is used *as* metaphor in communication (e.g., Cameron, 2003; and Goatly, 1997). All of this is further complicated by the fact that registers also differ in their distribution of word classes (e.g., Biber, 1989; and Biber and Conrad, 2009). For example, nouns tend to occur more frequently in academic texts and news texts, and less frequently in face-to-face conversations. Verbs, on the other hand, tend to occur more frequently in face-to-face conversations and fiction, and less frequently in academic texts and news texts (e.g., Biber, 1988). This aspect should therefore also to be taken into account when investigating the occurrence of metaphor in communication in relation to the association with register and word class.

The aim of this paper is to investigate the occurrence of words that count as metaphors at the dimensions of language, thought, and communication, in comparison with words that count as metaphors at the dimensions of language and thought, but not at the dimension of communication. Specifically, we examine the distribution of these two

types of metaphor use across different written and spoken registers, as well as across different word classes.

2. Metaphor in communication

The CMT claim about the pervasiveness of metaphor has been investigated in numerous studies (see, e.g., Gibbs, 2008, for an overview). The first linguistic studies applying CMT were typically based on introspection and intuition, in line with the analyses presented by Lakoff and Johnson (1980; e.g., Grady, 1997; Kövecses, 2002; and Ritchie, 2003). More recent studies analyse the occurrence of metaphor in natural language use (e.g., Deignan, Littlemore, and Semino, 2013; Low, Todd, Deignan, and Cameron, 2010; MacArthur, Oncins-Martínez, Sánchez-García, and Piquer-Píriz, 2012; and see Cameron and Low, 1999). Results of a recent large-scale corpus analysis conducted with the Metaphor Identification Procedure Vrije Universiteit (MIPVU; Steen *et al.*, 2010a) showed that, on average, one in every seven and a half words (i.e., 13.3% of all words) across four different registers (academic texts, fiction, news, and face-to-face conversations) can be identified as a metaphor-related word. Much attention thus has been paid to the linguistic and conceptual analysis of metaphor.

The detailed analysis of the linguistic and conceptual nature of metaphor has led to renewed attention for the special role that metaphor can have in its communicative status *as* metaphor between language users (e.g., Cameron, 2003; Charteris-Black and Musolff, 2003; Goatly, 1997; Müller, 2008; Semino, 2008; and Steen, 2008, 2011). In particular, researchers have suggested distinguishing between the types of metaphor use

illustrated in (1) versus (2) above in a number of slightly different, yet comparable, ways. Some concentrate on the different functions these two types of metaphors may fulfil in communication (e.g., Charteris-Black and Musolff, 2003; and Semino, 2008). Others suggest that the metaphoric meaning of some, but not other, metaphors may be foregrounded by language users in interaction (e.g., Cameron, 2003; and Müller, 2008). In this paper, we adopt Deliberate Metaphor Theory (henceforth: DMT), the framework developed by Steen (2008, 2011, 2015) to account for the communicative dimension of metaphor. In DMT, the cognitive-linguistic model of metaphor in language and thought is extended with a third dimension – that of communication. At the dimension of communication, the resulting three-dimensional model makes a distinction between deliberate and non-deliberate metaphor (Steen, 2008, 2011; and see also Cameron, 1999, 2003). Deliberate metaphors work as ‘perspective changers’ (Steen, 2016: 116); they provide an external perspective onto the target domain of an utterance or text by drawing attention to the source domain referent of the metaphor. DMT predicts that this explicit change of perspective may, in turn, result in the experience of metaphor *as* metaphor in communication between language users (Steen, 2017). By contrast, when a metaphor is non-deliberate, it does not draw attention to the source domain of the metaphorical expression. Consequently, DMT predicts that non-deliberate metaphors may not be experienced *as* metaphors in communication between language users (Steen, 2017). These are predictions about processing that are best addressed in experimental psycholinguistic research, although natural observations about metaphor in talk and text may clearly support the tenability of this proposal.

In this paper, we therefore use DMT as a theoretical framework and take a semiotic approach to the identification and analysis of deliberate metaphor in language use on the basis of texts and transcripts of talk. How (potentially) deliberate metaphors can be observed in the data is not always easy: some metaphors signal their deliberate nature, others depend on co-text and context. This methodological issue has been addressed in our development of a reliable deliberate metaphor identification procedure (Reijnierse, Burgers, Krennmayr, and Steen, 2018). Taking a semiotic perspective at deliberate metaphor implies that we do not analyse language use from the perspective of actual language users and the psychological processes that play a role in their production and reception of (non-)deliberate metaphor. To make explicit that we are exclusively concerned with the analysis of text and transcripts of talk as products, not processes, we use the term ‘potentially deliberate metaphor’ in the remainder of this paper (see Krennmayr, 2011; and Nacey, 2013).

Since its introduction, several studies have used DMT to investigate the presence of deliberate versus non-deliberate metaphor in discourse (e.g., Beger, 2011, 2016; Nacey, 2013; Ng and Koller, 2013; Pasma, 2011; Perrez and Reuchamps, 2014; and Tay, 2013). The results of these studies, as well as the results of studies based on some of the related proposals on the role of metaphor in communication (Cameron, 2003, and Charteris-Black and Musolff, 2003), provide some first suggestions as to the manifestation of deliberate versus non-deliberate metaphors in discourse.

Firstly, the frequency of deliberate metaphor ranges between 0.3% in news articles about the introduction of the euro in financial newspapers (Charteris-Black and Musolff,

2003), and 10% in primary school discourse (Cameron, 2003)³, and even up to 27.9% in citizens discourse about Belgian federalism (Perrez and Reuchamps, 2014). Secondly, Cameron (2003) suggests that deliberate metaphors are typically nouns, and that non-deliberate metaphors are typically verbs. Goatly (1997) already pointed in the same direction when claiming that the more ‘active’ a metaphor is (on his scale from ‘dead’ to ‘active’), the more likely it is to be a noun. And thirdly, results of a corpus-analytical study reported in Steen *et al.* (2010b)⁴ demonstrate that direct metaphors display a distributional pattern in discourse that is different from the overall distribution of metaphor as reported in Steen *et al.* (2010a).⁵ Direct metaphors are often part of a simile, in which the metaphorical comparison is signalled by the preposition ‘like’ or ‘as’. Direct metaphors thus ‘explicitly [instruct] addressees to set up a cross-domain comparison between the referents designated by the words in the discourse’ (Steen *et al.*, 2010b: 786). Because of the explicit comparison between source and target domain referents, direct metaphors can be seen as a typical manifestation of deliberate metaphor in language use. The results of Steen *et al.*’s (2010b) study consequently suggest that deliberate metaphor may be relatively frequent in fiction and news texts, and relatively infrequent in academic texts and face-to-face conversations (see also Dorst, 2015).

³ Please note that Charteris-Black and Musolff (2003) distinguish between a semantic and a pragmatic definition of metaphor, and that Cameron (2003) distinguishes between deliberate and conventional metaphors. Despite these terminological differences, the distinctions made by both Charteris-Black and Musolff (2003), and Cameron (2003) point at a similar distinction as the distinction between deliberate and non-deliberate made in DMT.

⁴ For reasons of readability, we refer to this publication as Steen *et al.* (2010b), even though one of the co-authors in Steen *et al.* (2010a), Pasma, is not a co-author in Steen *et al.* (2010b).

