



UNICA

UNIVERSITÀ
DEGLI STUDI
DI CAGLIARI



Università di Cagliari

UNICA IRIS Institutional Research Information System

This is the Author's [*accepted*] manuscript version of the following contribution:

ERVAS F., Metaphor, Ignorance, and the Sentiment of (Ir)rationality, «Synthèse», 198(7), 2021, pp. 6789-6813, online first, 2019. ISSN: 0039-7857 Doi: 10.1007/s11229-019-02489-y (Fascia A)

The publisher's version is available at:

<https://link.springer.com/article/10.1007/s11229-019-02489-y>

When citing, please refer to the published version.

Metaphor, Ignorance and the Sentiment of (Ir)rationality

Abstract

Metaphor has been considered as a cognitive process, independent from the verbal vs. visual mode, through which an unknown conceptual domain is understood in terms of another known conceptual domain. Metaphor might instead be viewed as a cognitive process, dependent from the mode, which leads to genuinely new knowledge via ignorance. First, I argue that there are two main senses of ignorance at stake when we understand a metaphor: 1) we ignore some existing properties of the known domain in the sense that we disregard or neglect them; 2) we ignore some non-existing properties of the known domain as they are not a piece of information belonging to the known domain, but emerge in metaphor interpretation. Secondly, I consider a metaphor as a reasoning device, guiding the interpreters along a path of inferences to a conclusion, which attributes to the target some properties of the source. In this path, interpreters might 1) (re)discover the ignored existing properties of the known domain and/or 2) recover the non-existing properties, inferring or imagining the missing piece of information. Finally, I argue that, especially in visual metaphors, this process is guided by a “sentiment of (ir)rationality”, tracking a disruption of existing familiar conceptualisations of objects and/or actions and a (partial) recovery of ignored properties.

Keywords

Verbal metaphor, Visual metaphor, Framing strategy, Ignorance, Epistemic feelings, Irrationality.

1. Metaphor and the paradox of knowing the unknown through ignorance

Metaphor is a cognitive process through which a generally less known conceptual domain (the *target*) is seen in light of a better known conceptual domain (the *source*) (Lakoff & Johnson 1980; Gibbs 1994; Bowdle & Gentner 2005). In the process, some properties of the known domain are selected to understand some properties of the unknown domain. For instance, in the metaphor “The world is a melting ice cream cone”, the ice cream cone represents the source conceptual domain and the property of being melting is made explicit to better understand a property of our (actual) world, i.e. the target conceptual domain, melting away because of global warming. Even though, when we think of a metaphor, we think of a verbal metaphor, metaphor has been considered first of all as a cognitive process and just secondarily as a linguistic phenomenon: as largely argued by the conceptual theory of metaphor, “metaphor is primarily a matter of thought and only derivatively a matter of language” (Lakoff & Johnson 1980: 153). More recently, a multimodal turn in metaphor theory has extended this view to modalities other than the verbal one (Forceville 1994, 1996; Coëgnarts & Kravanja 2012): if metaphor is primarily conceptual rather than verbal, then it can be given in any other modality. We could therefore have not only verbal metaphors as “The world is a melting ice cream cone” to represent the world melting away as an ice cream cone, but also, for instance, visual (or pictorial) metaphors or multimodal (pictorial) metaphors (see examples in Fig. 1), combining more modalities (Forceville & Urios-Aparisi 2009).

Visual (or pictorial) metaphor	Multimodal pictorial metaphor
	 Melting Away Join Friends of the Earth and help save the planet before it's too late! www.foe.co.uk

Fig. 1 Example of visual (or pictorial) metaphor and multimodal pictorial metaphor (corpus: Pinterest, www.pinterest.it/pin/343821752788169312, Reproduced under fair use).

Visual metaphor, also called pictorial metaphor, is an image in which the source and the target are pictorially presented (or suggested) and compared. Text can accompany a visual metaphor, modulating its meaning and creating a multimodal pictorial metaphor. In a time of visually intensive society, metaphor is pervasively used across modalities, in a variety of communicative contexts. Especially multimodal pictorial metaphors are often used in different genres: advertising, art, social campaigns, political cartoons, etc. (Forceville 1996, 2008; Forceville & Urios-Aparisi 2009; Refaie 2003; Fahlenbrach 2015).

In the monomodal verbal metaphor “The world is a melting ice cream cone” as well as in the multimodal pictorial metaphor in Fig. 1, the property of being melting is made explicit. However, not always a metaphor makes explicit the relevant property; most times interpreters need to infer the propertie(s) that make sense of a metaphor, in order to understand the unknown conceptual domain. They might retrieve the properties from the known conceptual domain and attribute them to the unknown conceptual domain through “mapping” or “parallels”¹. Therefore metaphor interpreters know the unknown target conceptual domain via inference from known properties of the known source conceptual domain. In what follows, I instead argue that most times interpreters use metaphor to know the unknown target via ignorance of the properties of the known source conceptual domain. This might seem a paradox, as it entails a circular argument leading to the logically unacceptable conclusion that interpreters know the unknown via something they do not know. However I support the idea that in metaphor understanding, ignorance might bring to

¹ Studies in fields such as Cognitive Linguistics and Pragmatics takes metaphor to rest on complex mappings between a source and a target (see, e.g., Lakoff & Johnson 1980; Lakoff 1993). However, this is just one main way in which some properties of the source can have *parallels* in the target. As argued by Barnden (2008: 3), we might talk about “parallelism” rather than “isomorphism” or “analogy”, because they imply “a strict one-to-one correspondence between items in the source scenario and items in the target scenario” and this “prejudge the question of whether looser, messier forms of parallelism are sometimes needed”. Indeed, other accounts of metaphor are *not* presented as being based on mappings, but rather on (more or less) loose parallelism, as for instance in Relevance Theory (Sperber & Wilson 1986, 2008, Wilson & Carston 2006; Vega Moreno 2007) and the “class-inclusion” approach (Glucksberg 2008, Glucksberg & Keysar 1990).

genuinely new knowledge, discovering the unknown. First, I argue that there are two main senses of ignorance at stake when we understand a metaphor: 1) we ignore some existing properties of the known source conceptual domain, in the sense that we disregard or neglect them; 2) we ignore some non-existing properties of the known source conceptual domain in the sense that they are not a piece of information of the known source conceptual domain as they emerge in metaphor interpretation. Secondly, I consider metaphor as a reasoning device, guiding the interpreters along a path of inferences to a conclusion, which attributes to the target some properties of the source. In this path, interpreters might 1) (re)discover the ignored existing properties of the known source conceptual domain and/or 2) recover the non-existing properties, inferring or imagining the missing piece of information. Finally, I argue that, especially in visual metaphors, this process is guided by a “sentiment of (ir)rationality” (James 1879), tracking a disruption of existing familiar conceptualisations of objects and/or actions and a (partial) recovery of ignored properties.

2. Metaphor and ignorance of existing properties

As largely pointed out (Entman 1993; Semino 2008; Burgers et al. 2016), metaphor is a framing device with an “ignorance-preserving trait” (Arfini et al. 2018): some relevant properties of the source are selected to understand the target, while other properties of the source remain ignored or underrated. Metaphor, as a figurative framing device, presents the audience with a specific description and/or implicit evaluation of the target, by ignoring some properties of the source and selecting other properties, which become prominent. As pointed out, the framing process is “used relatively more often if knowledge about the problem is lacking in the audience”, especially “when talking about new topics [...] compared to established topics” (Burgers et al. 2016: 13). Metaphor is indeed a way of filtering, discriminating and selecting information that allows us to reduce the overwhelming jumble of information coming from the environment and/or our social world. When in a visual metaphor we put together objects belonging to two different conceptual domains, as the world and the ice cream cone, under the same category, many differences are lost or ignored, as for instance the property of being made of milk. However, when we put the same objects under different categories, many similarities would be lost or ignored, as for instance the property of melting. We might say that any process of conceptualisation involves a *loss of information*, which is in turn responsible for what has been called “framing”. Framing is a cognitive mechanism we use to interpret the world, to reason about it and to make decisions having an impact on it. Indeed, frames provide meaning through a selective process, filtering people's perceptions and concepts. Therefore, metaphors are never “neutral”, because they entail a framing effect, providing a specific perspective from which to “see” the world. The framing effect is not specific to verbal metaphor, but rather to metaphor as a cognitive process, independently from the modality, and therefore entailed also by visual metaphor. When we look at the visual or the multimodal pictorial metaphor in Fig. 1, we “see” the world affected by the global warming through the ice cream cone, as the property of being melting is made relevant and even explicit in the case of the multimodal pictorial metaphor. Other properties, as for instance the “unrealistic” size of the ice cream or the texture of the cone, are ignored as non-relevant to understand the melting world.

