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ARTICLE

A frame-semantic approach to conceptual metaphors in the domain of emotion

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Abstract

The article explores the metaphorical conceptualization of emotions. Conceptual metaphors are understood here as frames (i.e., structures of knowledge in long-term memory) in their own right. For modeling both the source and target domains of metaphors, the CoMetNet (*Conceptual Metaphor Network*) project uses frames documented in the German FrameNet-Construction project in spite of ad hoc created domains in previous literature. By doing so, it strives for a more empirically motivated description of conceptual metaphors. Drawing on a specialized corpus, it is shown that (1) our frame-semantic approach permits addressing the status of emotion concepts in the conceptual and linguistic system. More specifically, it shows that (2) frame elements (FEs) reflect adequately which aspects are relevant in the conceptualization of emotions and that (3) the complexity of emotion concepts can be thought of as an interplay between (different types of) frames. However, there are still some challenges for CoMetNet, e.g., the frame-semantic description of emotion metaphors that draw on highly schematic and scalar source domains.

Keywords: conceptual metaphor; constructicography; emotions; frame semantics; German FrameNet-Construction

1. Introduction: emotions, conceptual metaphors and frames

When we talk about emotions, we often draw on conceptual metaphors (Kövecses, 2000): The abstract domain of emotion is understood in terms of another (typically concrete) domain of experience (Lakoff & Johnson, 1980). For instance, in *He's filled with anger*, the emotion is understood as a liquid. Although there has been extensive research with regard to emotion metaphors over the last decades (e.g., Crawford, 2009; Fainsilber & Ortony, 1987; Kövecses, 2000; Mon et al., 2021), as of today, it is not clear how they can be described systematically as part of our linguistic and conceptual knowledge.

Even though in psychology emotions are usually defined as physical and mental states evoked by various stimuli, including thoughts, sensory inputs or other (physical)



experiences (Ekman & Davidson, 1994, p. 291), there is no generally accepted definition that applies across disciplines, such as psychology, neuroscience, anthropology, philosophy and sociology. Although – or precisely because – emotions are highly individual, they can be shared intersubjectively, not least through language. How emotions are conceptualized, linguistically coded and communicated has long been the subject of linguistic research (Lindquist, 2021).

In this paper, we follow up on this tradition by adopting a frame-semantic approach to metaphor. Sullivan (2013) shows that both the source and the target domain of metaphors can be conceived as structured by frames. We extend this approach by combining conceptual metaphor theory, frame semantics and, in methodological terms, ‘constructicography’ (Lyngfelt *et al.*, 2018). Specifically, we are drawing on well-documented frames in the German FrameNet-Constructicon¹ (Ziem *et al.*, 2019), a resource that documents form-meaning structures of contemporary German on the lexicon-grammar continuum. In doing so, our approach differs from classical analyses of conceptual metaphors that are mostly working with domains that have been postulated in an ad hoc fashion (e.g., Gibbs, 2008; Kövecses, 1986, 2005; Musolff, 2021). Thus, on the one hand, the aim of the present paper is to show potential avenues for a more coherent and empirically motivated approach to metaphor analysis. On the other hand, we present a case study to showcase how such an approach can be applied to the specific domain of emotion metaphors.

While the present paper is more ‘corpus-illustrated’ (Stefanowitsch, 2020) or ‘corpus-informed’ rather than corpus-based or corpus-driven, the lexicographic description of conceptual metaphor frames serves as a starting point for linguistic annotations of concrete instances, that is, metaphors-in-use, which in turn often feeds back into lexicographic analyses of conceptual metaphors yielding compilations for conceptual metaphor entries in FrameNet (or similar lexicographic resources).

In frame semantics as established by Fillmore (2014), frames are conceived of as conceptual structures that motivate the understanding and use of language. Each frame is structured by a set of frame-specific semantic ‘slots’, so-called frame elements (FEs). FEs are classified ‘in terms of how central they are to a particular frame, distinguishing three levels: core, peripheral, and extra-thematic’ (Ruppenhofer *et al.*, 2016, p. 23). Core FEs instantiate ‘a conceptually necessary component of a frame, while making the frame unique and different from other frames’ (Ruppenhofer *et al.*, 2016, p. 23).² To capture the meaning of metaphorical expressions, we argue that FEs of the source domain map onto FEs of the target domain and that this process gives rise to a frame in its own right: the conceptual metaphor frame. However, as shown in Figure 1 the conceptual metaphor frame does not only comprise mapped FEs but also FEs that are projected directly from the source domain and the target domain, respectively, onto the metaphor domain. Against the background of the ongoing debate in conceptual metaphor research on the presumable difference between frames and domains (e.g., Kövecses, 2020, pp. 50–92), frames as conceived by Fillmore and in the FrameNet literature do not only include lexical frames, that is, frames that are evoked by lexical units. While FrameNet started out as a lexicographic resource that puts lexical units, and in particular verbs, center stage, the very definition

¹<https://framenet-constructicon.hhu.de/> [retrieved March 25, 2024]; the repository comprises 1285 frames and 125 conceptual metaphor frames (as of March 25, 2024).

²For how the ‘coreness’ of FEs is determined, see Ruppenhofer *et al.*, 2016, pp. 23–25.

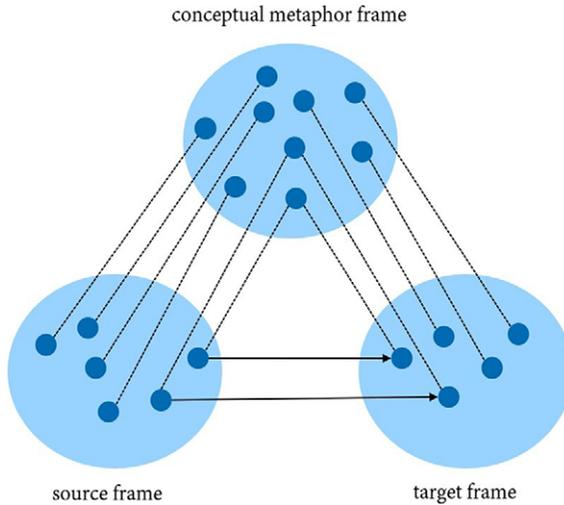


Figure 1. A conceptual metaphor frame and its mapping processes.

of frames entails that they are not necessarily tied to (specific) lexical units, which is why current frame-semantic approaches assume and operationalize more abstract frame types. These include so-called non-lexical frames, e.g., scenario frames, as well as maximally abstract image-schematic frames (for an overview, cf. Ziem, 2014, pp. 5–48). Thus, we use the notion of frame in a broader sense than studies on conceptual metaphors usually do. As for the notion of domain, we follow Langacker's (1987, p. 488) definition of domain as a 'coherent area of conceptualization relative to which semantic units may be characterized' (see Dancygier & Sweetser, 2014, p. 17, for a similar definition; also see Rosca, 2013). We refrain from equating domains with frames, as has sometimes been suggested in the literature (see Sullivan, 2017, p. 402, for an overview), and instead argue that source and target domains are structured, to a large extent but not exclusively, by frames (in line with Sullivan, 2013, p. 36).