⁵ Steen *et al.* (2010a, 2010b) distinguish between three types of metaphor in discourse: 1) indirect metaphors, when a lexical unit itself is used metaphorically (e.g., the prepositions in example (2) in this paper); 2) direct metaphors, when a lexical unit is not used metaphorically itself, but expresses a cross-domain mapping in the form of a comparison (see example (1) in this paper); 3) implicit metaphors, when a lexical unit refers back to an antecedent that is used metaphorically (e.g., ‘allow a minority to capture power, and then use *it*’).

Yet, the analysis of the role that metaphor plays in communication often has been carried out in a somewhat impressionistic fashion. That is, the distinction between deliberate and non-deliberate metaphor is typically not worked out in detail in the form of operational definitions or identification criteria (see Beger, 2011; Nacey, 2013; Ng and Koller, 2013; and Steen, 2011). As a consequence, it is difficult to compare the outcomes of the different studies to each other, and, as such, to draw conclusions about the frequency and distribution of deliberate metaphor in language use.

In this paper, we aim to systematically investigate the frequency and distribution of deliberate versus non-deliberate metaphor across register and word class. To this end, we start from an operational definition of potentially deliberate metaphor in which its core characteristic, attention to the source domain, is operationalised in such a way that it can be identified in the structures of language. Consequently, our operational definition of potentially deliberate metaphor is as follows: ‘A metaphor is potentially deliberate when the source domain of the metaphor is part of the referential meaning of the utterance in which it is used’ (Reijnierse *et al.*, 2018: 136).⁶ This operational definition is subsequently related to an identification criterion that is part of a step-by-step method to identify all potentially deliberate versus non-deliberate metaphors in natural language use. Our research question in this paper is as follows:

⁶ In DMIP, the three dimensions of metaphor in DMT – language, thought, and communication – are linked to the distinction between symbols, concepts and referents. This implies that: “For a metaphor to count as potentially deliberate, it must not only be identified as a source-domain *word* at the linguistic level of utterance meaning and consequently as a source-domain *concept* at the conceptual level, but it also has to set up a source-domain *referent* in the state of affairs designated by the utterance” (Reijnierse *et al.*, 2018: 134)

Research Question: To what extent does the distribution of potentially deliberate metaphor differ from the distribution of non-deliberate metaphor across register and word class?

3. Method

In Section 3.1, we first introduce the materials used for the analyses presented in this paper. Then, we present the procedure that was used to identify potentially deliberate metaphors in natural language (Section 3.2). Finally, we report on inter-rater reliability testing in Section 3.3.

3.1 Materials

The analyses in this paper are based on the VU Amsterdam Metaphor Corpus (hereafter: VUAMC). This corpus contains almost 190,000 lexical units⁷ from four different registers (academic texts, news texts, fiction, and face-to-face conversations), selected from the British National Corpus Baby edition. All lexical units in the VUAMC are annotated for linguistic metaphor by means of the Metaphor Identification Procedure Vrije Universiteit (MIPVU), an explicit, reliable, step-by-step procedure for the identification of metaphor in discourse (Steen *et al.*, 2010a; and see also Pragglejaz

⁷ The term ‘lexical unit’ is used instead of ‘word’ because sometimes a unit of analysis consists of more than one word. This is the case, for instance, for phrasal verbs and multiword expressions (see Steen *et al.*, 2010a: 26–32, for details).

Group, 2007). Table 1 displays the distribution of all metaphors (MRWs, for ‘metaphor-related words’; see Steen *et al.*, 2010a) versus non-metaphors (non-MRWs) in the VUAMC.

To investigate the distribution of potentially deliberate versus non-deliberate metaphor in this paper, only the lexical units that were identified as related to metaphor on the basis of MIPVU were selected from the corpus, yielding a total of 24,762 metaphor-related lexical units for analysis. These are distributed across the four registers as follows: 8,803 MRWs (35.55% of all analysed MRWs) come from academic texts, 3,515 MRWs (14.19%) come from face-to-face conversations, 5,127 MRWs (20.71%) come from fiction, and 7,317 MRWs (29.55%) come from news texts.

[Table 1 about here]

3.2 Procedure

Potentially deliberate metaphors were identified by means of the Deliberate Metaphor Identification Procedure (henceforth: DMIP), a method for the systematic and reliable identification of potentially deliberate metaphor in language use from a semiotic perspective (see Reijniere *et al.*, 2018, for a detailed explanation). DMIP consists of a series of steps that analysts have to go through to determine whether a lexical unit can be identified as a potentially deliberate metaphor. These steps are presented below.

1. Read the entire text to get a general idea of what the text is about.
2. Apply the Metaphor Identification Procedure Vrije Universiteit (MIPVU) to find all metaphorical lexical units (metaphor-related words, or MRWs; see Steen *et al.*, 2010a for detailed instructions).
3. Look at the first MRW.
4. Determine whether the source domain of the MRW is part of the referential meaning of the utterance in which the MRW is used.
 - a. If ‘yes’, mark the MRW as potentially deliberate and proceed to step 5.
 - b. If ‘no’, mark the MRW as non-deliberate and proceed to step 6.
 - c. In case of doubt, mark the MRW as potentially deliberate, and add the code WIDLII (When In Doubt Leave It In; see Steen *et al.*, 2010a). Then, proceed to step 5.
5. If the MRW is coded as potentially deliberate in step 4, describe *how* the source domain of the MRW is part of the referential meaning of the utterance.
6. Look at the next MRW.

First, analysts have to read the complete text to establish a general understanding of its content (step 1). Then, they have to determine whether a lexical unit counts as a metaphor by applying MIPVU (step 2; Steen *et al.*, 2010a). In the study reported in this paper, this step is redundant because the corpus on which our analyses are based was already coded for all metaphor-related words by means of MIPVU. Yet, most researchers wanting to apply DMIP may not have such a pre-coded corpus at their disposal, which is why MIPVU is part of the identification procedure for potentially deliberate metaphor.

Once all lexical units in a text are annotated for metaphor by means of MIPVU, the identification of potentially deliberate metaphor can take place. To this end, analysts look at the first metaphor-related lexical unit in the text (step 3). In step 4, the analyst must determine whether the source domain of the MRW is part of the referential meaning

of the utterance in which the MRW is used. To ensure reproducibility and to prevent the intuitions of the analyst to interfere in this analysis, corpus-based dictionaries are used to establish the various contemporary word meanings of lexical units. In line with Steen *et al.* (2010a), we recommend using the *Macmillan English Dictionary* and the *Longman Dictionary of Contemporary English* when applying DMIP. Finally, if an MRW is identified as potentially deliberate, the analyst is asked to describe how the source domain of the metaphor plays a role in the referential meaning of the utterance in which the MRW is used (step 5).

How DMIP works in practice is illustrated by means of an example analysis from the VUAMC. This example, (3), contains one metaphor-related word as identified by MIPVU, which is indicated below by a superscript ‘MRW’ tag. The example comes from a newspaper article in which a journalist describes a visit to the Anglo-Scottish border area called ‘Cheviot Hills’. The headline of the article is as follows:

(3) Christopher Somerville sees how woodland has usurped^{MRW} the ancient cattle thieves of the Cheviot Hills.