When we categorize a phenomenon in a frame, we give meaning to some properties of what is observed, and at the same time we ignore other properties that become non-relevant. This does not mean that we do not know the ignored properties of the source, nor that they are not important. This rather means that we (more or less) unconsciously disregard them or we simply do not consider them, but they might be relevant to understand some other targets, as

for instance in the metaphor “The solar system is a milky ice cream”, or they might even become relevant when looking at the same target from another perspective. This might happen, for instance, when a verbal metaphor is revitalised. Most verbal metaphors are indeed “dead”, expired because of the overuse in a linguistic community, and have a conventional meaning already lexicalised and stored in dictionaries. Just a few metaphors, novel or “live”, seem to involve a completely creative and new use of language. Whereas conventional metaphors are often not recognisable as metaphors, novel metaphors often need a conscious interpretation, requiring a greater effort to discover the relevant properties intended by the speaker (Glucksberg & Estes 2000; Indurkha 2007). Conventional metaphors instead activate widespread schemas of properties associated with the source, “silencing” the properties that are not part of the schemas. The ignored properties are often the literally true properties of the source, while the relevant properties to understand the target are often patently false. As Max Black remarked (1955), to understand a conventional metaphor, such as “Man is a wolf”, an interpreter does not need to know the literal meaning of “wolf”, nor all the true properties an expert might attribute to wolves via sufficiently justified reasons. Rather, she needs to know a “system of associated commonplaces” usually held to be true about wolves in a linguistic community, i.e. the properties of being hungry, fierce, engaged in constant struggle, etc. This system of properties might vary through culture and does not necessarily correspond to the properties the expert associate with the word “wolf”:

From the expert's standpoint, the system of commonplaces may include half-truths or downright mistakes (as when a whale is classified as a fish); but the important thing for the metaphor's effectiveness is not that the commonplaces shall be true, but that they should be readily and freely evoked. (Because this is so, a metaphor that works in one society may seem preposterous in another. Men who take wolves to be reincarnations of dead humans will give the statement “Man is a wolf” an interpretation different from the one I have been assuming). (Black 1955: 287)

The wolf-system of commonplaces guides metaphor interpretation, by constructing a series of inferences about the target “man”. Indeed, as argued by Eva Kittay (1982: 394), through metaphor “we regard one thing in terms of another, and in so doing our understanding of the first is modified in light of perspective gained by the second”. The perspective given to the first (the target conceptual domain) by the second (the source conceptual domain) is never “neutral”, precisely because it is associated with a system of commonplaces.

Especially in the case of conventional metaphors, the process of attributing a “system of associated commonplaces” is not necessarily conscious, but it seems inescapable and seriously affecting reasoning (Thibodeau & Boroditsky 2011, 2013; Semino et al. 2016; Burgers et al. 2016). As Elena Semino wrote, “constructing something in terms of something else results in a particular view of the ‘something’ in question, often including specific attitudes and evaluations” (Semino 2008: 32). For instance, in a series of experiments Thibodeau and Boroditsky (2011, 2013) found that participants were influenced by conventional metaphorical framing in conceptualising and reasoning about possible solutions to crime. When crime was presented as a virus infecting and plaguing a city, they were more prone to suggest social reforms to deal with the problem, while they were more prone to suggest law enforcement and punishment when crime was presented as a beast. The relevant properties of the two different source domains (virus vs. beast) unconsciously forced participants to find two different conclusions for their arguments. However, this does not mean that all metaphors necessarily involve a belief or attitude change, entailing genuinely new knowledge. Indeed most conventional metaphors do not attract people’s attention, but rather they directly and unconsciously activate the associated system of commonplaces. Conventional metaphors are not normally used with the intention to provoke a belief change or to provide genuinely new knowledge, but rather to tacitly share an implicit background of

shared knowledge which makes metaphorical understanding possible. Therefore, in most cases, metaphorical framing simply maintains the “system of associated commonplaces” we usually hold to be true about the source domain, be it the virus or the beast. As noted by Nelson and colleagues (1997: 225), “frames operate by activating information *already at the recipients’ disposal*, stored in long-term memory”. The properties of the “system of associated commonplaces” are indeed well-known and largely shared by the linguistic community.

This process seems independent from the modality of the metaphor: to understand the visual metaphor in Fig. 1, we need to know some basic and widely shared knowledge on ice cream cones, as for instance that they rapidly melts away, especially in warming conditions. On the basis of this shared knowledge, we can make a series of inferences on the target conceptual domain, i.e. the world, and maybe also take some decisions or actions. However, as Burgers and colleagues (2016: 3) claimed, metaphors work both as a framing device due to the “linguistic packing” (referring to *how* something is said) and a reasoning device due to the conceptual content of a frame (referring to *what* is said), which interact foregrounding “a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described” (Entman 1993: 52). From this point of view, we should expect that the specific “visual packing” of a metaphor (referring to *how* it is pictorially represented) as a framing device meaningfully interacts and influences the metaphor as a reasoning device. However, while a long and well-established tradition in metaphor theory has studied the “linguistic packing” a metaphor might have, theoretical studies on visual metaphor are more recent and more focused studies on different possible “visual packings” a metaphor might have are even more recent. Indeed, Virgil Aldrich (1968) first introduced the term “visual metaphor” in art, without providing a taxonomy. John Kennedy (1982) described visual metaphor somewhat as a synonym of “visual figure of speech”, including examples of visual metonymy, personification, pun, etc. Therefore he did not provide a specific taxonomy, i.e. different kind of visual metaphors referring to *how* the metaphor is pictorially represented. Charles Forceville’s pioneering works (1994, 1996) described two main types of visual metaphor: metaphors with one pictorially represented conceptual domain (MP1) and metaphors with two pictorially represented conceptual domains (MP2). More recently, other studies (Phillips & McQuarrie 2004; Maes & Schilperoord 2008) propose different visual metaphors types depending on the ways the source and the target conceptual domains are represented, ranging from *juxtaposition* and *fusion* (in the case of MP2) to *replacement* (in the case of MP1). There is a *pictorial simile* when the source and target domains are represented by juxtaposed objects, a *visual hybrid metaphor* when the objects representing the source and target domains are fused in a single object, a *visual contextual metaphor* when the object representing the source replaces the object representing the target (as in Fig. 2), or vice versa (Forceville 1996, 2008).

Pictorial simile	Hybrid metaphor	Contextual metaphor
		

Fig. 2 Example of juxtaposition (pictorial simile), fusion (hybrid metaphor) and replacement (contextual

metaphor) of the conceptual domains (corpus: Ads of the World, www.adsoftheworld.com, Reproduced under fair use)

Visual metaphor, as a framing device, depends on how the conceptual domain are represented: in a pictorial simile, we know all the properties of the source and the target, as the overall objects are depicted in details. Differently from the verbal simile “The guitar is like an explosion”, the pictorial simile does not present whatever guitar and whatever explosion, but a specific guitar, depicted with specific colours and shape, resembling the colours and the shapes of a specific depicted explosion. The relevant perceptual features to compare are already explicitly suggested by the image, other (existing) features of the objects can be ignored. On the contrary, the hybrid metaphor does not present all the properties of the target: just the shape of the hand is represented and perceptually relevant to interpret the metaphor. All the other properties are ignored in a double sense, in the sense that they are disregarded as non relevant to interpret the metaphor, and in the sense they are not existing or not pictorially represented and therefore the audience cannot know them. In the contextual metaphor, all the properties of the source are given and therefore known, but all the features of the target are ignored, because the object representing the target, i.e. the alarm clock, is not depicted. Therefore no existing property of the source are explicitly suggested by the image for a comparison.

As I will argue, the second sense of ignorance, referring to ignored non-existing properties, requires another approach to metaphor understanding: not only a conceptual access but also an “imagistic access” might be needed to recover the missing piece of information. The possibility of a non-propositional, imagistic access to metaphor has been largely debated in contemporary (verbal) metaphor theory (Davidson 1978; Lepore & Stone 2010, 2015; Carston 2010, 2018; Indurkha 2016), showing how conventional and novel metaphor might differ in this respect. Paradoxically this possibility has been quite neglected in visual metaphor theory, and above all an explanation of how different “visual packings” might influence the imagistic access to metaphor still lacks. I shall argue that the “visual packing” influences metaphor not only as a framing conceptual device, but also as a reasoning device, precisely because it forces the audience to go beyond the conceptual access to metaphor.