In the case of conventional metaphors (i.e., extremely common metaphors in everyday language), which will be the main focus of this paper, the mapping process of FEs is not to be understood as taking place every time metaphorical language is processed. Rather, it is assumed that the conceptual metaphor frame is evoked directly. Following the standard assumptions of conceptual metaphor theory, we conceive of metaphor as a product that is a part of the conceptual system in long-term memory. By contrast, as Kövecses (2020) shows, novel (or ad hoc) metaphors can be analyzed more aptly drawing on mental spaces and blending theory (Fauconnier & Turner, 1998, 2002), which focus on online processes of meaning construction. Conceptual metaphors are not ad hoc mappings from a source to a target domain but are cognitively entrenched. But to understand the metaphorical expression, recipients still need an understanding of source and target frame. As the mapping between source and target is incomplete and selective (cf. Figure 1), they also have to know which FEs are mapped and which are not.

Frames can be particularly useful in accounting for emotion metaphors. From a psychological point of view, emotions are internal states that are (to a certain extent) assumed to be intersubjectively shared and thus similar across instances. As they are

mental states, their linguistic conceptualization strongly depends on metaphors. The metaphors used must in turn be anchored in the shared world of experience in order to make emotions accessible. Thus, for three reasons we assume that frames are particularly useful for capturing the relationship between source and target domains as well as the metaphor meaning itself (resulting from multiple mappings between source and target domain): First, frames provide a structure identified by FEs and relations to other frames, which enables fine-grained descriptions; second, frames reflect the entire context of experience – a system of concepts – to which both the source and target domains relate (frames thus go far beyond word meanings); and third, meanings of conceptual metaphors can be identified as conceptual structures in their own right: as fully-fledged frames that differ from other (especially lexical) frames.

In the present study, we address the following questions: How can emotion metaphors be described in frame-semantic terms to account for both the source and target domain in terms of frames? Which aspects of source domains play a constitutive role in the conceptualization of emotions, and how can they be described using the analytic toolkit of frame semantics? More specifically, which FEs occur in emotion frames, and how do they interact with each other? And finally, to what extent is a frame-semantic approach able to cover the complexity of emotion concepts, as well as of metaphoric concepts in general, e.g., in terms of their potential hierarchically motivated structures? At the same time, our paper aims at providing a first proof-of-concept for developing a frame-based repository of conceptual metaphors (CoMetNet) within the German FrameNet-Constructicon project. This endeavor follows the lead of the MetaNet project (Dodge *et al.*, 2015; Petruck, 2016). But while MetaNet's work was largely independent of the Berkeley FrameNet (Ruppenhofer *et al.*, 2016), and source and target frames were mostly created *ad hoc*, CoMetNet is both conceptually and technically fully integrated into the German FrameNet-Constructicon. We consider this an important advantage and will discuss some challenges that this approach entails in more detail below.

The remainder of this paper is structured as follows: In [Section 2](#), we introduce the small corpus our case study draws on. [Section 3](#) discusses the analytic approach taken to link source and target FEs both on an abstract and conceptual level and with regard to its application to concrete corpus examples. [Section 4](#) zooms in on one particularly salient emotion metaphor, namely, ANGER IS HOT FLUID IN A CONTAINER,³ providing a detailed discussion of how it can be analyzed in frame-semantic terms. [Section 5](#) focuses on a potentially problematic case with (seemingly?) conflicting target domains and looks at ways to resolve this problem. In [Section 6](#), the most important implications of our analysis are summarized.

2. Corpus compilation and method

As our goal is not a large-scale analysis of metaphoric mappings in emotion concepts but rather a proof-of-concept that a frame-based approach to the analysis of emotion metaphors is both feasible and insightful, we draw on a small dataset compiled specifically for this study. More precisely, we compiled a custom corpus (7,147 words) drawing on articles from German popular science magazines (three from

³In the following, conceptual metaphors, domains and FEs are indicated by small caps.

Spektrum, two from *Psychologie Heute* and two from *Emotion*) dealing with emotions. Articles were obtained by searching for keywords that refer to some of the most basic emotions⁴ (e.g., *Hass* ('hate'), *Wut* ('anger'), *Liebe* ('love'), *Stolz* ('pride'), *Angst* ('fear'), and *Freude* ('joy')) on each magazine's website. In fact, the most frequent emotion words that actually occurred denote negative emotion concepts, including *Angst*, *Ärger* ('anger'), *Wut* and *Zorn* ('wrath'). But also generic terms including *Emotionen* ('emotions') and *Gefühle* ('feelings') are used to a considerable extent. Note, however, that these overt expressions constitute only a small part of instances of emotion concepts, namely, these instances in which the target domain of the metaphor is realized linguistically. As a matter of fact, there are many cases of metaphors where only the source domain is expressed, while the target domain has to be inferred from the context.

Using such a small dataset has the advantage that the full texts can be taken into account in the annotation process, which allows for taking the broader context into account in which metaphors occur. The data were coded by two of the authors. First, the articles were checked for instances of conceptual metaphors in general, broadly following the Metaphor Identification Procedure (Pragglejaz Group, 2007). Second, if such instances were detected, they were examined more closely as to whether they refer to emotion concepts, that is, whether their target domain can be regarded as being structured by an emotion frame. Third, metaphors that fulfill these requirements were taken into account for the subsequent analysis. Their source domains were then checked for fitting frames from the German FrameNet-Constructicon, that is, the coders checked if an existing frame plausibly contributes to the meaning of the expression at hand. In the event that none of the existing frames fit, there are (at least) two possibilities: either – on the basis of the frame-semantic tenet that linguistic units of varying degrees of schematicity and abstractness always evoke a frame – the frame is not evoked lexically (but, e.g., grammatically) or a new (fitting) lexical frame has to be compiled. In the latter case, the common procedure in CoMetNet is to draw on additional annotations of authentic data in order to examine carefully if it is useful and necessary to compile a new lexical frame to the German FrameNet-Constructicon repository.