(VUAMC-AHC-60)

In (3), the verb ‘usurped’ is identified as a metaphor-related word by means of MIPVU. This verb comes from the domain of people, which is different than the target domain of this utterance, which is concerned with the description of a natural environment. Consequently ‘usurped’ is also related to metaphor at the dimension of thought: the concept USURP comes from a different domain than the target domain of the utterance.

To determine whether the MRW ‘usurped’ counts as a case of potentially deliberate metaphor, we examine whether there are cues that suggest that the source domain of people plays a role in the referential meaning of the utterance. For the verb ‘usurp’ only one sense description is available in the dictionary: ‘to take a job or position that belongs to someone else without having the right to do this’ (*Macmillan*). This meaning of the verb does not match the target domain of the utterance. No conventionalised target domain meaning is thus available, indicating that a new perspective on the target domain is introduced. Consequently, for a coherent representation of the referential meaning of the utterance, the source domain is present as a distinct referent in the state of affairs designated by the utterance. In this way, DMIP identifies ‘usurp’ as a case of potentially deliberate metaphor. The referential meaning of (3) can be spelled out as: ‘... how woodland has taken the place of the ancient cattle thieves in a way that is similar to a person taking the job or position of someone else...’

3.3 Reliability

To examine the reliability of DMIP, an inter-rater reliability test was performed. In this test, two coders (the first author of this paper and a research assistant who had been involved in testing and improving the method) independently applied DMIP to 900 randomly selected metaphor-related words from the VUAMC. Results show an inter-rater agreement of 97.33% in the classification of these 900 MRWs as potentially deliberate or non-deliberate. The associated Cohen’s kappa ($\kappa = .69$) indicates ‘substantial agreement’ (Landis and Koch, 1977: 165) between the two coders. This indicates that DMIP is a

reliable method for the identification of potentially deliberate metaphor. Based on this result, the first author of this paper applied DMIP to the remaining 23,862 MRWs in the corpus.

4. Results

Descriptive statistics are presented in Section 4.1. Section 4.2 contains the results of the main analysis in which we investigated the extent to which the distribution of potentially deliberate metaphor versus non-deliberate metaphor differs across different registers and word classes.

4.1 Descriptive statistics

The application of DMIP to all metaphor-related words in the VUAMC yielded 1,079 potentially deliberate metaphors out of a total of 24,762 metaphor-related words, which corresponds to 4.36% of the data (See Table 2).⁸ A number of metaphorical lexical units were difficult to classify, and were therefore coded as WIDLII (When In Doubt Leave It In). This concerns a total of 142 cases (13.16% of the total number of potentially deliberate metaphors in the VUAMC). To be as inclusive as possible, all WIDLIIs were

⁸ The data and data-analytical procedures of the corpus analysis and the reliability test reported in this paper are publicly accessible on the Open Science Framework (OSF) at: <https://osf.io/fvzch>.

counted as potentially deliberate metaphors in the quantitative analysis (see Steen *et al.*, 2010a, for a similar approach for all metaphor-related words coded as WIDLII). Excluding WIDLII from the analysis did not affect the results. However, for the sake of transparency, a complete overview of this alternative analysis is available on the Open Science Framework (OSF) at <https://osf.io/fvzch>.

The majority of metaphor-related words in the VUAMC are thus used non-deliberately. In relation to the complete VUAMC, containing a total of 186,673 lexical units, potentially deliberate metaphors account for 0.58% of the data. Steen *et al.* (2010a) found that one in every seven and a half lexical units was related to metaphor (regardless of deliberateness). Our results further specify this picture by revealing that around one in every 172 lexical units in the VUAMC counts as metaphor at the dimension of communication because it is potentially used deliberately as a metaphor in communication between language users.

Prior to the analysis of the distribution of potentially deliberate metaphor in the VUAMC across different registers and word classes, a three-way contingency table was created to check for compatibility with assumptions about statistical testing. This table contained the same eight word classes as Steen *et al.* (2010a) used in their study (i.e., adjectives, adverbs, conjunctions, determiners, nouns, prepositions, verbs, and a remainder category containing pronouns, numbers, etc.), as well as the variables ‘register’ (academic, conversations, fiction, and news), and ‘potentially deliberate metaphor’ (potentially deliberate, non-deliberate).

The contingency table showed low expected counts in some cells, which implied that the assumption regarding expected frequencies for carrying out a chi-square analysis was violated. Specifically, four cells in the contingency table contained expected counts

of less than five (but more than one) potentially deliberate metaphors: potentially deliberate determiners in fiction and news, and potentially deliberate lexical units in the remainder category in academic and news. Another two cells contained expected counts of less than one potentially deliberate metaphor: potentially deliberate lexical units in the remainder category in conversation and fiction. Moreover, conjunctions were never used as potentially deliberate metaphors in any of the four registers, so these cells were completely empty.

We consequently decided to reduce the number of word classes to six: adjectives, adverbs, nouns, verbs, prepositions, and a remainder category with all other word classes (including determiners and conjunctions). Two cells in the resulting contingency table had an expected frequency of less than five (but more than one) potentially deliberate lexical units: the remainder category in fiction and in news. We accepted the potential loss of test power that resulted from this decision, and performed Fischer's exact test (which is accurate for expected frequencies of less than five; Field, 2013) for the remainder category in the relevant chi-square analysis.

4.2 Main analysis

The goal of this paper was to investigate to which extent the distribution of potentially deliberate metaphor differs from the distribution of non-deliberate metaphor across different registers and word classes. To answer this research question, a hierarchical log-linear analysis was conducted with 'potentially deliberate metaphor' (potentially deliberate, non-deliberate), 'register' (academic, conversations, fiction, news), and 'word

class' (adjectives, adverbs, nouns, verbs, prepositions, remainder) as predictors. This three-way analysis produced a final model that included all effects. The likelihood ratio of the model was $\chi^2(0) = 0, p = 1$. This indicated that the highest-order effect of potentially deliberate metaphor * register * word class was significant ($\chi^2(15) = 41.86, p < .001$). Table 2 displays the distribution of the non-deliberate and potentially deliberate metaphors per register for each of the six word classes. These results thus indicated that the interaction between potentially deliberate metaphor and register varied across word class.

Before we examine the significant three-way interaction, we first discuss the three significant two-way interactions (register * word class, potentially deliberate metaphor * word class, and potentially deliberate metaphor * register). The first of these, between register and word class, is linked to the results of previous research, showing that registers in general differ in their distribution of word classes (see Biber, 1989; and Biber and Conrad, 2009, for similar observations). The second and third two-way interactions yield new findings that provide insight into the distribution of potentially deliberate metaphor across word class and register, respectively. These results are also compared to the distribution of all MRWs across register and word classes, as reported in Steen *et al.* (2010a, 2010b).

The first separate chi-square test investigated the interaction between register and word class. Please note that this first two-way interaction is based on all 24,762 metaphorical lexical units in our data set, not on the entire VUAMC. The results of this test showed that the six word classes were not distributed equally across the four registers ($\chi^2(15) = 1,084.85, p < .001, \text{Cramer's } V = .12$), although the association was 'weak'

(Rea and Parker, 2014: 219).⁹ These findings match our expectations because we know from previous research that word classes are not distributed evenly across registers (e.g., Biber, 1989).