3. Metaphor and ignorance of non-existing properties

Appealing to a “unified approach” to literal and non-literal linguistic uses, a process of lexical modulation (lexical narrowing or broadening) was proposed to explain the process of selection of the relevant properties in metaphors (Carston 2002; Recanati 2004, 2010). Metaphorical understanding might then be interpreted as a lexical broadening process, where some properties of the linguistically-encoded concept are selected to understand the communicated “ad hoc” concept (Carston 1997, 2002). For instance, to understand the conventional metaphor “Life is a puzzle”, we select the properties of the linguistically-encoded concept “puzzle” required to grasp the intended ad hoc concept, as for instance the property of “being complex”. Other irrelevant properties of the linguistically-encoded concept “puzzle” (for instance, to be made of cardboard) are suppressed (Glucksberg et al. 2001; Rubio Fernández 2007). The *ad hoc* concept PUZZLE* is therefore derived from the linguistically encoded concept PUZZLE, which might sound contextually inappropriate, in order to satisfy the listener’s expectations of relevance and make sense of the speaker’s utterance. Metaphor results from the interaction among the source and target conceptual domains, but it is not reducible to any comparison between the two (Black 1955). Indeed, a metaphor restructures both the conceptual domains themselves, not only by selecting some existing properties and

ignoring some other properties of the source conceptual domain, but also by emphasizing and (re)organizing them in a new frame. In the process, some properties, non-existing before the interaction of the source with the target conceptual domain, might emerge.

For instance, in conventional metaphors such as “Robert is a bulldozer” or “Sally is a block of ice” (examples from Wilson & Carston 2008), the source conceptual domain “bulldozer” does not include properties such as stubborn and insensitive, nor the source conceptual domain “block of ice” includes properties such as reserved or unresponsive. These emergent properties are not necessarily properties of the target, nor they are properties shared by the source and the target. Therefore, where do these properties come from? They might come from the system of commonplaces associated with the overall metaphor. However, being part of the well-known system of commonplaces, the emergent properties would not be genuinely new knowledge. Novel metaphors are somewhat different from conventional metaphor, because - being a completely new use of language - they have no system of commonplaces already associated with the source domain in relation to the target domain. Could we say that in the case of novel metaphors, emergent properties represent genuinely new knowledge, i.e. properties we truly did not know because they did not exist before connecting the source and the target conceptual domains in a new metaphorical frame? Do novel metaphors entail a belief change based on the acquisition of information not *already at the recipients' disposal* are they “simple” framing strategies as all the other metaphors?

In Gerard Steen’s theory of deliberate metaphor (Steen 2008, 2010, 2013, 2017), especially novel metaphors can change the audience’s beliefs and attitudes, because they “force to look at the target from a different conceptual domain or space” (Steen 2008: 222), thus offering a genuinely new perspective on the target. In his view, indeed, metaphors might not only serve the linguistic function to give a name to experiences which cannot be defined via a literal term (*naming*) and the conceptual function to provide a frame for interpretation (*framing*), but also the communicative function to offer to the audience a genuinely new, alternative perspective on the target of the metaphor (perspective changing). The *perspective changing* function should not be conflated with the *framing* function: while framing is involved in every conceptual structure created by a metaphor, perspective changing occurs just when the speaker *deliberately* uses a metaphor to change, rather than to maintain the addressee’s beliefs and attitudes. Novel metaphors can more easily serve this function, because they force to look at the target from a source domain which is unprecedented or never previously connected to that target, and therefore presenting genuinely new, previously unknown, ignored properties. However, the use of deliberate metaphor in communication can *revitalize* dead metaphors which are usually used as non-deliberate metaphors in communication. The ignored properties of the source domain were not relevant or useful to understand the unknown conceptual domain under a specific perspective, i.e. the perspective provided by the metaphorical frame. However, when the perspective changes, previously ignored properties might become relevant, or previously non-existing properties might emerge.

The emergent properties might be linked either to a conceptual combination of the target and the source domains based on contextual and/or encyclopedic knowledge (Glucksberg & Estes 2000; Wilson & Carston 2006; Vega Moreno 2007), or to the images evoked by metaphor (Davidson 1978; Indurkha 2016; Carston 2010, 2018). In metaphor theory, there has been a heated debate between the view that metaphor is conceptual in nature (Black 1955; Lakoff & Johnson 1980) and the view that it is an image irreducible to concepts (Davidson 1978; Lepore & Stone 2010, 2015). According to the image theory of metaphor, the interpretation of verbal metaphors evokes mental images that produce perception-like experiences. In Donald Davidson’s view, recently reassessed by Ernest Lepore and Matthew Stone (2010, 2015), metaphors have “no other meaning than the literal one” (Davidson 1978: 46), as its purpose is to produce an imagistic effect (White 1996, 2001). Metaphor is thus interpreted as a “seeing-

as” mechanism which leads us to *see* one thing as the other: “metaphor can, like a picture or a bump on the head, make us appreciate some fact but not by standing for, or expressing, the fact” (Davidson 1978: 46). The speaker is therefore not conveying any other message other than the literal one and the further imagistic effect of the metaphor is due to its literal meaning. The Davidsonian view excludes a conceptual route to metaphor understanding, as the evoked images are different in nature from concepts: they are neither coded in linguistic forms (as concepts are), nor they can be reduced to concepts (as conceptual theories did), exactly because they resemble pictures rather than words: “picture is not worth a thousand words, or any other number. Words are the wrong currency to exchange for a picture” (Davidson 1978: 46). Mental images have indeed spatial and physical properties that cannot be completely transferred to propositional structures and linguistic sentences.

Nevertheless, this does not mean that images are literal copies of our visual experience. Mental images are different from both equivalent propositional description and visual experience. They are not “pictures” of what we see nor the effect of the perceptual activity of seeing. Mental images are indeed mental representations accompanied by sensory information without a direct external stimulus, which are recalled from memory and lead to re-experiencing a version (or some novel combination) of the original stimulus (Pearson et al. 2015). In imagery research there has been an ongoing debate, between the propositionalist view that mental images are just another kind of propositional representation and the pictorialist view that mental images are picture-like and thus irreducible to propositional representation (Pylyshyn 2002, Kosslyn et al. 2006). The peculiar “intermediate” nature of mental images allows them to play a creative role in cognitive processes especially when we are in front of unknown or new situations, as they increase the amount of implicit available information, thanks to the possibility of representing information simultaneously, as it happens in visual systems. Words can indeed trigger mental images and “imageability” is precisely defined as the potential of a word to evoke mental images (Paivio 2013; Sadoski & Paivio 2001). However imageability is constrained by our cognitive-perceptual architecture (Pylyshyn 1973; Block 1981): for instance, a triangle can be imagined (even though effects of prototypicality influence the mental image), but a chiliagon cannot be imagined.

The link with visual experience was well known from Ancient Philosophy onwards (in Aristotle’s *Rhetoric*, “metaphor sets a scene before the eyes”). However, the conceptual view has dominated research on metaphor in the last decades, orienting also empirical investigations towards the language-related aspects of metaphor (e.g. Gibbs 1994; Glucksberg 2001; Giora 2003). Interestingly, a recent account claims that in some cases speakers might linger in literal meaning of metaphors and in the evoked mental images, which might prompt new implications and additional non-propositional cognitive effects (Carston 2010, 2018; Wilson & Carston 2019). Robyn Carston (2010) hypothesised an “imagistic” route to metaphor understanding, without excluding the conceptual route to metaphor understanding. While in the case of conventional metaphors, a conceptual route to metaphor understanding is maintained, based on a local pragmatic process of “ad hoc” concept construction and an accidental evocation of mental images, in the case of novel metaphors, the process of metaphor interpretation would keep track of the literal meaning of the source, in a global pragmatic process resulting in a range of communicated imagistic effects. The “imagistic” route does not exclude the conceptual route, but it gives more importance to the evocative power of mental images in metaphor understanding:

I take this second position with regard to the imagistic effects of metaphorical (and other) utterances or texts: images are not communicated but are activated or evoked when certain lexical concepts are accessed and may be further imaginatively developed (by, for instance, shifting mental focus or perspective, zooming in on detail, or forming a connected dynamic sequence) as the conceptual content of the utterance is recovered (Carston 2010: 319).

Carston's view has been confirmed by some empirical studies, showing that the process of metaphor interpretation requires more attentional resources to suppress the corresponding literal meaning and its irrelevant properties when compared to lexical disambiguation (Glucksberg et al. 2001; Rubio Fernandez 2007). Behavioral evidence also showed that subjects heavily rely on mental images when interpreting figurative language (Cacciari & Glucksberg 1995) and especially metaphors (Gibbs & Bogdonovich 1999). In poetic metaphors, emergent properties might precisely come from the details of the evoked mental images. For instance, Eugenio Montale employs metaphors to describe a psychological state, i.e. the "pain of living" (1925), which is hardly translatable in linguistic-propositional structures. Metaphors, such as "the strangled brook that gurgles", "the curling of the shriveled leaf" and "the collapsed horse", are highly creative ways to represent the suffering of being-in-the-world, evoking mental images of common concrete visual (and auditory) experiences. Montale's metaphors exploit some sort of perceptual similarity to convey the metaphorical meaning (Indurkha 2007). The relationship between mental images and metaphor has been highlighted also for visual metaphors (Indurkha 2016; Indurkha & Ojha 2017). Indeed, in Fig. 2, some properties or even the entire object might need to be imagined in order to understand the visual metaphor, as they are not already provided by the images: the sound of the guitar in the pictorial simile, the skin of the hand in the hybrid pictorial metaphor or some properties of the alarm clock (including its sound) in the contextual metaphor. However, behavioural work on visual metaphors, mostly coming from advertising literature (Jeong 2008; Kim et al. 2012; Chang & Yen 2013), reveals a high heterogeneity in materials, poor standardization of types and possible confounding variables, thus not providing a clear understanding of the role of mental imagery in visual metaphor.