Like other FrameNets that are under active development, the German FrameNet is a continuously evolving repository. As a result, if a frame required for a source or target domain is missing, this does not mean that the metaphor cannot be accounted for in frame-semantic terms. The fourth and final step relates to analyzing conceptual metaphor frames in terms of the mapping processes; in our dataset, more than 50 instances of conceptual metaphors in the domain of emotion were detected, some of which will be discussed in more detail in the following sections.

3. Conceptualizing emotions: mapping of FEs between source and target frame

This section introduces the approach taken here, offering examples of how specific emotion metaphors can be accounted for in frame-semantic terms. In particular, we address two groups of emotion metaphors: the first one comprising emotion

⁴The keywords were selected on the basis of what could be called 'the lowest common denominator' in emotion research with respect to emotion classification (for an overview, see van Berkum, 2023).

metaphors with VISION as source domain and the second one including emotion metaphors with the HUMAN BODY as source domain. We use – as is common in frame-semantic analyses – simple assertive sentences such as *lexical expression X evokes frame Y, which consists of the frame elements Z*. Importantly, these descriptions reflect the lexicographic process of creating and thus modeling frames in CoMetNet and FrameNet on the basis of annotated sample sentences, aiming at a coherent framework for constructicographic purposes. We do not claim that these descriptions necessarily describe cognitively real processes, although we aim for them to be cognitively plausible. Generally, compiling frames can be seen as a way to model linguistic knowledge on the basis of annotated data along the lines of the Berkeley FrameNet annotation policy (Ruppenhofer *et al.*, 2016). Additional data and additional annotations may, at least to some extent, affect the lexicographic process of frame compilation.

3.1. Group 1: Emotions and their visual (im-)perceptibility

Consider the following corpus examples⁵:

- (1) Hierarchie und autoritärer Führungsstil operieren hochgradig mit [verdeckter^{Target}] [Emotion_is_EclipsedAngst^{Target}].
'Hierarchy and authoritative leadership style operate with **covert anxiety** to a high degree'
- (2) Es können interne Konflikte und ganz spezifische Pannen entstehen, die die [verdeckte^{Target}] [Emotion_is_EclipsedAngst^{Target}] offenlegen.
'Internal conflicts and specific glitches can emerge, unveiling **covert anxiety**'

In (1) and (2), the expression *verdeckte Angst* ('covert anxiety') evokes the conceptual metaphor frame EMOTIONS ARE INVISIBLE OBJECTS.⁶ It is constituted by the source frame ECLIPSE,⁷ which in turn is evoked by the adjective *verdeckt* ('covert'), and the target frame FEELING, evoked by the noun *Angst* ('fear/anxiety'). Here we can already see what distinguishes frame-semantic from 'classical' analyses of conceptual metaphors. Usually, the latter consider (1) and (2) (and also the examples discussed in the remainder of this section and in Section 3.2) to be instances of the EMOTIONS ARE OBJECTS metaphor. While we assume that the more specific conceptual metaphor frame EMOTIONS ARE INVISIBLE OBJECTS indeed entails the generic EMOTIONS ARE OBJECTS metaphor (on metaphorical entailment, see

⁵Excerpts are annotated following the conventions of FrameNet. Conceptual metaphor FEs are shown in subscript in front of the lexical or phrasal expression that instantiates the FE, and annotation targets (i.e., frame-evoking elements) are shown in superscript after the linguistic element. Sometimes, expressions can be instantiations of both FEs and targets. It should be noted, however, that *target*, when used in annotation terms, must not be confused with *target* when used in *target frame* or *target domain*.

⁶In the remainder, we use English translations for both conceptual metaphor frames attested for German and their FEs, and we use the English equivalents for German frames and their FEs included in the Berkeley FrameNet. See the appendix for a list containing all English frames and FEs mentioned in the paper and their equivalents in the German FrameNet-Constructicon/CoMetNet.

⁷Note that the frame ECLIPSE goes beyond astronomic contexts (like in *lunar eclipse* or *solar eclipse*) and also captures sentences like *The fence screens the garden from passers-by*, with the verb *screen* evoking ECLIPSE. We like to thank one of the reviewers for their helpful comments on this issue.

Kövecses, 2020, p. 4), the focus in our example seems to be more on the occlusion of the emotion (here: anxiety), which is why the more specific frame *Eclipse* seems to be a better candidate to account for the source domain of this particular metaphor.

The source frame *Eclipse* integrates the core FEs *ECLIPSED* and *OBSTRUCTION*, of which only the first is linguistically salient here: The core of the metaphorical conceptualization is a mapping from the source FE *ECLIPSED* to the target FE *EMOTION*. Note that *ECLIPSED* has to be read as a nominalization here, that is, it refers to the *entity* that is eclipsed from view. Thus, emotions – in our example, specifically anxiety – are understood in terms of eclipsed entities. As a consequence of this metaphorical shift, we could assume that emotions can also be *unveiled*. As (2) shows, this actually seems to be the case (see below for a more exhaustive discussion of this phenomenon).

However, the frame *Eclipse* and its lexical instantiations in (1) and (2) describe a static type of situation and a result of an action or a process, respectively, rather than the action or process itself. Consider the following data:

- (3) Wenn [_{Experiencer_is_Agent}die Kolleginnen und Kollegen] die unerwünschten [_{Emotion_is_Eclipsed}Emotionen^{Target}] alle zu [_{verstecken}^{Target}] beginnen [...]
‘If the colleagues start to **hide** their undesired **emotions**’
- (4) Viele Eltern meinen, [_{Experiencer_is_Agent}ihren] persönlichen [_{Emotion_is_Eclipsed}Frust^{Target}] und Stress vor ihren Kindern [_{verstecken}^{Target}] zu müssen.
‘Many parents think they have to **hide** their personal **frustration** and stress from their children’
- (5) Damit ihre Kinder nicht mitleiden müssen, bemühen sich Eltern zuweilen, [_{Experiencer_is_Agent}ihre] [_{Emotion_is_Eclipsed}Gefühle^{Target}] zu [_{verbergen}^{Target}].
‘In order that their children do not have to co-suffer, some parents attempt to **conceal** their **feelings** at times’