Inspection of the adjusted standardised residuals showed that metaphor-related adjectives were used less frequently in academic texts and face-to-face conversations, and more frequently in fiction and news than might be expected by chance. Metaphor-related adverbs were used less frequently than expected in academic texts and news, and more frequently in face-to-face conversations and fiction. Metaphor-related nouns were used less frequently than expected in face-to-face conversations and fiction, and more frequently than expected in academic texts and news. Metaphor-related verbs were used less often than might be expected in academic texts. They were used more often than expected in the three other registers. Metaphor-related prepositions were used less frequently than expected in face-to-face conversations and fiction, and more frequently than expected in academic texts. In news, metaphor-related prepositions did not differ from the overall distribution. Finally, metaphor-related lexical units from the remainder category were used less frequently than expected in academic texts and news, and more frequently in face-to-face conversations. The distribution of this word class in fiction did not differ from the general distribution of remainder items in the data set. An overview of these findings is displayed in Table 2.

[Table 2 about here]

⁹ In the remainder of this paper, all further interpretations of the strength of the effect size, as measured by Cramer's *V*, are also based on terminology suggested by Rea and Parker (2014).

These patterns can be linked to Biber's (e.g., 1989), and Biber and Conrad's (2009) multidimensional analysis of register variation. For instance, the more informational registers, such as academic texts, make use of nouns and prepositions to provide information. Because this information is often about abstract entities, the nouns and prepositions are more frequently used in their metaphorical sense than in their non-metaphorical sense (see, e.g., Steen *et al.*, 2010a; and see also Herrmann, 2013). This is reflected in our analysis in which we exclusively focused on metaphor-related lexical units. We connect these (and further) observations to the distribution of potentially deliberate versus non-deliberate metaphor across the four registers and the six word classes under investigation upon examination of the three-way interaction below.

The second two-way interaction investigated the association between potentially deliberate metaphor and word class. This association was also statistically significant, yet 'weak' ($\chi^2(5) = 925.45, p < .001$, Cramer's $V = .19$). Potentially deliberate metaphor was thus not distributed equally across the six word classes. Inspection of the adjusted standardised residuals showed that metaphor-related adjectives and nouns were more frequently potentially deliberate than expected. Conversely, adverbs, verbs, prepositions, and the remainder category were less frequently used as potentially deliberate metaphors (versus non-deliberate metaphors) than expected. An overview of these findings is displayed in Table 2.

These are new findings that cannot be compared to earlier systematic findings about the relation between potentially deliberate metaphor and word class. They can be compared, though, to findings by Cameron (2003) as well as by Goatly (1997), who both argued that deliberate metaphors are typically nouns. The current results can also be

compared to Cameron's (2003) finding that non-deliberate (or, in Cameron's terms 'conventionalized') metaphors are typically verbs. Our results confirm these findings, but they also further specify them. Not only nouns, but also adjectives are more frequently used as potentially deliberate metaphors. And not only verbs, but also adverbs, prepositions, and items in the remainder category are more frequently used as non-deliberate metaphors than expected. These findings are further interpreted within the framework of the three-way interaction between potentially deliberate metaphor, register, and word class below.

The third two-way interaction that we investigated was that between potentially deliberate metaphor and register. The chi-square test investigating this relation also showed a significant yet 'weak' association between the two variables ($\chi^2(3) = 336.96, p < .001$, Cramer's $V = .12$). This finding can be compared to the interaction between register and metaphor as found by Steen *et al.* (2010a, 2010b). Specifically, our results further specify the pattern found for the interaction between direct (versus indirect and implicit) metaphor across registers reported in Steen *et al.* (2010b). When taking into account the distribution of all potentially deliberate metaphors across the four registers (rather than looking at direct metaphors alone), we find the same pattern as Steen *et al.* (2010b) found for direct metaphor.

That is, inspection of the adjusted standardised residuals shows that in both news texts and fiction, potentially deliberate metaphor (versus non-deliberate metaphor) was used more frequently than expected. Conversely, in academic texts and face-to-face conversations, potentially deliberate metaphor (versus non-deliberate metaphor) was used less frequently than expected. An overview of these findings is displayed in Table 2, and

these results are interpreted within the framework of the three-way interaction which is discussed next.

As was pointed out at the beginning of this section, the log-linear analysis containing all three variables showed that the highest-order three-way interaction between potentially deliberate metaphor, register, and word class was statistically significant. Given our main interest in the relation between potentially deliberate metaphor and register, this effect was broken down to specifically investigate the interaction between potentially deliberate metaphor and register for each of the six word classes. Separate chi-square tests were therefore performed that investigated the interaction between potentially deliberate metaphor and register for each of the six word classes.

The analyses for nouns ($\chi^2(3) = 170.39, p < .001$, Cramer's $V = .18$), verbs ($\chi^2(3) = 61.85, p < .001$, Cramer's $V = .10$) and prepositions ($\chi^2(3) = 39.85, p < .001$, Cramer's $V = .08$) showed a statistically significant, yet 'weak', association between register and (non-)deliberate metaphor. In these word classes, metaphorically used words were more frequently potentially deliberate as compared to non-deliberate in news texts and fiction, and less frequently potentially deliberate in academic texts and face-to-face conversations than might be expected by chance. As such, these word classes thus displayed the same pattern as the overall interaction between potentially deliberate metaphor and register discussed earlier.

For adjectives, adverbs, and metaphorically used words in the remainder category, however, this pattern was different. For adjectives, the distribution of potentially deliberate metaphors differed significantly between the registers ($\chi^2(3) = 38.42, p < .001$, Cramer's $V = .13$), yet the association was 'weak'. Inspection of the adjusted standardised

residuals showed that academic texts contained fewer potentially deliberate (versus non-deliberate) metaphorical adjectives than expected. Fiction, on the other hand, contained more potentially deliberate (versus non-deliberate) metaphorical adjectives. This pattern is the same as in the overall interaction between register and potentially deliberate metaphor. Face-to-face conversations and news texts, however, did not show that same pattern for metaphorical adjectives. In these registers, the distribution of potentially deliberate (versus non-deliberate) metaphorical adjectives was not significantly different from the overall distribution of metaphorical adjectives in the corpus.

We also found a statistically significant, yet 'weak', association between potentially deliberate metaphorically used adverbs and register ($\chi^2(3) = 13.33, p = .004$, Cramer's $V = .11$). Inspection of the adjusted standardised residuals showed that only news texts displayed the same pattern as the overall interaction between potentially deliberate metaphor and register. That is, news texts contained more potentially deliberate metaphorical adverbs (compared to non-deliberate metaphorical adverbs) than might be expected by chance. In the three other registers (academic texts, face-to-face conversations, and fiction), the distribution of potentially deliberate versus non-deliberate metaphorical adverbs did not differ significantly from the overall distribution.

Finally, for lexical units in the remainder category, Fisher's exact test was used to compute the association between potentially deliberate metaphor and register, because two out of the eight cells for metaphorical remainder items had expected counts of less than five (potentially deliberate MRWs in academic texts and news). Results showed that the distribution of potentially deliberate metaphorical lexical units in the remainder category differed significantly between the registers ($p < .001$). Inspection of the adjusted standardised residuals showed that potentially deliberate metaphorically used words in

the remainder category occurred more frequently than expected in news, compared to non-deliberate metaphors. Moreover, potentially deliberate remainder items occurred less frequently than expected in face-to-face conversations and academic texts. This was similar to the general pattern found for the distribution of potentially deliberate metaphor across register. By contrast, the distribution of potentially deliberate metaphorical remainder items in fiction was not significantly different from the overall distribution of metaphorical remainder items in the corpus. An overview of these findings is displayed in Table 2. The results of our analysis can now be interpreted in more detail.