4. Verbal metaphor as a reasoning device

Both ignored (but just neglected) existing properties of the source and ignored (but emerging with the metaphor) non-existing properties of the source are fundamental to understand how metaphor can bring to genuinely new knowledge. To this purpose, I consider metaphor as a reasoning device which is not in contrast with neither its being a framing strategy nor its having non-propositional, imagistic effects. Even though also the conception of metaphor as a reasoning device can be traced back to Aristotle, it has been widely criticised in the last decades and it is nowadays quite controversial. It has been claimed that verbal metaphors lead to fallacies of reasoning precisely because of their meaning ambiguity (Barnden 2012; Fischer 2015) and of heuristic rules that never guarantee the preservation of truth (Fischer 2014; Keefer & Landau 2016). In the standard pragmatic view (Grice 1989), sentences featuring a metaphor are indeed considered as patently false, because of their conventional meaning, or as a "semantic anomaly" which urges for the search of the implicit meaning that better fits the context. The majority of sentences with conventional metaphors are indeed perceived as true, even though literally false (Glucksberg 2001, 2003; Giora 2003) and the context availability influences the perception of truth especially in case of novel metaphors (Gildea & Glucksberg 1983; Glucksberg & Estes 2000; Bambini et al. 2016). As previously discussed, it has also been argued that the imagistic aspects of metaphors make it difficult to reduce them to propositional truth-evaluable structures. Moreover, the metaphorical framing effect has been described as a widely automatic, unconscious and obliged process covertly influencing reasoning, which is instead supposed to be a controlled and conscious use of rational justification. The idea of metaphors as a covert force which operates under the domain of awareness, is interpreted as alternative with respect to the notion of reasoning.

We find that metaphors can have a powerful influence over how people attempt to solve complex problems and how they gather more information to make “well-informed” decisions. [...] Interestingly, the influence of the metaphorical framing is covert: people do not recognize metaphors as an influential aspect in their decisions (Thibodeau & Boroditsky 2011: 10).

However, far from being just a source of fallacies in reasoning, metaphors might be helpful means to achieve creative thinking (Holyoak & Thagard 1995; Hofstadter 1995; Hallyn 2000; Indurkha 2010; Castro & Marcos, 2011). Verbal metaphors might indeed be powerful reasoning devices bringing to genuinely new knowledge, precisely because of their being framing strategies and because of their imagistic nature: 1) they have indeed the power to discover new similarities via framing, which do not correspond to prior classifications (Goodman 1976; Kittay 1982; Blackburn 1984; Camp 2006) and they force the audience to find an alternative, new interpretation of the premises that guarantees a conclusion, as shown by Ervas and colleague (2018); 2) they might elicit the emergence of new properties, not associated with the source nor with the target (Fauconnier & Turner 2002; Gineste, Indurkha & Scart 2000; Wilson & Carston 2006), thus entailing new genuine knowledge.

Reconsidering traditional approaches to metaphor as a reasoning device (Black 1962; Hesse 1963, 1965; Perelman & Olbrechts-Tyteca 1969), verbal metaphor has recently been considered a condensed and implicit argument guiding the audience along a path of inferences to a conclusion, which attributes to the target some properties of the source (Macagno & Zavatta 2014; Oswald & Rihs 2014; Wagemans 2016; Ervas, Gola & Rossi 2018). We might represent the metaphorical argument as an enthymeme, such as in the example provided below:

P1: Life is a puzzle

P2: A puzzle is complex

C: Life is complex

where the first premise P1 is explicitly mentioning the conventional metaphor “Life is a puzzle”, and the second premise P2 is implicitly providing the property attributed to the target in the conclusion C. The metaphorical framing of the metaphor might then lead people to apply the properties of the source concept (or the properties belonging to the “system of associated commonplaces”) to the target as the conclusion of an inference, despite the fact that the first premise is false and there is no guarantee that the middle term is used with the same meaning in both premises (i.e. a potential *quaternio terminorum* fallacy). Moreover, as discussed above, conventional metaphors might also be revitalised, when we change the perspective under which we look at the target. In the process of revitalisation, some “non conventional”, previously ignored properties of the source, i.e. properties that do not belong to the system of commonplaces, might be extended through the premises to the conclusion, shifting the meaning of the overall argument. For instance, speakers might look at the target from the point of view of a previously neglected (but existing) property of the source, as in the example provided below:

P1: Life is a puzzle

P2: A puzzle is made of pieces

C: Life is made of pieces

As empirically shown by Ervas and colleagues (2018), especially when the conclusion of the argument is plausible, listeners might revitalise the conventional metaphor in the first premise to justify the conclusion and provide a metaphorical reading of the overall argument. Even though the conclusion does not follow from the premises, participants indeed accepted

the argument as strong, because they believed in the conclusion and tried to offer post-hoc solutions for the logical connection of the premises. In the process, they revitalised the conventional metaphor “life is a puzzle” in the first premise, extending the “non conventional” property of “being made of pieces” through the second premise to the conclusion. The new framing effect entailed by the metaphorical function of perspective changing is so strong that even expertise in argumentation just mitigates it, rather than being an antidote (Ervás et al. 2016).

As argued above, conventional metaphors not necessarily entail a belief change or new genuine knowledge in the audience: they might simply underpin a conclusion already believed as justified, independent from the premises. However, (re)discovering a previously ignored property of the source under which to consider the target, might give a new, fresh perspective on the target itself, emphasising previously unnoticed similarities and escaping from prior, already established classifications. In this sense, even most poetic metaphors might be creative not because of radically novel pairings between different domains, but because of the exploitation of familiar, conventional metaphorical views (Lakoff & Turner 1989), by means of open-ended elaborations and/or compounding (Barnden 2016), i.e. combination of different familiar metaphorical views, as in the example provided below:

A novel is a mirror walking down a road
(Michael Ondaatje, *The English Patient*).

As Deirdre Wilson and Robyn Carston (2006, 2008) argued, even emergent properties can be inferred from conceptual combinations on the basis of encyclopedic knowledge or on the basis of an extension of some properties of the source domain. For instance, the emergent psychological properties of “being reserved or unresponsive” in the conventional metaphorical meaning of “block of ice” might come from an extension of the basic physical properties of the source, such as “being rigid or cold”. However, this is not a “special” process pertaining to metaphor understanding: also conceptual familiar combinations of literal terms, such as “digital watch”, or novel combination, such as “smoky apple”, entail emergent properties, such as, respectively, “rectangular” and “being of bad taste” (Rips 1995; Hampton 1997; Glucksberg & Estes 2000).

Lepore and Stone argued that metaphors cannot be used to make claims and be evaluated for truth, as they are mere invitations to explore comparisons, aiming “to develop imagery and to pursue a shared understanding” (Lepore & Stone 2010: 177). Indeed, examples of inferred emergent properties given by Wilson and Carston (2006, 2008) pertain to conventional metaphors, which have a status similar to polysemous literal term. As argued above, most emergent properties of proper (novel) metaphors are likely to come from the mental images evoked by the literal meaning. It has been indeed shown that rather than to a capacity for inference, in general, an aptitude for metaphor comprehension is correlated to capacity for visualisation (Kaufmann 1979) and, in particular, metaphor understanding might begin with the visualisation of the source (Paivio & Begg 1981). However, we might still argue that metaphors are not only “mere invitation” to develop mental imagery, but they are contentful in virtue of the inferential role they play in reasoning. The emergent properties recovered from the evoked images might still play a role to fill a gap in information or as extra-pieces of information leading to further metaphorical (non-propositional) effects. Indeed, as pointed out by Wilson and Carston (2019):

The communicator's goal is not necessarily to make the addressee believe a determinate set of propositions which can be individually enumerated in the minds of communicator and addressee, but to *alter the addressee's possibilities of thinking*: that is, the range of inferences for which he has evidence, and which he is somewhat more disposed to draw as a result of the ostensive act.

As Peter Lamarque and Stein Olsen pointed out, the aim of a metaphor is precisely to “encourage a hearer to think of, conceive of, reflect on, or imagine one thing (state of affairs, idea, etc) in terms associated with some other thing (state of affairs, etc.) often of a quite different logical type” (Lamarque & Olsen 1994: 360). Of course, a broader notion of inference is needed, including not only logical derivations of conclusions from (more or less explicit) information in the premises, but also information derived from mental imagery.