The metaphorical expressions *Emotionen verstecken* (‘hide emotions’), *Frust verstecken* (‘hide frustration’) and *Gefühle verbergen* (‘conceal feelings’) are instantiations of the conceptual metaphor frame *MAKING EMOTIONS IMPERCEPTIBLE IS MAKING PHYSICAL OBJECTS INVISIBLE*. Note that its source frame is not structured by the frame *Eclipse* but by *Hiding_objects*. In this frame, an *AGENT* causes a *HIDDEN_OBJECT* to become perceptually inaccessible to potential perceivers. In contrast to *Eclipse*, there is an *AGENT* involved in *Hiding_objects*. Also, *Hiding_objects* is related to *Eclipse* by a causal relation. We assume the following mapping between FEs from source to target frame: *AGENT* maps onto *EXPERIENCER*, and *HIDDEN_OBJECT* onto *EMOTION*. In this metaphor, not only emotions are understood as physical, hidden objects, but also experiencers of emotions are understood as acting persons who intentionally hide their emotions construed as physical objects.

If emotions can be covert or hidden, an obvious conclusion would be that they can also be made perceptually accessible to potential viewers. Consider the following corpus examples:

- (6) Aber wenn die Persönlichkeit auf der emotionalen Seite gut ausgebildet ist, kann [_{Experiencer_is_Agent}sie] sich mit all ihren Gefühlen hinstellen und sowohl

ihre [_{Emotion_is_Phenomenon}Ängste^{Target}] [zeigen^{Target}] als auch sich behaupten, wo es angebracht ist.

‘But if the personality is well formed on the emotional side, it can position itself with all its feelings and **show** its **anxieties** as well as hold its ground where it’s appropriate’

- (7) Bloß keine negativen [_{Emotion_is_Phenomenon}Gefühle^{Target}] [zeigen^{Target}]?
‘Just do not **show** negative **feelings**?’
- (8) So, dass auch [_{Experiencer_is_Agent}die anderen] etwas von ihren [_{Emotion_is_Phenomenon}Emotionen^{Target}] [zeigen^{Target}] können.
‘So that the others can **show** something from their **emotions**, too’
- (9) Aber wenn [_{Experiencer_is_Agent}sie] Erfahrungen mit der eigenen [_{Angst}^{Target}] gemacht hat und [_{Emotion_is_Phenomenon}diese] dosiert [zeigt^{Target}], dann ist das ein Segen.
‘But if she gained experience with her own **anxiety** and **shows** it dosed, then that’s a blessing’

In these examples, the verb *zeigen* (‘show’) is used to construe emotions like anxiety as physical entities that can be made visually perceivable. The source domain of the conceptual metaphor evoked in these sentences, MAKING EMOTIONS PERCEPTIBLE IS MAKING PHYSICAL OBJECTS VISIBLE, is structured by the frame *Cause_to_perceive*, in which an AGENT, ACTOR,⁸ ENTITY OR MEDIUM causes a PHENOMENON to be perceived by a PERCEIVER. The following mappings between FEs are assumed to be constitutive of the conceptual metaphor frame: AGENT maps onto EXPERIENCER, and PHENOMENON maps onto EMOTION. However, there are many more verbs to construe such an understanding of emotions, like *preisgeben* (‘disclose’) and *offenlegen* (also ‘disclose’; lit. ‘lay open’):

- (10) [_{Experiencer_is_Agent}Ich] muss als Führungskraft etwas von meiner [_{Emotion_is_Phenomenon}Gefühlswelt^{Target}] [preisgeben^{Target}], aber adäquat.
‘As a leader, I have to **disclose** something from my **emotional world**, but in an adequate way’
- (11) [_{Experiencer_is_Agent}Die Vorgesetzte] muss das möglichst reflektiert und verarbeitet tun. Also nicht die nackte [_{Emotion_is_Phenomenon}Angst^{Target}] [preisgeben^{Target}].
‘The superior must do that as reflective and processed as possible. Thus, not **disclosing** the pure **fear**’
- (12) Es können interne Konflikte und ganz spezifische Pannen entstehen, die die verdeckte [_{Emotion_is_Phenomenon}Angst^{Target}] [offenlegen^{Target}].
‘Internal conflicts and specific glitches may emerge, **disclosing** covert **anxiety**’

⁸The difference between ACTOR and AGENT lies in the fact that the ACTOR is a sentient being who is exhibiting some PHENOMENON possibly *unintentionally*, whereas the AGENT *intentionally* creates a situation in which the PERCEIVER observes or experiences the PHENOMENON.

At this point, our data relate to two types of linguistic expressions representing three source frames, that is, three conceptual metaphors. The first type either refers to a static situation (e.g., *verdeckt* ‘cover’) that is captured by the frame *Eclipse* or refers to an intentional act (e.g., *verstecken* ‘hide’ and *verbergen* ‘conceal’) which is captured by the frame *Hiding_objects*. Both subtypes are connected to a setting in which the emotion is construed as a non-visible entity. Corresponding metaphors are *EMOTIONS ARE INVISIBLE OBJECTS* and *MAKING EMOTIONS IMPERCEPTIBLE IS MAKING PHYSICAL OBJECTS INVISIBLE*. The second type refers to the intentional act of making an object visible again (e.g., *zeigen* ‘show’, *offenlegen* ‘disclose’ and *preisgeben* ‘disclose’), which is captured by the frame *Cause_to_perceive*. The corresponding metaphor is *MAKING EMOTIONS PERCEPTIBLE IS MAKING PHYSICAL OBJECTS VISIBLE*. Thus, the metaphoric understanding and conception of emotions as physical entities draws on the cognitive modality of visual perception. However, this modality is not the only one serving as a source domain, as we show in the following section.

3.2. Group 2: Emotions and their physical (un-)controllability

To illustrate group 2, consider the following examples.