5. Discussion and Conclusion

In this paper, we investigated the occurrence of potentially deliberate (versus non-deliberate) metaphor across four different registers and six different word classes. To this end, we analysed all 24,762 metaphor-related words in the VUAMC with DMIP, a method for the reliable and systematic identification of potentially deliberate metaphor in language use. The results of this analysis showed that 4.36% of all metaphor-related words in the VUAMC were potentially deliberate. That is, one in every 23 MRWs in our corpus displayed one or more cues indicating that the source domain of the MRW is part of the referential meaning of the utterance in which that MRW is used. This means that the bulk of what counts as metaphorical at the dimensions of language and thought does not count as metaphorical at the third dimension of metaphor in DMT (Steen, 2008, 2011, 2015), namely that of communication.

When further specifying our results, a pattern emerged according to which the four registers under investigation (academic texts, face-to-face conversations, fiction, and news texts) can be split into two groups. News texts and fiction, on the one hand, contained significantly more potentially deliberate metaphors than expected. By contrast, academic texts and face-to-face conversations contained significantly fewer potentially deliberate metaphors than expected.

These results differ from the results of previous research investigating the distribution of all metaphor-related words across the same four registers (Steen *et al.*, 2010a). Steen *et al.* (2010a) demonstrated that academic texts and news texts contained significantly more metaphorically-used (versus non-metaphorically-used) words than expected. By contrast, fiction and face-to-face conversations contained significantly fewer metaphor-related words than expected. At the same time, our results confirm and further specify the results of previous research investigating the distribution of direct versus indirect metaphor across register as reported by Steen *et al.* (2010b). Our results, like the results for direct metaphor obtained by Steen *et al.* (2010b), showed that fiction rather than academic texts is the most ‘metaphorical’ of the four registers when it comes to metaphor in communication, because fiction contains the highest percentage of MRWs that are used *as* metaphors between language users of all four registers under investigation.

Table 3 displays a systematic comparison between the overall distribution of all metaphor-related words (based on the results of Steen *et al.*, 2010a; indicated, in Table 3, by ‘GM’, for ‘general distribution of metaphor-related words’) and the distribution of potentially deliberate metaphors (based on the results presented in the current paper; indicated, in Table 3, by ‘DM’, for ‘distribution of potentially deliberate metaphors’),

across registers per word class. The overview in Table 3 roughly displays two different patterns. The first pattern shows for academic texts and fiction, while the second pattern shows for face-to-face conversations and news texts.

In academic texts, all word classes that contained significantly more metaphor-related words than expected in the analyses of Steen *et al.* (2010a) contained significantly fewer potentially deliberate metaphors than expected in the analyses carried out in the current paper. Exceptions in academic texts are adjectives (significantly fewer cases than expected in both analyses) and adverbs (more cases in Steen *et al.*, 2010a, no deviation from the general distribution in the analysis reported in this paper). For fiction, this pattern is reversed: all word classes that contained significantly fewer metaphor-related words than expected in the analyses of Steen *et al.* (2010a), contained significantly more potentially deliberate metaphors than expected in the analyses carried out in the current paper. Exceptions in fiction are adjectives (no deviation from the general distribution in Steen *et al.*, 2010a, significantly more cases than expected in the current analysis), adverbs (no deviation from the general distribution in both analyses), and lexical units in the remainder category (significantly fewer cases than expected in Steen *et al.*, 2010a, no deviation from the general distribution in the current analysis).

[Table 3 about here]

The second pattern shows for face-to-face conversations and news, where such contrast between the two analyses does not occur. That is, all word classes in face-to-face

conversations contained significantly fewer cases of both all metaphor-related (versus non-metaphor-related) words and of potentially deliberate (versus non-deliberate) metaphors than expected. The only difference between the two analyses can be found in adjectives and adverbs, for which the distribution of potentially deliberate metaphors does not differ from the general distribution. In news, all word classes contained significantly more metaphor-related words than expected in the analysis of all metaphor-related words, except nouns and lexical items in the remainder category. In the analysis reported in the current paper, all word classes contained significantly more potentially deliberate metaphors than expected, except for adjectives, which did not differ from the general distribution.

By adding the distinction between potentially deliberate and non-deliberate metaphor to the picture, our analysis provides further support for the general, intuitive idea that some registers are ‘more metaphorical’ than others (e.g., Dorst, 2015). That is, the reason why some registers, including fiction (Dorst, 2015; Lodge, 1977; and Semino and Steen, 2008) and (in part) news texts (e.g., Semino, 2008) ‘feel’ more metaphorical than others may be because they contain more potentially deliberate metaphors. Because potentially deliberate metaphors are those metaphors that are used as metaphors in communication between language users, they may be more noticeable than non-deliberate metaphors, which do not have such a function (see, e.g., Steen, 2013, 2017). Whether this is indeed the case when actual language users process (either in production or reception) potentially deliberate versus non-deliberate metaphor is a question that subsequent psycholinguistic and psychological research should test. On the basis of the semiotic analyses that we carried out in this paper, however, we can explain the observed differences between the occurrence of potentially deliberate metaphor across the four

registers and the six word classes. In this way, our findings can also be seen as an addition to the extensive literature on register analysis (Biber, 1989; Biber and Conrad, 2009; and Biber *et al.*, 1999).

Our analysis showed that fiction and news contain significantly more potentially deliberate (versus non-deliberate) metaphors compared to the overall distribution of (non)deliberate metaphor in the corpus. In both registers, this pattern was found in nouns, verbs, and prepositions. For fiction, moreover, adjectives also displayed this pattern. The frequent use of potentially deliberate adjectives, nouns, and verbs can be linked to the overall communicative goal of fiction, which Biber *et al.* (1999: 16) call ‘pleasure reading’. Fiction is generally known to contain colourful, creative language. Previous studies have already pointed out that metaphors in fiction may be ‘different’ than metaphors in other registers (e.g., Dorst, 2011, 2015; Semino, 2008, and Semino and Steen, 2008). The use of metaphor *as* metaphor, to present a different or new perspective on the topic of a text, can be seen as one of the key manifestations of this ‘differentness’ of metaphor use in fiction. This particularly applies to content words (nouns, verbs, and adjectives). The frequent use of potentially deliberate metaphorical prepositions in fiction is different, since prepositions are function words. A look at the prepositions in the corpus that were coded as potentially deliberate in fiction, showed that these were often either part of wordplay or of a direct metaphor, for instance in ‘... moving soundlessly from cover to cover like a tiger *in* a steel jungle’ (VUAMC-BPA-14; emphasis added).

A similar interpretation can be given for news, where the frequent potentially deliberate metaphorical use of nouns and verbs might be related to journalists’ wish to ‘pimp up their texts’ (Steen *et al.*, 2010a: 216), and to the idea that news texts often have to grab the reader’s attention (e.g., Brône and Coulson, 2010; Semino, 2008; and White,

2011). In contrast to fiction, the distribution of (non-)deliberate adjectives did not differ from the overall distribution in news texts. However, both adverbs and lexical items in the remainder category were more frequently used potentially deliberate (versus non-deliberate) in news texts. Given that only thirteen adverbs and only fourteen remainder items in news were identified as potentially deliberate, it is difficult to interpret these findings. A look at the adverbs showed, again, that they were either part of a direct metaphor, or of wordplay, for instance ‘the western has galloped *back* to centre screen’ (VUAMC-A2D-05; emphasis added). Inspection of the remainder category showed that the majority of the potentially deliberate lexical units in this category in news texts were either part of a direct metaphor, or a case of implicit metaphor, for instance ‘the only adjustments you need to make are mental *ones*’ (VUAMC-A38-01; emphasis added).