Information derived from mental imagery, although not mandatory for metaphor comprehension, might enhance metaphor understanding: Mitchell Green (2017) calls these *image-permitting metaphors*, which are interpreted through the lexical modulation process ending with the construction of an “ad hoc” concept proposed in Carston’s first route to metaphor understanding. However, information derived from mental imagery might be necessary to recover ignored properties which are essential to understand a novel verbal metaphor. Green calls these *image-demanding metaphors*, which correspond to “metaphors whose understanding *requires* the construction of a mental image (and this is not restricted to visual imagery)” (Carston 2018: 198), but also for instance to auditory imagery, as in Montale’s metaphors of the pain of living as “the strangled brook that gurgles” or “the curling of the shriveled leaf”. In the second route to metaphor understanding, the evoked images are indeed needed not only to amplify the range of inferences that can be drawn, but also to properly grasp the ignored, missing piece of perceptual information that makes sense of the metaphor itself. In this case, evoked images are mandatory to convey information not included in the conceptual domains involved in the metaphor, playing a role as important as the propositional content. Following the second route to metaphor understanding, the listeners move closer to perception in order to grasp what is lacking in the propositional content.

5. Visual metaphor as a reasoning device and the “sentiment of irrationality”

Also visual metaphors have been described as condensed and implicit arguments (Tseronis & Forceville 2017), which direct the audience’s attention towards certain visual properties, possibly leading to risky inferences (Pollaroli & Rocci 2015). Indeed, visual metaphor interpretation might be influenced by the visual impedance effect, i.e. the fact that irrelevant visual properties might impede reasoning (Knauff & Johnson-Laird 2002). Listeners might indeed stick to visual details unnecessary to grasp the conclusion the visual metaphor would lead them to draw. Previous studies claimed that there cannot be visual arguments at all, because images are vague and ambiguous. However also verbal arguments might present vague or lexical ambiguous language, as precisely in the case of metaphors. It was also claimed that images have no “syntactical arrangements” and “cannot say no” (Fleming 1996; Blair 1996; Johnson 2003), but this criticism might just represent an hegemony of the verbal mode, applying the linguistic categories as well as the propositionality of “verbal thinking” to visual argumentation. Translating the visual argument into a verbal one would indeed produce an argument which simply fails to give the same insight of the hybrid pictorial metaphor in Fig. 1:

P1: The world is an ice cream cone.

P2: An ice cream cone is melting away

C: The world is melting away.

In more recent times, scholars in visual argumentation proposed specific categories for

“visual thinking” and argued that, as for other kinds of visual, some metaphors are “flags”, i.e. they only catch our attention and direct us to a verbal message, while some are genuinely argumentative (Tseronis & Forceville 2017), i.e. they give us a reason for concluding that we should think or do what they want us to think or do (Birdsell & Groarke 2007).

As I shall point out in what follows, there are three main problems to consider visual metaphor as a condensed and implicit argument. However, visual metaphor might be considered a creative and productive reasoning device precisely in the process of solving these problems, specifically connected to its visual nature. First of all, as it pointed out by Charles Forceville (1994, 1996), to interpret a visual metaphor, we need to know whether there are two conceptual domains. The problem has been first raised by Noel Carroll (1994: 198), who argued that the necessary condition for visual metaphor is a visual device called *homospatality*, i.e. the physical co-impossibility of the two discrete entities occupying the same space. In Carroll’s view, homospatality “serves to link disparate categories in visual metaphors physically in ways that are functionally equivalent to the ways that disparate categories are linked grammatically in verbal metaphor”. The creativity of visual metaphor might precisely come from “homospatial thinking” (Rothenberg 1979; Rothenberg & Sobel 1980), which forces the viewers to actively conceive the entities representing the metaphor’s source and the metaphor’s target in a new spatial whole, as for instance in the visual hybrid metaphor of the world fused with the ice cream cone in Fig. 1. Forceville (2002) convincingly argued against Carroll that homospatality is not a necessary condition for visual metaphor. For instance, in the contextual visual metaphor in Fig. 2, representing a cactus on a bedside table, there is no homospatality and we might even wonder whether there are two conceptual domains involved in interpretation. Secondly, we should understand the directionality of the metaphor, identifying the target and source domains: while the directionality of a verbal metaphor depends on its grammatical structure, as for instance in metaphors of the form “A is B”, where the first term represents the target and the second term represents the source, the directionality of visual metaphor is underdetermined by its visual structure. However contextual cues and/or the genre where visual metaphors occur provide information to identify the source and the target. For instance, in the interpretation of the hybrid visual metaphor in Fig. 2, knowing that the image is promoted by a Unicef social campaign for the World Food Day, is crucial to determine the directionality of the metaphor. It is even more crucial in the contextual metaphor in Fig. 2, where knowing that the image is an advertisement of the alarm clock, is required not only to infer that there are two conceptual domains, but also that the alarm clock is the target of the metaphor, even though not depicted in the image. Thirdly, we need to infer or imagine the properties of the source domain that should be attributed to the target.

Previous empirical studies showed that, in visual metaphor understanding, the greater cognitive effort leads to higher persuasion, but up to an optimal point: when the cognitive effort employed to understand the visual metaphor is too high, the viewer might desist from metaphor interpretation (van Mulken et al. 2010, 2014). The verbal anchoring in multimodal pictorial metaphors, such as the text “Melting away” in Fig. 1, increases comprehension (Phillips 2000) and does not reduce persuasion: instead, it forces the viewer to look for alternative interpretations of visual metaphors to reach the intended message. Some studies targeted visual metaphors, arguing that they are more conceptually complex than verbal metaphors due to an “image incongruence” (Perez Sobrino 2016). Indeed, as I will further argue, the typical image incongruence of visual metaphor is based on a disruption of existing familiar conceptualisations of objects and/or actions as represented in the images. However, some studies also showed that the resolution of the image incongruence makes visual metaphor more rewarding, creative and persuasive than verbal metaphor (Jeong 2008; Kim et al. 2012), as it is based on the ability to discover perceptually similar features between

conceptual domains (Indurkha 2010; Indurkha & Ojha 2013; Van Weelden et al. 2011). The feeling of reward is made manifest by a sort of “aha” moment in visual metaphor understanding, which has been described as “solving the riddle” (El Refaie 2003; Steen 2018). Where does this “aha moment” come from? And how to recognize that a (rational) solution for image incongruence has been achieved, without letting it slip through ignorance?

In William James’ terms, certain subjective marks (feeling of ease, relief or even pleasure) signal and accompany the “transition from a state of puzzle and perplexity to rational comprehension” (James 1879: 317). In visual metaphors, the “aha” moment might come from a conceptual solution for the perceptual incongruence of images, which questions our familiar ways of thinking objects and/or actions, and raises a “sentiment of (ir)rationality” (James 1879). In contemporary terms, it would be possible to describe the “sentiment of (ir)rationality” as an epistemic or noetic feeling, which provides judgements with “information that it would have been difficult, perhaps impossible, to acquire through other epistemic means, such as perception, memory, and inference” (Dokic 2012: 302). The sentiment of (ir)rationality is a kind of epistemic feeling based on an implicit evaluation of the *processing fluency*:

Just as we feel no particular pleasure when we breathe freely, but a very intense feeling of distress when the respiratory motions are prevented; so any unobstructed tendency to action discharges itself without the production of much cogitative accompaniment, and any perfectly fluent course of thought awakens but little feeling. But when the movement is inhibited or when the thought meets with difficulties, we experience a distress which yields to an opposite feeling of pleasure as fast as the obstacle is overcome. It is only when the distress is upon us that we can be said to strive, to crave, or to aspire. (James 1879: 317)

Epistemic feelings shape and guide our theoretical and practical reasoning by tracking norms such as adequacy, truth or correctness (Proust 2013). The sentiment of irrationality signals a change in the viewer’s “possibilities of thinking” and urges for a search of information to “fill the gap” and to achieve a sentiment of rationality. In visual metaphors, this epistemic feeling is not very much associated with (aesthetic) pleasure, but rather to conceptual fluency. The disruption of familiar conceptualisation of objects and/or actions caused by image incongruence is a breakdown in a shared basic set of beliefs, which makes understanding possible. As pointed out by Davidson (1993: 297):

We can explain and understand irrationality only against a background of rationality, a background that each of us must, as an interpreter, supply for himself. There is no fixed lists of standards, no eternal hierarchy of values, to which we all must subscribe, but some norms are so basic to intelligibility that we cannot avoid shaping thoughts to their patterns.