- (13) Längst existieren eigene Therapieprogramme, die Menschen helfen sollen, [Experiencer_is_Controlling_entity*ihre*] [Emotion_is_Dependent_Entity*Wut*^{Target}] beim Autofahren besser [in den Griff^{Target}] zu [bekommen^{Target}].
 ‘There are proper therapy programs that have existed for a long time now that ought to help people **get a better grip on their anger** during car driving’
- (14) Patienten, die [Experiencer_is_Controlling_entity*ihre*] aggressive [Emotion_is_Dependent_Entity*Wut*^{Target}] nicht [in Schach halten^{Target}] können.
 ‘Patients who can’t **hold their aggressive anger in check**’

The metaphorical expressions *Wut in den Griff bekommen* ‘get a grip on anger’ and *Wut in Schach halten* ‘hold anger in check’ evoke the conceptual metaphor frame *HANDLING EMOTIONS IS CONTROLLING PHYSICAL OBJECTS*, while the frame *Being_in_control* is used as a source domain: The experiencer of anger is construed as a controlling entity while anger is construed as a somewhat dependent, that is, controlled, entity. Emotions expressed by this conceptual metaphor frame mostly have a negative connotation, like *anger* above. This seems to be characteristic of this source domain: Even when used with positive emotions such as *Freude* ‘joy’, expressions like *in den Griff bekommen* and *in Schach halten* construe the emotion that is to be controlled, or at least its (public) expression, as undesirable.

Another frame serving as a source domain to construe emotions as physical, controllable objects is *Dominate_competitor*. This frame inherits from the frame *Being_in_control*, that is, all of its FEs correspond to equally specific or more specific FEs of the frame *Being_in_control*. (15) shows an instance of a conceptual metaphor that is structured by the source frame *Dominate_competitor* and the target frame *Feeling*:

- (15) Oder auch einfach nur stoisch abzuwarten, bis der [Emotion_is_Patient*Wut*] ausbruch vorübergeht und [Experiencer_is_Agent*der kühle Kopf*^{Target}] wieder [Oberhand gewinnt^{Target}].

‘Or wait stoically until the outburst of anger passes by and **the cool head gains the upper hand again**’

In (15), anger is construed as a physical object (which can be human, of course) that is dominated by the ‘cool head’, which is construed as an agent. In this metaphor, the emotional state relates to the patient, and the entity that experiences the emotion to the agent that exercises control over the patient.⁹ In this sentence, however, in contrast to the examples discussed so far, the realization of the FE EXPERIENCER_IS_AGENT (i.e., the idiomatic expression *kühler Kopf* ‘cool head’) is itself metaphorical, unlike, e.g., *people* and *patients* in (13) and (14), respectively. Its meaning is motivated by the conceptual metaphor REASON IS COOL HEAD, whose source domain exploits the *Body_parts* frame and whose target domain exploits the *Mental_property* frame. The construal of the relation between emotion and reason in (15) lies in treating them as two separable and competing entities. Moreover, the well-attested conceptual metaphor EMOTION IS HEAT suggests to understand reason and emotion as a binary opposition. Corpus examples evoking the EMOTION IS HEAT metaphor are *Hitzkopf* (‘hothead’) and *hitzköpfig* (‘hot-headed’), both relating conceptually to the exact opposite of *der kühle Kopf*: If you are emotional, you are hot; if you are emotionless, you are cool. Being or acting emotionless is equivalent to being reasonable (or acting reasonably).

(16) shows that the type of the entity that is controlled by the agent can be further specified:

- (16) In einem zivilisierten Umfeld gilt [ungebremster^{Target}
 [_{Emotion_is_Vehicle}Zorn^{Target}]_{Target}] als unschicklich.
 ‘In a civilized environment **unbraked wrath** is classified as indecent’

The metaphorical expression *ungebremster Zorn* (‘unbraked wrath’) draws on the frame *Operate_vehicle* as its source domain, evoking the conceptual metaphor frame HANDLING EMOTIONS IS CONTROLLING A VEHICLE: Wrath is understood as a vehicle. An important feature of this conceptual metaphor is that the experiencer of an emotion is construed as the driver of a vehicle. This core FE of the conceptual metaphor frame is not realized in (16), but likely to be conceptually salient.¹⁰ Arguably, driving a vehicle is a form of exercising control. Hence, in this context, the frames *Operate_vehicle* and *Being_in_control* probably interact with each other (although there is no semantic relation between the two frames on the lexical level).

Another way of controlling an entity is affecting its movement abilities up to preventing it from moving in the way it would move if the controlling entity was not there. For illustration, consider (17) and (18).

- (17) Hier triumphiert eher, wer Contenance bewahrt und es versteht,
 [_{Experiencer_is_Agent}sein] [_{Emotion_is_Patient}Ärger^{Target}] zu [zügeln^{Target}].

⁹Note that *Oberhand gewinnen* (‘gain the upper hand’) itself is an instantiation of the conceptual metaphor CONTROL IS UP.

¹⁰FEs that are conceptually salient but not realized linguistically are treated by FrameNet as ‘null instantiations’ (see Ruppenhofer *et al.*, 2016, pp. 28–30).

‘Here more likely someone triumphs who keeps countenance and understands how to **rein in their anger**’

- (18) Bestimmte psychische Störungen machen [unbändige^{Target}]
 [Emotion_is_Patient Wut^{Target}]ausbrüche jedoch wahrscheinlicher.
 ‘Certain mental disorders, however, make **unbridled** outbursts of **anger** more likely’

The conceptual metaphor frames evoked by the expressions *Ärger zügeln* (‘rein in anger’) and *unbändige Wutausbrüche* (‘unbridled outbursts’) are – besides the target frame *Feeling* – structured by the source frame *Immobilization*. In this frame, an agent immobilizes a patient. This means that the emotion (anger) is construed as a patient while the emotional experiencer is construed as an agent. Thus, the conceptual metaphor frame is *HANDLING EMOTIONS IS IMMOBILIZING PHYSICAL OBJECTS*. If we look more closely at the lexical units related to the source domain, however, another source frame comes into play, that is, *Animals*: In its literal sense, *zügeln* relates to the act of tightening the reins of a riding or draught animal in order to hold it back or halt it; *bändigen*, in contrast, relates to the act of fitting an animal with a lead or a bridle. Hence, the FE *PATIENT* of the frame *Immobilization* maps to the frame *Animals* by means of the conceptual metaphor frame *EMOTIONS ARE ANIMALS*, because only if emotions are construed as animals, they can be conceived of as animals that can (or ought to) be immobilized. As a result, the FE *ANIMALS* maps to the FE *PATIENT* and, more importantly, the conceptual metaphor frame *HANDLING EMOTIONS IS IMMOBILIZING PHYSICAL OBJECTS* is specified to *HANDLING EMOTIONS IS IMMOBILIZING ANIMALS*. Figure 2 illustrates the mapping processes in this metaphor:

Overall, the analyses presented in this section suggest the following two conclusions. (1) At least four source frames may be used to conceptualize emotions in terms of their physical (un-)controllability: *Being_in_control* (*in den Griff bekommen, in Schach halten*), *Dominate_competitor* (*die Oberhand gewinnen*), *Operate_vehicle* (*ungebremst*) and *Immobilization* (*zügeln, unbändig*).