In contrast to fiction and news, academic texts and face-to-face conversations contained significantly fewer potentially deliberate (versus non-deliberate) metaphors than expected. This pattern was also found in nouns, verbs, and prepositions, as well as in the remainder category. In academic texts, moreover, adjectives were also less frequently potentially deliberate. This observation can be linked to the technical, informational nature of the register (Biber, 1988; and Herrmann, 2013). The academic texts in the VUAMC treat fairly abstract subjects such as electromagnetics and law. Moreover, the texts mostly come from scientific publications in which researchers report their findings to their peers (i.e., other researchers), rather than to a general audience or to, for instance, schoolchildren. In this type of academic texts, there is often simply no other way to talk about the abstract scientific topics and processes at hand than by means of metaphor, making non-deliberate metaphor a frequent phenomenon.

For face-to-face conversations, our findings can also be linked to the overall communicative purpose of the register: personal communication (Biber *et al.*, 1999). The conversations in the corpus were generally so basic – going shopping, making homework, having breakfast – that there were hardly any metaphors used, let alone metaphors that introduced new or different perspectives onto the topic of the conversation. This may also be connected to the overall unplanned nature of casual, face-to-face conversations (e.g., Kaal, 2012). That is not to say, though, that similar patterns will be found in other spoken registers. In fact, metaphor has been shown to be frequently used in, for instance, parliamentary debates (e.g., Charteris-Black, 2006), primary school classroom discourse (Cameron, 2003), and psychotherapeutic talk (e.g., Tay, 2013).

In all, the differing distribution of potentially deliberate metaphor across registers and word class can be explained by referring to the overall communicative goals of the type of registers concerned (see Biber *et al.*, 1999), as well as to the role of the different word classes in those registers. This is not to say, however, that the same story will (necessarily) hold for different sub-registers of academic discourse (e.g., popular science versus scholarly journals), conversations (e.g., private versus public conversations), news texts (e.g., reportage versus editorial), and fiction (e.g., mystery fiction versus romance). In fact, potentially deliberate metaphor is regularly used in college lectures (Beger, 2011, 2016), for example, which are a combination of spoken interaction and academic discourse. And in certain forms of spoken discourse that are more planned than casual conversations, such as political speeches, potentially deliberate metaphors likely also play a bigger role (e.g., Goatly, 1997).

Furthermore, subsequent analyses will have to show whether the nature of the potentially deliberate metaphors used in news versus fiction differs, and if so, how.

Fiction may, for instance, contain more explicit metaphorical comparisons (such as similes with ‘like’ and ‘as’; see, e.g., Dorst, 2011). By contrast, news may contain more instances of wordplay (see, e.g., Semino, 2008). Such further analyses can also investigate the reasons for the infrequent use of potentially deliberate metaphors in academic texts and face-to-face conversations. All of this will, in turn, yield a more encompassing understanding of the use and distribution of potentially deliberate as well as non-deliberate metaphor in language use.

The analyses in this paper can be seen as a first systematic, semiotic, corpus-analytical application of DMT (Steen 2008, 2011, 2015). By operationalising deliberate metaphor for semiotic analysis, and subsequently analysing almost 25,000 metaphor-related words, this study provides new insights into the special use of metaphor across register (see Steen *et al.*, 2010a). That is, some registers are generally considered ‘more metaphorical’ than others, and our analyses suggest that this is not caused by the overall number of metaphors that are present in these registers, but instead by the fact that they contain relatively more *potentially deliberate* metaphors (see also Dorst, 2015). One possible explanation for the (relatively) frequent use of potentially deliberate metaphors in some registers is that such metaphors contribute to the overall communicative goals of a register. For instance, potentially deliberate metaphors in fiction may be used to increase readers’ reading experience and enjoyment, and potentially deliberate metaphors in news texts may be used to attract readers’ attention. Based on these results, precise hypotheses can be formulated to test the psychological reality of potentially deliberate metaphors for the average language user (see Gibbs, 2015; and Steen, 2015). In this way, our results can be used to further develop DMT, and to further investigate how DMT relates to similar, related models of metaphor, most notably those developed by Cameron (2003), Charteris-

Black and Musolff (2003), Müller (2008; and see Müller, 2016), and Goatly (1997; and see also Deignan, 2005).

References

- Beger, A. 2011. 'Deliberate metaphors? An exploration of the choice and functions of metaphors in US-American College lectures', *Metaphorik.de* 20, pp 39–60.
- Beger, A. 2016. 'Different functions of (deliberate) metaphor in teaching scientific concepts.', *Metaphorik.de* 26, pp 57–84.
- Biber, D. 1988. *Variation across speech and writing*. Cambridge: Cambridge University Press.
- Biber, D. 1989. 'A typology of English texts', *Linguistics* 27, pp 3–43.
- Biber, D., and Conrad, S. 2009. *Register, genre, and style*. Cambridge: Cambridge University Press.
- Biber, D., Johansson, S., Leech, G, Conrad, S., and Finegan, E. 1999. *The Longman grammar of spoken and written English*. London: Longman.
- Brône, G., and Coulson, S. 2010. 'Processing deliberate ambiguity in newspaper headlines: Double grounding', *Discourse Processes* 47 (3), pp 212–236. doi:10.1080/01638530902959919
- Cameron, L. 1999. 'Operationalising 'metaphor' for applied linguistic research' in L. Cameron and G. Low (eds.) *Researching and applying metaphor*, pp 3–28. Cambridge: Cambridge University Press.
- Cameron, L. 2003. *Metaphor in educational discourse*. London: Continuum.
- Cameron, L., and Low, G. (eds.). 1999. *Researching and applying metaphor*. Cambridge: Cambridge University Press.
- Charteris-Black, J. 2004. *Corpus approaches to critical metaphor analysis*. Basingstoke: Palgrave-Macmillan.
- Charteris-Black, J. 2005. *Politicians & rhetoric*. Basingstoke: Palgrave-Macmillan.