In Davidson’s philosophy, the interpretive Principle of Charity is a methodological presupposition that “does not make it impossible to attribute irrational thoughts and actions to an agent, but it does impose a burden on such attributions” (Davidson 1985: 159). This “burden” imposes a rational pressure which calls for a reinterpretation or a search for further information that makes sense of the conceptual disruption. The breakdown might be caused not only a) by a homospatial trait of the visual metaphor (Carroll 1994), as for instance in Fig. 3a) where a cigarette and a bullet are fused and occupy the same space, but also b) by a *suspension of the (intended) functionality* of an object, as in the case of the screwdriver with a handcrafted precision in Fig. 3b), c) by an *unexpected affordance* of an action, as in the case of the hands embracing a tree instead of the pregnant belly in the social campaign for the environmental day in Fig. 3c), or d) by a combination of causes, as in the alarm clock advertisement in Fig. 3d), where the hand searching to switch off the alarm clock finds the embers on the bedside table.

a) Homospatiality	b) Suspension of functionality	c) Unexpected affordance	d) Combined causes
			

Fig. 3 Causes of familiar conceptual disruption in visual metaphors (corpus: Ads of the World, www.adsoftheworld.com, Reproduced under fair use)

Familiar conceptualisation involves a loss of information and reflects prior goals and/or values of the viewer: information lost is not relevant to these goals. However, for some new problem, this lost information may become crucial. Re-conceptualisation mechanisms make it possible to (partially) recover this lost information in a reasoning process leading to achieve a solution for the conceptual breakdown. In this process, we might resort to evoked images to recover lost or missing information, even though - when compared to the mental images evoked by verbal metaphors - they might be more constrained by the perceptual images and their specific features, depending on the kind of visual metaphor. For instance, the contextual metaphors in Fig. 2/3d) and in Fig. 3c) are *image-demanding metaphors*, because they require to imagine not only the objects representing respectively the target (the alarm clock) and the source (the pregnant belly), but also the metaphorical actions of switching off the alarm clock (instead of literally touching the cactus or the embers) and of caressing the pregnant belly (instead of literally embracing the tree). The hybrid metaphor in Fig. 1 is instead an example of *image-demanding metaphor* for a specific property rather than an entire object, because the property of melting needs to be imagined through the melting of the ice-cream, to understand the visual metaphor. However it might be also an *image-permitting metaphor*, because a possible action to save the earth (instead of the melting ice-cream) is not required to understand the visual metaphor, but it would broaden the range of metaphorical effects as well as the addressee's possibilities of thinking. Differently from visual metaphors, pictorial similes would instead be just *image-permitting*, because a comparison of already depicted properties is suggested in Fig. 2 and the missing property of the sound would not be crucial to the pictorial simile understanding.

The mechanism of de-conceptualisation is cognitively difficult because it requires some cognitive effort to move closer to perception, to imagine the relevant properties and to “see” an object through a perceptually incongruent image instead of via familiar conceptualisation (Stojanov & Indurkha 2014). In William James’ words:

The attribute picked out may be *per se* most uninteresting and familiar, but if things superficially very diverse can be found to possess it buried within them and so be assimilated with each other, the mind feels a peculiar and genuine satisfaction. [...] They may be simply *associated* properties, with, for aught we see, no inwardly necessary bond, coupled together as empirically as the colour of a man's eyes with the shape of his nose (James 1879: 327).

The difficulties of reconceptualisation, as well as the (partial) recovery of ignored information, are tracked by the sentiment of (ir)rationality. The “aha” moment is therefore not a moment, but a reasoning process through which genuinely new knowledge is achieved via resolution of the conceptual breakdown signalled by the sentiment of irrationality. The

“aha” is the manifestation of the sentiment of rationality.

5. Conclusion

Metaphor has been described as a framing device with an “ignorance-preserving trait” (Arfini et al. 2018): in metaphor interpretation some properties of the source are selected and become dominant, while others are ignored and remain hidden. I presented metaphor as a reasoning device through which this “ignorance-preserving trait” leads to genuinely new knowledge. Indeed, in both verbal and visual metaphor understanding, ignorance might play a double role: on the one hand, previously neglected existing properties of the source domain might be rediscovered to look at the target from an unprecedented perspective; on the other hand, completely unknown, previously non-existing properties emerge in metaphorical interpretation. Two routes lead to new knowledge in metaphor understanding: the first route leads to discover new emerging properties by an inferential mechanism of extension of some existing properties of the source, the second route leads to maintain the literal meaning to evoke mental images providing perceptual details, which might also produce further non-propositional effects in metaphor interpretation. Following Green (2017) and Carston (2018) distinction between image-permitting metaphors and image-demanding metaphors, I argued that especially in novel metaphors mental images are required to recover the ignored properties emerging in metaphor interpretation, providing a non-propositional contribution to metaphor understanding which might be as crucial as the propositional contribution.

I finally argued that also visual metaphor might act as a reasoning process, though the reasoning process in the visual mode presents peculiar traits. Indeed, differently from verbal metaphor, visual metaphor presents an image incongruence which raises a sentiment of irrationality (James 1879), due not only to homospatiality (Carroll 1994), but also to a suspension of functionality of an object or a unexpected affordance of an action. The sentiment of irrationality is an epistemic or noetic feeling (Dokic 2012), which guides reasoning by tracking the disruption of familiar, previously well-known conceptualisation of objects and/or actions in the world and the (partial) recovery of ignored properties. In visual metaphors, the reasoning process cannot be described as “solving the riddle”, because it consists in going through three problems: 1) identifying the two conceptual domains; 2) understanding the directionality of the metaphor and 3) attributing some properties of the source to the target. Precisely in solving these problems, visual metaphor acts as a reasoning device, which might resort to mental images to recover not only specific properties to attribute to the target, but also entire objects and/or actions, finally leading to a feeling of relief, or an “aha” moment as a manifestation of the sentiment of rationality. We might still wonder whether reasoning with visual metaphors really comes to an end, to a full sentiment of rationality. Visual metaphor interpretation might be open-ended precisely because the “sentiment of irrationality” is anyway still there, in image incongruence, which might call for further possible search of alternative interpretations or imagined information to cope with ignorance.

References

- Aldrich, V. C. (1968). Visual metaphor. *Journal of Aesthetic Education* 2, 73-80.
- Arfini, S., Casadio, C., and Magnani, L. (2018). Ignorance-Preserving Mental Models Thought Experiments as Abductive Metaphors. *Found Sci.* 1-19.
- Bambini, V., Bertini, C., Schaeken, W., Stella, A., and Di Russo, F. (2016). Disentangling metaphor from context: an ERP study. *Front. Psychol.* 7:559.