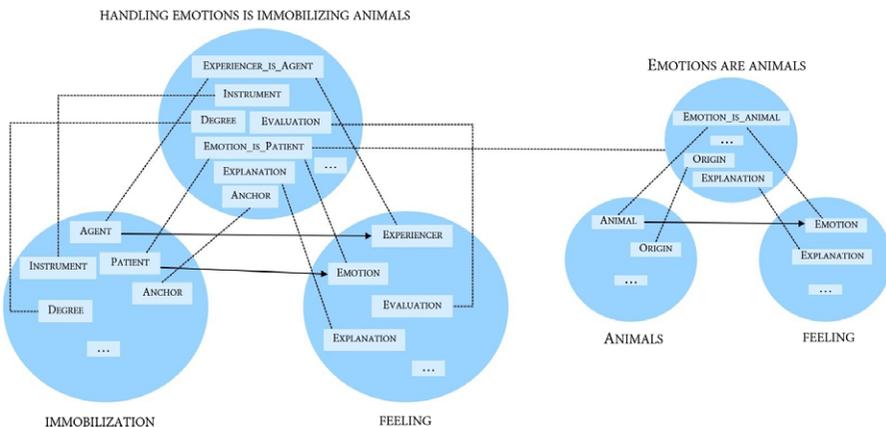


Figure 2. The structure of the conceptual metaphor frame *HANDLING EMOTIONS IS IMMOBILIZING ANIMALS*.

Thus, conceptualizing emotions does not only draw on visual perception as its source domain (cf. Section 3.1) but also on motor control in the sense of directed movement: Most of the activities related to the source frames mentioned above are embodied in that they include the use of one's hands and fingers. Thus, conceptualizing emotions as physical objects has broader implications: Before being able to control an entity, we have to (be able to) see it first. Hence, metaphors of group 2 (Emotions and their physical (un-)controllability) conceptually imply metaphors of group 1 (Emotions and their visual (im-)perceptibility). (2) Certain aspects (FEs) of some metaphors are themselves structured by metaphors (cf. REASON IS COOL HEAD and EMOTIONS ARE ANIMALS). To investigate such hierarchies of metaphors (or metaphor networks) in detail, the following section looks more closely at the conceptual metaphor ANGER IS A HOT FLUID IN A CONTAINER and its underlying metaphor network.

4. The complexity of emotion metaphors: ANGER IS A HOT LIQUID and its network of metaphors

In the previous sections, we have already hinted at some challenges arising from modeling conceptual metaphors with frames. In this section, we provide a detailed discussion of some major issues of analyzing (families of) metaphors as frames, drawing on the example of the conceptual metaphor ANGER IS A HOT LIQUID (see, e.g., Sullivan, 2017, p. 388). The first challenge relates to varying degrees of schematicity specific to the conceptual structures involved in a given metaphoric mapping. Metaphors may relate to both barely schematic and highly schematic structures, such as those provided by image-schematic frames. Consider (19).

- (19) Nichts lässt so zuverlässig die Gemüter hochkochen wie »der Idiot, der hier mit 30 Sachen durch die Gegend schleicht« und einem damit wertvolle Sekunden der eigenen Lebenszeit stiehlt.
(‘Nothing lets **boil up tempers** as reliably as “the idiot who drives through the area here very slowly at 30 kilometres per hour” and steals precious seconds of one’s lifetime’)

In (19), *Gemüter hochkochen* (‘boil up moods/tempers’) instantiates the very productive conceptual metaphor ANGER IS HOT FLUID IN A CONTAINER (Kövecses, 2000). Now, what is the structure of this metaphor? In terms of the hierarchical dimension, the highest (and therefore most abstract) metaphor is EMOTIONS ARE OBJECTS, structured by the source frame *Physical Entity* and the target frame *Feeling* (see Section 3). Moreover, in (19), the verb *hochkochen* relates to a specific kind of physical entities, namely, to liquids. In this example, it is thus the more specific conceptual metaphor EMOTIONS ARE LIQUIDS – a daughter of EMOTIONS ARE OBJECTS – which features a conceptually adequate level of schematicity.

Note that an important attribute of liquids relates to temperature. For example, boiling liquids yields a *gradual* rise in their temperature. This is why the metaphor EMOTION IS HEAT is not only structured by the frames *Temperature* and *Feeling* but also by the image-schematic frame *Scale*. As has been pointed out elsewhere (e.g., Stefanowitsch, 2006, p. 75), both metaphors EMOTIONS ARE LIQUIDS (or, more specifically, ANGER IS A LIQUID) and ANGER IS HEAT combined give rise to the conceptual metaphor ANGER IS A HOT LIQUID. To account for such

Table 1. The complex frame-semantic architecture of ANGER is a hot fluid in a container

Conceptual metaphor	Involved frames
EMOTIONS ARE OBJECTS	A. Physical_entity, B. Feeling
EMOTIONS ARE LIQUIDS	C. Substance, A, B
EMOTION IS HEAT	D. Temperature, E. Scale, B
ANGER IS A HOT LIQUID	F. Anger, C, D, E
BODY IS A CONTAINER FOR EMOTIONS	G. Wholes_and_parts, H. Containing, B, C
ANGER IS A HOT FLUID IN A CONTAINER	A, B, C, D, E, F, G, H

relations between conceptual metaphor frames, we use hierarchical relationships, first and foremost inheritance, just like in Berkeley FrameNet.

In the CMT literature, we often find more specific descriptions of this metaphor, and the metaphor is usually called ANGER IS A HOT LIQUID IN A CONTAINER. It is said to interact with another fundamental (e.g., Kövecses, 2000, 2020) and well-attested¹¹ metaphor, namely, BODY IS A CONTAINER FOR EMOTIONS. In our frame-semantic approach, we address this relation in such a way that the FE CONTENTS relates to the conceptual metaphor frame EMOTIONS ARE SUBSTANCES. In many corpus examples, *liquids* instantiate SUBSTANCES: Aside from *hochkochen*, other examples from our corpus data include *eruptive Reaktion* ('eruptive reaction'), which draws on the source domain LAVA, and *überbordender Zorn* (lit. 'overboarding wrath') relating to the source domains FLOODS or RIVER.