- Charteris-Black, J. 2006. 'Britain as a container: Immigration metaphors in the 2005 election campaign', *Discourse and Society* 17 (5), pp 563–581. doi:10.1177/0957926506066345
- Charteris-Black, J., and Ennis, T. 2001. 'A comparative study of metaphor in Spanish and English financial reporting', *English for Specific Purposes* 20, pp 249–266. doi:10.1016/S0889-4906(00)00009-0
- Charteris-Black, J., and Musolff, A. 2003. "'Battered hero" or "innocent victim"? A comparative study of metaphors for euro trading in British and German financial reporting', *English for Specific Purposes* 22, pp 153–176. doi:10.1016/S0889-4906(02)00012-1
- Deignan, A. 2005. *Metaphor and corpus linguistics*. Amsterdam: John Benjamins.
- Deignan, A., Littlemore, J., and Semino, E. 2013. *Figurative language, genre, and register*. Cambridge: Cambridge University Press.
- De Landtsheer, C. 2009. 'Collecting political meaning from the count of metaphor' in A. Musolff and J. Zinken (eds.) *Metaphor and discourse*, pp 59–78. Houndmills: Palgrave-Macmillan.
- Dorst, A. G. 2011. *Metaphor in fiction: Language, thought and communication*. Oisterwijk: Box Press.
- Dorst, A. G. 2015. 'More or different metaphors in fiction? A quantitative cross-register comparison', *Language and Literature* 24 (1), pp 3–22. doi:10.1177/0963947014560486
- Dorst, A. G., Reijnierse, W. G., and Venhuizen, G. 2013. 'One small step for MIP towards automated metaphor identification? Formulating general rules to determine basic

- meanings in large-scale approaches to metaphor', *Metaphor and the Social World* 3 (1), pp 77–99. doi:10.1075/msw.3.1.04dor
- Eubanks, P. 2000. *A war of words in the discourse of trade. The rhetorical constitution of metaphor*. Carbondale, IL: Southern Illinois University Press.
- Field, A. 2013. *Discovering statistics using SPSS* (4th ed.). London: SAGE.
- Gibbs, R. W. (ed.). 2008. *The Cambridge handbook of metaphor and thought*. Cambridge: Cambridge University Press.
- Gibbs, R. W. 2011. 'Evaluating conceptual metaphor theory', *Discourse Processes* 48 (8), pp 529–562. doi:10.1080/0163853X.2011.606103
- Gibbs, R. W. 2015. 'Does deliberate metaphor theory have a future?', *Journal of Pragmatics* 90, pp 73–76. doi:10.1016/j.pragma.2015.03.016
- Goatly, A. 1997. *The language of metaphors*. London: Routledge.
- Gola, E., and Ervas, F. (eds.). 2016. *Metaphor and communication*. Amsterdam: John Benjamins.
- Grady, J. E. 1997. 'THEORIES ARE BUILDINGS revisited', *Cognitive Linguistics* 8 (4), pp 267–290. doi:10.1515/cogl.1997.8.4.267
- Herrmann, J. B. 2013. *Metaphor in academic discourse. Linguistic forms, conceptual structures, communicative functions and cognitive representations*. LOT Dissertation Series, vol. 333, Utrecht.
- Kaal, A. A. 2012. *Metaphor in conversation*. Oisterwijk: Box Press.
- Kövecses, Z. 2002. *Metaphor: A practical introduction*. Oxford: Oxford University Press.
- Krennmayr, T. 2011. *Metaphor in newspapers*. LOT Dissertation Series, vol. 276, Utrecht.

- Lakoff, G. 1993. 'The contemporary theory of metaphor', in A. Ortony (ed.) *Metaphor and thought* (2nd ed.), pp 202–251. Cambridge: Cambridge University Press.
- Lakoff, G., and Johnson, M. 1980. *Metaphors we live by*. Chicago, IL: University of Chicago Press.
- Lakoff, G., and Johnson, M. 1999. *Philosophy in the flesh: The embodied mind and its challenge to western thought*. New York, NY: Basic Books.
- Landis, J. R., and Koch, G. G. 1977. 'The measurement of observer agreement for categorical data', *Biometrics* 33 (1), pp 159–174. doi:10.2307/2529310
- Lodge, D. J. 1977. *The modes of modern writing*. London: Arnold.
- Longman Dictionary of Contemporary English Online*. July, 2016. <http://www.ldoceonline.com/>
- Low, G., Todd, Z., Deignan, A., and Cameron, L. (eds.). 2010. *Researching and applying metaphor in the real world*. Amsterdam: John Benjamins.
- MacArthur, F., Oncins-Martínez, J. L., Sánchez-García, M., and Piquer-Píriz, A. M. (eds.). 2012. *Metaphor in use. Context, culture, and communication*. Amsterdam: John Benjamins.
- Macmillan English Dictionary Online*. July, 2016. <http://www.macmillandictionary.com/>
- Müller, C. 2008. *Metaphors dead and alive, sleeping and waking*. Chicago, IL: University of Chicago Press.
- Müller, C. 2016. 'Why mixed metaphors make sense' in R. W. Gibbs (ed.) *Mixing metaphor*, pp 31–56. Amsterdam: John Benjamins.
- Murakami, H. 1989. *Norwegian wood*. Tokyo: Kodansha.
- Musolff, A. 2004. *Metaphor and political discourse: Analogical reasoning in debates about Europe*. Houndmills: Palgrave-Macmillan.

- Musolff, A., and Zinken, J. (eds.). 2009. *Metaphor and discourse*. Houndmills: Palgrave-Macmillan.
- Nacey, S. 2013. *Metaphors in learner English*. Amsterdam: John Benjamins.
- Ng, C. J. W., and Koller, V. 2013. 'Deliberate conventional metaphor in images: The case of corporate branding discourse', *Metaphor and Symbol* 28 (3), pp 131–147. doi:10.1080/10926488.2013.797807
- Pasma, T. 2011. *Metaphor and register variation. The personalisation of Dutch news discourse*. Oisterwijk: Box Press.
- Perrez, J., and Reuchamps, M. 2014. 'Deliberate metaphors in political discourse: The case of citizen discourse', *Metaphorik.de* 25, pp 7–41.
- Pragglejaz Group 2007. 'MIP: A method for identifying metaphorically used words in discourse', *Metaphor and Symbol* 22 (1), pp 1–39. doi:10.1080/10926480709336752
- Rea, L. M., and Parker, R. A. 2014. *Designing and conducting survey research: A comprehensive guide* (4th ed.). San Francisco, CA: Jossey-Bass.
- Reijnierse, W. G., Burgers, C., Krennmayr, T., and Steen, G. J. (2018). DMIP: A method for identifying potentially deliberate metaphor in language use. *Corpus Pragmatics* 2 (2), pp 129–147. doi:10.1007/s41701-017-0026-7
- Ritchie, D. 2003. "“ARGUMENT IS WAR” – Or is it a game of chess? Multiple meanings in the analysis of implicit metaphors', *Metaphor and Symbol* 18 (2), pp 125–146. doi:10.1207/S15327868MS1802_4
- Scally, A., *et al.* 2012. 'Insights into hominid evolution from the gorilla genome sequence', *Nature* 483, pp 169–175. doi:10.1038/nature10842
- Semino, E. 2008. *Metaphor in discourse*. Cambridge: Cambridge University Press.