- Barnden, J. A. (2016). Communicating exibly with metaphor: A complex of strengthening, elaboration, replacement, compounding and unrealism. *Review of Cognitive Linguistics* 14(2), 442-473.
- Birdsell, D. S., and Groarke, L. (2007). Outlines of a theory of visual argument. *Argumentation and Advocacy* 43: 103-113.
- Barnden, J. A. (2008). Unparalleled Creativity in Metaphor. In Creative Intelligent Systems: Papers from 2008 AAAI Spring Symposium (Dan Ventura, Mary Lou (Dan Ventura, Mary Lou Maher & Simon Colton, Cochairs).
- Barnden, J. A. (2012). Metaphor and simile: fallacies concerning comparison, ellipsis, and inter-paraphrase. *Metaphor Symb.* 27, 265-282.
- Black, M. (1955). Metaphor. *Proc. Aristotelian Soc.* 55, 273-294.
- Black, M. (1962). *Models and Metaphors*. Ithaca, NY: Cornell University Press.
- Blackburn, S. (1984). *Spreading the Word*. Oxford: Oxford University Press.
- Blair, J. A. (1996). The possibility and actuality of visual argument. *Argumentation and Advocacy*, 43, 103-113.
- Block, N. (ed.) (1981) *Imagery*. Cambridge: MIT Press.
- Bowdle, B. F., and Gentner, D. (2005). The career of metaphor. *Psychol. Rev.* 112, 193-216.
- Burgers, C., Konijn, E. A., and Steen, G. J. (2016). Figurative Framing: Shaping Public Discourse Through Metaphor, Hyperbole, and Irony. *Communication Theory*, 1-21.
- Cacciari, C., and Glucksberg, S. (1995). Understanding idioms: Do visual images reflect figurative meanings? *European Journal of Cognitive Psychology*, 7(3), 283-305.
- Camp, E. (2006). Metaphor and that certain je ne sais quoi. *Philosophical Studies*, 129, 1-25.
- Carroll, N. (1994). Visual metaphor. In: Jaakko Hintikka, ed., *Aspects of metaphor*. Dordrecht: Kluwer, 189-218.
- Carston, R. (1997). Enrichment and loosening: complementary processes in deriving the proposition expressed? *Linguistische Berichte* 8, 103-127.
- Carston, R. (2002). *Thoughts and Utterances: The Pragmatics of Explicit Communication*. Oxford: Blackwell.
- Carston, R. (2010). Metaphor: ad hoc concepts, literal meaning and mental images. *Proc. Aristotelian Soc.* 110, 295-321.
- Carston, R. (2018). Figurative Language, Mental Imagery and Pragmatics. *Metaphor & Symbol* 33:3, 198-217.
- Castro, S. J., and Marcos, A. (eds). (2011). *The Paths of Creation*. Bern: Peter Lang.
- Chang, C., and Yen, C. (2013). Missing Ingredients in Metaphor Advertising: The Right Formula of Metaphor Type, Product Type, and Need for Cognition. *Journal of Advertising* 42, 80-94.
- Coëgnarts, M., and Kravanja, P. (2012). From Thought to Modality: A Theoretical Framework for Analysing Structural-Conceptual Metaphors and Image Metaphors in Film. *Image & Narrative* 13(1).
- Davidson, D. (1978). What metaphors mean. *Crit. Inq.* 5, 31-47.
- Davidson, D. (1985). *Thought and Talk*. In *Inquiries into Truth and Interpretation*. Oxford: Clarendon Press, 155-170.
- Davidson, D. (1993). *Locating Literary Language*, in R.W. Dasenbrock (ed.), *Literary Theory After Davidson*. University Park, Pennsylvania University Press, 295-308.
- Dokic, J. (2012). Seeds of self-knowledge: noetic feelings and metacognition. In M. Beran, J. Brandl, J. Perner, and J. Proust (eds.), *The Foundations of Metacognition*. Oxford University Press: 302-321.
- Entman, R.M. (1993). Framing: Toward Clarification of a Fractured Paradigm. *Journal of Communication* 43(4): 51-58.
- Ervas, F., Ledda, A., and Pierro, A., *Does Expertise Favour the Detection of the Metaphoric Fallacy?* In L. Bonelli, S. Felletti, F. Paglieri (eds.), *The Psychology of Argument*. Studies in Logic and Argumentation Series 59, London: London College Publication, 223-243.
- Ervas F., Gola E., Rossi M.G. (2018) Argumentation as a Bridge Between Metaphor and Reasoning. In: Oswald S., Herman T., Jacquin J. (eds) *Argumentation and Language — Linguistic, Cognitive and Discursive Explorations*. Argumentation Library, vol 32. Springer, Cham, 153-170.
- Ervas, F., Ledda, A., Ojha, A., Pierro, G. A. and Indurkha, B. (2018). Creative Argumentation: When and Why People Commit the Metaphoric Fallacy. *Front. Psychol.* 9:1815.
- Fahlenbrach, K. (Ed.). (2015). *Embodied metaphors in film, television, and video games: Cognitive approaches*. New York: Routledge.
- Fauconnier, G., and Turner, M. (2002). *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities*. New York, NY: Basic Books.
- Fischer, E. (2014). Philosophical intuitions, heuristics, and metaphors. *Synthese* 191, 569-606.
- Fischer, E. (2015). Mind the metaphor! A systematic fallacy in analogical reasoning. *Analysis* 75, 67-77.
- Fleming, D. (1996). Can pictures be arguments? *Argumentation and Advocacy* 33(1), 11-22.
- Forceville, C. (1994). Pictorial metaphor in advertisements. *Metaphor and Symbol*, 9(1), 1-29.
- Forceville, C. (1996). *Pictorial Metaphor in Advertising*. London: Routledge.

- Forceville, C. (2002). The identification of target and source in pictorial metaphors. *Journal of pragmatics* 34 (1), 1-14.
- Forceville, C. (2008). Metaphors in pictures and multimodal representations. In R.W.Jr. Gibbs (Ed.), *The Cambridge Handbook of Metaphor and Thought* (pp. 462-482). Cambridge: Cambridge University Press.
- Forceville, C., and Urios-Aparisi, E. (2009). *Multimodal Metaphor*. Berlin/New York: Mouton de Gruyter.
- Gibbs, R. W. (1994). *The Poetics of Mind: Figurative Thought, Language and Understanding*. Cambridge: Cambridge University Press.
- Gibbs, R. W., and Bogdonovich, J. (1999). Mental imagery in interpreting poetic metaphor. *Metaphor and Symbol* 14(1), 37-44.
- Gildea, P., and Glucksberg, S. (1983). On understanding metaphor: the role of context. *J. Verbal Learn. Verbal Behav.* 22, 577-590.
- Gineste, M. D., Indurkha, B., and Scart, V. (2000). Emergence of features in metaphor comprehension. *Metaphor Symb.* 15, 117-135.
- Giora, R. (2003). *On Our Mind: Salience, Context and Figurative Language*. Oxford: Oxford University Press.
- Glucksberg, S. (2001). *Understanding Figurative Language: From Metaphors to Idioms*. Oxford: Oxford University Press.
- Glucksberg, S. (2003). The psycholinguistics of metaphor. *Trends Cogn. Sci.* 7, 92-96.
- Glucksberg, S., and Estes, A. (2000). Feature accessibility in conceptual combination: effects of context-induced relevance. *Psychon. Bull. Rev.* 7, 510-515.
- Glucksberg, S., and Keysar, B. (1990). Understanding metaphorical comparisons: beyond similarity. *Psychol. Rev.* 97, 3-18.
- Glucksberg, S., Newsome, M. R., and Goldvarg, Y. (2001). Inhibition of the literal: filtering metaphor-irrelevant information during metaphor comprehension. *Metaphor Symb.* 16, 277-298.
- Goodman, N. (1976). *Languages of art: An approach to a theory of symbols*. Indianapolis: Hackett.
- Green, M. (2017). Imagery, expression, and metaphor. *Philosophical Studies*, 174, 33-46.
- Grice, P. (1989). *Studies in the Ways of Words*. Cambridge, MA: Harvard University Press.
- Hallin, F. (ed.). (2000). *Metaphor and Analogy in Sciences*. Dordrecht: Kluwer Academic Publishers.
- Hampton, J. (1997). Emergent attributes in combined concepts. In T. Ward, S. Smith and J. Vaid (eds.), *Creative Thought: An Investigation of Conceptual Structures and Processes*. Washington DC: American Psychological Association, 83-110.
- Hesse, M. (1963). *Models and Analogies in Science*. London: Sheed and Ward.
- Hesse, M. (1965). Aristotle's logic of analogy. *Philos. Q.* 15, 328-340.
- Hofstadter, D. (1995). *The Fluid Analogies Research Group: Fluid Concepts and Creative Analogies*. New York, NY: Basic Books.
- Holyoak, K. J., and Thagard, P. (1995). *Mental Leaps: Analogy in Creative Thought*. Cambridge, MA: The MIT Press.
- Indurkha, B. (2006). Emergent representations, interaction theory and the cognitive force of metaphor. *New Ideas Psychol.* 24, 133-162.
- Indurkha, B. (2007). "Creativity in interpreting poetic metaphors," in *New Directions in Metaphor Research*, ed. T. Kusumi (Tokyo: Hitsuji Shobo), 483-501.
- Indurkha, B. (2010). "On the role of metaphor in creative cognition," in *Proceedings of the International Conference on Computational Creativity: ICC-C-X*, eds D. Ventura, A. Pease, R. Peirez, G. Ritchie, and T. Veale (Coimbra: University of Coimbra), 51-59.
- Indurkha, B., and Ojha, A. (2013). An Empirical Study on the Role of Perceptual Similarity in Visual Metaphors and Creativity, *Metaphor and Symbol*, 28:4, 233-253.
- Indurkha, B., and Ojha, A. (2017). Interpreting visual metaphors: Asymmetry and reversibility. *Poetics Today*, 38(1), 93-121.
- James, W. (1879). The Sentiment of Rationality. *Mind* 4 (15):317-346.
- Jeong, S. H. (2008). Visual metaphor in advertising: Is the persuasive effect attributable to visual argumentation or metaphorical rhetoric?. *Journal of Marketing Communications*, 14(1), 59-73.
- Johnson, R. H. (2003). Why 'visual arguments' aren't arguments. *Informal logic* 25, 1-13.
- Kaufmann, G. (1979). *Visual imagery and its relation to problem solving*. Oslo: Universitetsforlaget.
- Keefer, L. A., and Landau, M. J. (2016). Metaphor and analogy in everyday problem solving. *Wiley Interdiscip. Rev. Cogn. Sci.* 7, 394-405.
- Kennedy, John M. (1982). Metaphor in pictures. *Perception* 11, 589-605.
- Kim, J., Baek, Y., and Choi, Y. H. (2012). The structural effects of metaphor-elicited cognitive and affective elaboration levels on attitude toward the ad. *Journal of Advertising*, 41(2), 77-96.
- Kittay, E.F. (1982). The creation of similarity: A discussion of metaphor in light of Tversky's theory of similarity. *Proceedings of the Biennial Meeting of the Philosophy of Science Association*, Chicago, University of Chicago Press, 394-405.