See Table 1 for an overview of the frames structuring the conceptual metaphor ANGER IS A HOT LIQUID IN A CONTAINER:

This description is hierarchical in such a way that it moves from the generic metaphor EMOTIONS ARE OBJECTS to the specific metaphor ANGER IS A HOT FLUID IN A CONTAINER line by line. It works for every instance of the metaphor ANGER IS A HOT FLUID IN A CONTAINER. Some instances of this metaphor, for example, *Gemüter hochkochen*, may even be more complex. This metaphor interacts with the metaphor BECOMING ANGRY IS MOVING UPWARDS, which is structured by several frames: First, *Motion_directional*, which is in turn structured by the frames *Motion*, *Direction*, and the image-schematic frame *Source_path_goal*.¹² Second, the image-schematic frame *Verticality* because direction can be on a vertical (up versus down) or a horizontal (left versus right) scale. In our example, feelings understood as liquids move upward. Hence, the vertical scale matters. Third, the metaphor relates to *Change_position_on_a_scale*. This metaphor inherits from the image-schematic frame *Scale* that – as mentioned above – turned out to be relevant for the metaphor EMOTION IS HEAT. Specifically, given our example, it is a salient feature of the underlying metaphor that the liquids *get* hot (i.e., they change their position on a scale of temperature). Thus, the focus is rather on a process than on a state; if liquids are boiled too long and get too hot, respectively, during this process, the container will flow over. In addition, an apt understanding and use of the dynamic metaphor BECOMING ANGRY IS MOVING UPWARDS presupposes knowledge of the static metaphor ANGRY IS UP: Only if feeling anger is conceptualized as being

¹¹Examples from our corpus data are *wenn die Angst von innen kommt* ('when fear comes from inside') and *seine Wut ab und an rauslassen* ('leave out one's anger from time to time').

¹²More specifically, the frame *Motion_directional* inherits from the frame *Motion* and its FEs are related to frames: *DIRECTION* to *Direction* and *PATH* to *Source_path_goal*.

located at a high point on a vertical scale, becoming angry can be understood as moving toward this point.

5. ANGRY IS UP and HAPPY IS UP: the polyvalence of scalar source domains

As (20) indicates, some examples attested in the corpus suggest that metaphors that express an undesirable emotional state are located in an upper region of an imaginary vertical space axis. This seems to be in conflict with the HAPPY IS UP metaphor (i.e., one of the most basic emotion metaphors) that also uses UP as a source domain while at the same time its target domain HAPPINESS refers to a desirable emotional state.

- (20) Die meisten Menschen erkennen, wann [_{Experiencer} _{is} _{Theme} ein Gegenüber] [an die Decke zu gehen^{Target}] droht. ('Most people recognize when their vis-à-vis threatens to **hit the roof**)

In the context of (20), the expression *an die Decke gehen* ('hit the roof'; lit. 'go towards the ceiling') evokes the conceptual metaphor frame BECOMING ANGRY IS MOVING UPWARDS that is structured by the source frame *Motion_directional* and the target frame *Anger* (which is not overtly realized here, cf. Section 2). Other instantiations of this metaphor attested in our corpus include *sich aufregen* ('be upset') and its counterpart *sich abregen* ('come down'; lit. 'be downset'). Here, the particles of these particle verbs refer to a movement in a direction: up and down, respectively.

In much of the CMT literature, the expression *hit the roof* is considered an instance of the metaphor ANGER IS HEAT (e.g., Lakoff & Kövecses, 1983) and ANGER IS A HOT FLUID IN A CONTAINER, respectively, as discussed in Section 4. However, unlike in the case of *boil*, the source domain HEAT or HOT LIQUID is not represented at all in *hit the roof*. Of course, as far as the interpretation of this metaphoric expression is concerned, it is quite possible to take into account conceptual knowledge such as 'When the substance in a container becomes too hot, the container explodes' and 'When a container explodes, parts of it go up in the air'. Nonetheless, we argue for an alternative analysis that emphasizes the motion of the experiencer as a source domain; following our analysis, this domain is evoked directly by the expression *hit the roof*.

Reference to directional motion applies to (20) in such a way that the ceiling (which is the literal English equivalent to German *Decke*) in a room is located above the experiencer, that is, to move toward the ceiling means to move upward. Since being or becoming angry (or being or becoming upset) is usually considered a socially undesirable emotional behavior associated with, e.g., loss of control and irrationality, while being happy is arguably an emotional state evaluated as desirable, ANGRY IS UP at first glance seems to be in conflict with HAPPY IS UP. This issue has recently been addressed in a cognitive-linguistic and anthropological study by Wnuk and Ito (2021). In Mlabri, an Austroasiatic language, there are spatial metaphors mapping DOWN onto desirable, and UP onto undesirable emotional experiences. Wnuk and Ito (2021) are pointing out that this mapping can be explained in terms of arousal: In Mlabri, low-arousal states reflect an ideal affect 'centered on contentment and tranquility' (Wnuk & Ito, 2021, p. 213). This seems to apply to German (and English) as well: Reconsidering the expression *an die Decke gehen* and situations in which

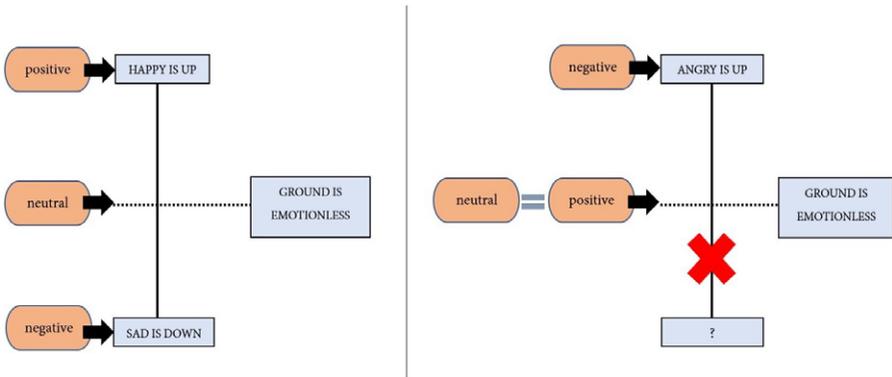


Figure 3. The difference between HAPPY IS UP and ANGRY IS UP in terms of their scalar source domain.

people get angry, verbs like *runterkommen* ('come down') relate to changing an agitated emotional state to a neutral state. In terms of *an die Decke gehen*, this means that if someone has to 'come down' they have to move away from the ceiling and back to the ground. Thus, the ground represents the neutral state that is, in the context of anger, a desirable state, while DOWN maps on a state evaluated as positive.