- Semino, E., Hardie, A., Koller, V., and Rayson, P. 2009. 'A computer-assisted approach to the analysis of metaphor variation across genres', *Paper presented at the Corpus-Based Approaches to Figurative Language: A Corpus Linguistics 2009 Colloquium*.
- Semino, E., and Steen, G. J. 2008. 'Metaphor in literature' in R. W. Gibbs (ed.) *The Cambridge handbook of metaphor and thought*, pp 232–246. Cambridge: Cambridge University Press.
- Steen, G. J. 2008. 'The paradox of metaphor: Why we need a three-dimensional model of metaphor', *Metaphor and Symbol* 23 (4), pp 213–241. doi:10.1080/10926480802426753
- Steen, G. J. 2011. 'The contemporary theory of metaphor – now new and improved!', *Review of Cognitive Linguistics* 9 (1), pp 26–64. doi:10.1075/rcl.9.1.03ste
- Steen, G. J. 2013. 'Deliberate metaphor affords conscious metaphorical cognition', *Cognitive Semiotics* 5 (1–2), pp 179–197. doi:10.1515/cogsem.2013.5.12.179
- Steen, G. J. 2015. 'Developing, testing and interpreting deliberate metaphor theory', *Journal of Pragmatics* 90, pp 67–72. doi:10.1016/j.pragma.2015.03.013
- Steen, G. J. 2016. 'Mixed metaphor is a question of deliberateness' in R. W. Gibbs (ed.) *Mixing metaphor*, pp 113–132. Amsterdam: John Benjamins.
- Steen, G. J. 2017. 'Attention to metaphor: Where embodied cognition and social interaction can meet, but may not often do so' in B. Hampe (ed.) *Metaphor. Embodied cognition and discourse*, pp 279–296. Cambridge: Cambridge University Press.
- Steen, G. J., Dorst, A. G., Herrmann, J. B., Kaal, A. A., Krennmayr, T., and Pasma, T. 2010a. *A method for linguistic metaphor identification: From MIP to MIPVU*. Amsterdam: John Benjamins.

- Steen, G. J., Dorst, A. G., Herrmann, J. B., Kaal, A. A., and Krennmayr, T. 2010b. 'Metaphor in usage', *Cognitive Linguistics* 21 (4), pp 765–796. doi:10.1515/cogl.2010.024
- Tay, D. 2013. *Metaphor in psychotherapy. A descriptive and prescriptive analysis*. Amsterdam: John Benjamins.
- Wee, L. 2005. 'Constructing the source: Metaphor as a discourse strategy', *Discourse Studies* 7 (3), pp 63–384. doi:10.1177/1461445605052191
- White, M. 2011. 'Cracking the code of press headlines: From difficulty to opportunity for the foreign language learner', *International Journal of English Studies* 11 (1), pp 95–116.

Table 1. Distribution of metaphor-related (MRW) versus non-metaphor-related (non-MRW) words per register in the VU Amsterdam Metaphor Corpus

Register	Relation to metaphor		Total <i>N</i>
	Non-MRW <i>n</i>	MRW <i>n</i>	
Academic	40,510 ^x	8,803 ^y	49,313
Conversation	44,421 ^y	3,515 ^x	47,936
Fiction	39,510 ^y	5,127 ^x	44,637
News	37,470 ^x	7,317 ^y	44,787
Total	161,911	24,762	186,673

Note. ^x, ^y = the frequency of non-metaphor-related or metaphor-related words was ^x lower, or ^y higher than might be expected on the basis of chance, with alpha set at .001 (adjusted standardised residuals at least < -3.29 or > 3.29). Please note that the numbers reported in Table 1 differ slightly from those reported in Steen *et al.* (2010a). These small differences are the result of a corpus clean-up project that was carried out in 2011 to increase the consistency of the corpus annotations (see Dorst, Reijnerse, and Venhuizen, 2013). The association between register and relation to metaphor based on these ‘cleaned-up’ results remained significant: $\chi^2(3) = 2,858.02, p < .001$, Cramer’s $V = .12$.

Table 2. Distribution of the non-deliberate and potentially deliberate metaphors across register by word class

Word class	Type of metaphor	Register				
		Academic <i>n</i>	Conversation <i>n</i>	Fiction <i>n</i>	News <i>n</i>	Total <i>N</i>
Adjective	Non-deliberate	739 ^y	213	479 ^x	702	2,133 ^c
	Potentially deliberate	26 ^x	10	64 ^y	67	167 ^d
	Total	765 ^a	223 ^a	543 ^b	769 ^b	2,300
Adverb	Non-deliberate	247	276	265	223 ^x	1,011 ^d
	Potentially deliberate	3	3	6	13 ^y	25 ^c
	Total	250 ^a	279 ^b	271 ^b	236 ^a	1,036
Noun	Non-deliberate	2,087 ^y	382 ^y	807 ^x	1,382 ^x	4,658 ^c
	Potentially deliberate	118 ^x	28 ^x	185 ^y	254 ^y	585 ^d
	Total	2,205 ^b	410 ^a	992 ^a	1,636 ^b	5,243
Verb	Non-deliberate	2,073 ^y	1,049 ^y	1,420 ^x	2,017 ^x	6,559 ^d
	Potentially deliberate	41 ^x	5 ^x	67 ^y	101 ^y	214 ^c
	Total	2,114 ^a	1,054 ^b	1,487 ^b	2,118 ^b	6,773
Preposition	Non-deliberate	2,728 ^y	840 ^y	1,356 ^x	2,060 ^x	6,984 ^d
	Potentially deliberate	6 ^x	2 ^x	22 ^y	36 ^y	66 ^c
	Total	2,734 ^b	842 ^a	1,378 ^a	2,096	7,050
Remainder	Non-deliberate	733 ^y	707 ^y	450	448 ^x	2,338 ^d
	Potentially deliberate	2 ^x	0 ^x	6	14 ^y	22 ^c
	Total	735 ^a	707 ^b	456	462 ^a	2,360
Total	Non-deliberate	8,607 ^f	3,467 ^f	4,777 ^e	6,832 ^e	23,683
	Potentially deliberate	196 ^e	48 ^e	350 ^f	485 ^f	1,079
	Total	8,803	3,515	5,127	7,317	24,762

Note. ^a, ^b = analysis of register * word class; the frequency was ^a lower, or ^b higher than might be expected on the basis of chance, with alpha set at .05 (adjusted standardised residuals at least < -1.96 or > 1.96). ^c, ^d = analysis of metaphor * word class; the frequency was ^c lower, or ^d higher than might be expected on the basis of chance, with alpha set at .05 (adjusted standardised residuals at least < -1.96 or > 1.96). ^e, ^f = analysis of metaphor * register; the frequency was ^e lower, or ^f higher than might be expected on the basis of chance, with alpha set at .05 (adjusted standardised residuals at least < -1.96 or > 1.96). ^x, ^y = analysis of metaphor * register per word class; the frequency was ^x lower, or ^y higher than might be expected on the basis of chance, with alpha set at .05 (adjusted standardised residuals at least < -1.96 or > 1.96).

Table 3. Comparison of the general distribution of metaphor-related words ('GM'; based on the results of Steen et al., 2010a) and the distribution of potentially deliberate metaphors ('DM'; based on the analyses in the current paper) across register per word class

Word class	Register							
	Academic		Conversations		Fiction		News	
	GM	DM	GM	DM	GM	DM	GM	DM
Adjective	-	-	-	.	.	+	+	.
Adverb	+	.	-	.	.	.	+	+
Noun	+	-	-	-	-	+	.	+
Verb	+	-	-	-	-	+	+	+
Preposition	+	-	-	-	-	+	+	+
Remainder	+	-	-	-	-	.	.	+
Overall	+	-	-	-	-	+	+	+

Note. GM = 'general distribution of metaphor-related words'; DM = 'distribution of potentially deliberate metaphors'. '+', '-' = the frequency was '+' significantly higher, or '-' significantly lower than might be expected on the basis of chance, with alpha set at .05 (adjusted standardised residuals at least < -1.96 or > 1.96). And '.' = the frequency indicates that the frequency did not differ from the general distribution, with alpha set at .05 (adjusted standardised residuals at least < -1.96 or > 1.96).