- Knauff, M., and Johnson-Laird, P. N. (2002). Visual imagery can impede reasoning. *Memory & Cognition*, 30, 363-371.
- Kosslyn, S.M., Thompson, W.L., and Ganis, G. (2006). *The Case for Mental Imagery*. New York: Oxford University Press.
- Lakoff, G. 1993. The Contemporary Theory of Metaphor. In A. Ortony (Ed.), *Metaphor and Thought*, 2nd ed., 202–251. New York: Cambridge Univ. Press.
- Lakoff, G. (2004). *Don't Think of an Elephant! Know Your Values and Frame the Debate*. White River Junction, VT: Chelsea Green Publishing.
- Lakoff, G., and Johnson, M. (1980). *Metaphors We Live By*. Chicago, IL: University of Chicago Press.
- Lakoff, G., and Turner, M. (1989). *More an Cool Reason: A Field Guide to Poetic Metaphor*. Chicago: University of Chicago Press.
- Lamarque, P., and Olsen, S. (1994). *Truth, fiction, and literature: A philosophical perspective*. Oxford: Clarendon Press.
- Lepore, E. and Stone, M. (2010). Against metaphorical meaning. *Topoi*, vol 29, pp. 165-180.
- Lepore, E., and Stone, M. (2015). *Imagination and convention: Distinguishing grammar and inference in language*. Oxford University Press.
- Macagno, F., and Zavatta, B. (2014). Reconstructing metaphorical meaning. *Argumentation* 28, 453-488.
- Maes, A., and Schilperoord, J. (2008). Classifying visual rhetoric: Conceptual and structural heuristics. In E. McQuarrie, B. Phillips (eds.), *Go figure new directions in Advertising Rhetoric*. Armonk: M.E. Sharpe, 227-253.
- Mercier, H., Sperber, D. (2017). *The Enigma of Reason. A New Theory of Human Understanding*. Cambridge, MA: Harvard University Press.
- Nelson T.E., Oxley Z.M., and Clawson R.A. (1997). Toward a psychology of framing effects. *Political Behavior* 19(3), 221-246.
- Oswald, S., and Rihs, A. (2014). Metaphor as argument: rhetorical and epistemic advantages of extended metaphors. *Argumentation* 28, 133–159.
- Paivio, A. (2013). *Imagery and verbal processes*. New York: Psychology Press.
- Paivio, A., and Begg, I. (1981). *Psychology of Language*. Prentice-Hall: Englewood Cliffs.
- Pearson, J., Naselaris, T., Holmes, E.A., Kosslyn, S.M. (2015). Mental Imagery: Functional Mechanisms and Clinical Applications. *Trends in Cognitive Sciences* 29: 590-602.
- Perelman, C., and Olbrechts-Tyteca, L. (1969). *The New Rhetoric: A Treatise on Argumentation*. Notre Dame: University of Notre Dame Press.
- Pérez-Sobrino, P. (2016). Multimodal Metaphor and Metonymy in Advertising: A Corpus-Based Account, *Metaphor and Symbol*, 31:2, 73-90.
- Phillips, B. J. (2000). The Impact of Verbal Anchoring on Consumer Response to Image Ads. *Journal of Advertising* 29(1), 15-24.
- Phillips, B. J., and McQuarrie, E. F. (2004). Beyond visual metaphor: A new typology of visual rhetoric in advertising. *Marketing Theory* 4, 113-136.
- Pollaroli, C., Rocci, A. (2015). The argumentative relevance of pictorial and multimodal metaphor in advertising. *Journal of argumentation in context* 4(2), 158-199.
- Proust, P. (2013). *Philosophy of Metacognition: mental agency and self-awareness*. Oxford: Oxford University Press.
- Pylyshyn, Z. W. (1973). What the Mind's Eye Tells the Mind's Brain: A Critique of Mental Imagery. *Psychological Bulletin* 53, 1-24.
- Pylyshyn, Z. W. (2002). Mental Imagery: In Search of a Theory. *Behavioral and Brain Sciences* 25, 157-237.
- Recanati, F. (2004). *Literal Meaning*. Cambridge: Cambridge University Press.
- Recanati, F. (2010). *Truth-Conditional Pragmatics*. Oxford: Oxford University Press.
- Refaie, E. E. (2003). Understanding visual metaphor: The example of newspaper cartoons. *Visual communication*, 2(1), 75-95.
- Rips, L. (1995). The Current Status of Research on Concept Combination. *Mind & Language* 10, 72-104.
- Rothenberg, A. (1979). Homospatial thinking in creativity. *Archives of General Psychiatry* 33(1): 17-26.
- Rothenberg, A., and Sobel, R. S. (1980). Creation of literary metaphors as stimulated by superimposed versus separated visual images. *Journal of Mental Imagery* 4(1), 77-91.
- Rubio Fernandez, P. (2007). Suppression in metaphor interpretation: differences between meaning selection and meaning construction. *J. Semant.* 24, 345–371.
- Sadoski, M., and Paivio, A. (2001). *Imagery and text*. Mahwah, NJ: Lawrence Erlbaum.
- Santibáñez, C. (2010). Metaphors and argumentation: the case of Chilean parliamentary media participation. *J. Pragmat.* 42, 973–989.
- Semino, E. (2008). *Metaphor in discourse*. Cambridge: Cambridge University Press.

- Semino, E., Demjen, Z., and Demmen, J. (2016). An integrated approach to metaphor and framing in cognition, discourse, and practice, with an application to metaphors for cancer. *Appl. Linguist.* amw028, 1–22
- Sperber, D. and Wilson, D. (1986). *Relevance: Communication and Cognition*. Oxford, UK: Blackwell.
- Sperber, D. and Wilson, D. (2008). A deflationary account of metaphors. In R. Gibbs (ed.), *Handbook of Metaphor and Thought*. Cambridge: Cambridge University Press, 84–105.
- Steen, G. J. (2008). The paradox of metaphor: Why we need a three-dimensional model for metaphor. *Metaphor and Symbol* 23(4), 213–241.
- Steen, G. J. (2010). When is metaphor deliberate? In N.L. Johannesson, C. Alm- Arvius, D.C. Minugh (eds.), *Selected papers from the 2006 and 2007 Stockholm Metaphor Festivals*, Stockholm, University of Stockholm 2010, 109–127.
- Steen, G. J. (2013). Deliberate metaphor affords conscious metaphorical cognition. *Journal of Cognitive Semiotics* 5(1-2), 179–197.
- Steen, G. J. (2017). Deliberate Metaphor Theory: Basic assumptions, main tenets, urgent issues. *Intercultural Pragmatics* 14(1): 1–24.
- Stojanov, G., and Indurkha, B. (2014). Perceptual Similarity and Analogy in Creativity and Cognitive Development. *Studies in Computational Intelligence* 548: 371–395.
- Thibodeau, P. H., and Boroditsky, L. (2011). Metaphors we think with: the role of metaphor in reasoning. *PLoS One* 6:e16782.
- Thibodeau, P. H., and Boroditsky, L. (2013). Natural language metaphors covertly influence reasoning. *PLoS One* 8:e52961.
- Tseronis , A., and Forceville, C. (2017). *Multimodal Argumentation and Rhetoric in Media Genres*. Amsterdam: Benjamins.
- Van Mulken, M., le Pair, R., and Forceville, C. (2010). The impact of complexity on the appreciation of visual metaphors in advertising across three European countries. *Journal of Pragmatics*, 42, 3418–3430.
- Van Mulken, M., van Hooft, A., and Nederstigt, U. (2014). Finding the tipping point: Visual metaphor and conceptual complexity in advertising. *Journal of Advertising* 43, 333–343.
- Van Weelden, L., Maes, A., Schilperoord, J., and Cozijn, R. (2011). The role of shape in comparing objects: How perceptual similarity may affect visual metaphor processing. *Metaphor & Symbol* 26, 272–298.
- Vega Moreno, R. E. (2007). *Creativity and Convention: The Pragmatics of Everyday Figurative Speech*. Amsterdam: John Benjamins.
- White, R. M. (1996). *The Structure of Metaphor*. Oxford: Blackwell.
- White, R. M. (2001). Literal Meaning and 'Figurative Meaning'. *Teoria* 67, 24–59.
- Wilson, D., and Carston, R. (2006). Metaphor, relevance and the “emergent property” issue. *Mind Lang.* 21, 404–433.
- Wilson, D., and Carston, R. (2008). Metaphor and the “emergent property” problem: A relevance-theoretic Treatment. *The Baltic International Yearbook of Cognition, Logic and Communication* 3, 1–40.
- Wilson, D., and Carston, R. (2019). Pragmatics and the Challenge of non-propositional Effects. *J. Pragmatics*.