Note that both metaphors, ANGRY IS UP and HAPPY IS UP, build on the primary metaphor MORE IS UP, which suggests that these metaphors are not in a general conflict. Primary metaphors are described by Grady (1997, p. 47) as 'metaphors which have a direct experiential basis, and which motivate highly predictable sets of data'. For our examples, this means that conceptually it makes no difference if UP is mapped to a positive (HAPPINESS) or negative (ANGER) emotion concept as long as there is an emotion and the experiencer, in metaphorical terms, is located *above* sea level (*sea level* meaning current lack of emotions).

Importantly, both HAPPY IS UP and SAD IS DOWN constitute an opposition pair; in contrast, however, ANGRY IS UP does not have a counterpart. As a result, on the imaginary scale evoked by HAPPY IS UP, the distance between 'positive' and 'negative' differs from the distance between 'positive' and 'negative' on the scale evoked by ANGRY IS UP (see Figure 3).

Following this analysis, the metaphor *being down* relating to sadness means *being underground*. Here, it is the ground that serves as a reference point. In contrast, the metaphor *down* relating to 'having moved away from being angry' means *being on ground* and thus takes a spot above the ground as its reference point. Note that in the first case a state rather than a process is described, while in the latter case a dynamic process is described rather than a state.

6. Conclusion

In this paper, we have introduced a frame-semantic approach to analyze conceptual metaphors. Importantly, the analyses presented here build on lexicographically documented semantic frames, assuming that not only the source and target domains of metaphors are conceptual structures forming frames but are also conceptual metaphors themselves.

The analyses presented here suggest that a frame-semantic approach helps modeling conceptual metaphors in a way that deviates from ‘traditional’ approaches to conceptual metaphors in at least three ways. First, a frame-semantic approach treats language users’ knowledge about conceptual metaphors as an integral part of their semantic knowledge and thus conceives conceptual metaphors as specific frames in their own right, featuring essentially the same characteristics as other types of frames such as lexical frames, which have been the focus of much of the frame-semantic literature. This makes it possible to treat conceptual metaphors and lexical meanings on a par. Second, frame semantics allows for investigating conceptual metaphors including their relations among each other in a systematic way drawing on authentic data. Third, developing a resource that integrates German FrameNet into the German Constructicon allows for exploring relationships between metaphoric expressions, their literal counterparts and the grammatical constructions that help realizing metaphors – an area that still remains vastly underexplored.

The domain of emotion metaphors is arguably one that is particularly well suited for exploring the potential and the limitations of such an approach. The frame-semantic analyses presented in this paper converge in many ways with the analyses that have been proposed in CMT literature. At the same time, they are unique in that they provide a format for systematically modeling the complex interaction of various semantic areas constitutive of conceptual metaphors. For example, based on our small dataset that is limited to a sample of texts from popular science magazines, the results of our analysis suggest that metaphorical expressions tend to come from the source domain of vision on the one hand and the (un-)controllability of physical entities on the other. While metaphors from the vision domain usually relate to the expression of emotions, or the lack thereof, metaphors from the latter target the emotions in question directly. However, distinguishing between both aspects is not easily possible in many cases due to a strong metonymic relation between emotions themselves and their expression. In the case of ANGER metaphors, for instance, metaphors relating anger to heat are arguably motivated by physical correlates of this emotion (see, e.g., Turner & Fauconnier, 2003).

Our analyses also suggest that emotions metaphorically relate to ‘affected’ and ‘passive’ entities, while – less frequently – some metaphors relate to ‘autonomous’ and ‘active’ agents. This variation is reflected by the FEs of the conceptual metaphor frames. The configuration of FEs indicates different perspectives on how we handle and conceive emotions, and which significance we give to them. Drawing on a larger corpus, future research may address to what extent specific emotions ‘prefer’ specific perspectifications. In this context, the conceptualization of emotions in specific discourse domains may also be conclusive (cf., e.g., Neumair’s (2022) frame-semantic emotion metaphor analysis on fleeing and displacement).

In most cases addressed in this paper, source and target frames of conceptual metaphor frames can be adequately described by means of lexically motivated frames documented in the German FrameNet-Constructicon. However, there are also metaphors (and instances of metaphors) where none of these lexical frames fit. For instance, as of now, to account for source domains like UP and DOWN in HAPPY IS UP and SAD IS DOWN, only a highly generic frame is documented in the German FrameNet-Constructicon, namely, the image-schematic frame *Verticality*. However, this frame is radically underspecified and thus may only partially cover the conceptual structure specific to the domains UP and DOWN. As such, it is an important task for future research to investigate to what extent domains of

conceptual metaphors are motivated by lexical frames already documented in the German FrameNet-Construction and to create new frames where this is necessary (and backed by additional lexicographic evidence). Thus, our analysis of conceptual metaphors can also help to make the repository of lexical frames more exhaustive.

Finally, our analysis suggests that using frames for investigating cognitive and mental phenomena like emotions can also help to address the complexity of these phenomena on a more fine-grained level. Frames as operationalized in FrameNet provide a format for modeling the structural complexity of metaphorical concepts by relating different types of frames. For instance, some conceptual metaphor frames turned out to be best explained by taking account of interactions between the lexical frames evoked by specific lexical items or between lexical frames and image-schematic frames. In addition, the complex interaction between conceptual metaphors can be modeled by postulating relationships between conceptual metaphor frames. CoMetNet is still under construction; as soon as it contains a sizeable number of entries, the repository may be used for identifying and exploring metaphors sharing the same source domains, which allows for drawing more far-reaching conclusions about the metaphoric potential of source domains, as well as the nature of metaphoric mappings in general.

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Data availability statement. A full list of URLs to the newspaper articles that constitute our dataset is given in the Supplementary Material.

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