

Conceptual complexes in cognitive modeling

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The present paper goes beyond previous treatments of cognitive models, especially conceptual metaphor and metonymy, by drawing on linguistic evidence. It introduces needed refinements into previous meaning construction accounts by investigating the activity of *conceptual complexes*, i.e., combinations of cognitive models whose existence can be detected from a careful examination of the meaning effects of some linguistic expressions. This improvement endows the linguist with a more powerful set of analytical tools capable of dealing with a broader range of phenomena than previous theories. The paper first explores *metaphoric* and *metonymic complexes*, and their meaning effects. Then, it addresses the metonymic exploitation of *frame complexes* and *image-schematic complexes*. The resulting analytical apparatus proves applicable to the study of *fictive motion* and *image-schema transformations*, which have so far been addressed in Cognitive Linguistics without making explicit any relation between them or with other phenomena. We give evidence that these two phenomena can be dealt with as specific cases of metonymic domain expansion and domain reduction respectively. This means that fictive motion and image-schema transformations can be fully integrated into an encompassing account of cognitive modeling based on the activity of single or combined cognitive operations on basic or complex cognitive models.

Keywords: cognitive model, cognitive operation, fictive motion, image-schema transformation, image-schematic complex, metaphoric complex, metonymic complex

1. Introduction

Over the past three decades much of the work on Cognitive Linguistics has been focused on cognitive phenomena that directly bear upon linguistic structure and expression. Some of them have been initially investigated on experimental grounds in psychology, such as figure-ground alignment and windowing of attention. Then,

linguists have studied their activity within language thereby endowing their accounts with cognitive adequacy (e.g., Langacker, 1987, 1999; Talmy, 2000a, 2000b, 2007, 2014). In other cases, linguists formulate initial hypotheses that do not arise directly from empirical evidence, but are merely consistent with the state of the art in cognition. For example, by drawing on linguistic evidence (e.g., attested usage patterns), Lakoff and Johnson (1980, 1999) put forward *conceptual metaphor* as arising from embodied experience and as being pervasive in language and thought. In this case, linguistic evidence came first. Then, it was followed by psychological experimentation that has given support to those aspects of the theory that are testable (see Gibbs, 2011, for an overview). Other phenomena, such as conceptual metonymy (Lakoff & Johnson, 1980; Kövecses & Radden, 1998) and conceptual blending (Fauconnier & Turner, 2002), have also been postulated and investigated by drawing on linguistic evidence. In this last case, complementary psycholinguistic research is nearly non-existent (see Glebkin, 2013). This is probably a direct consequence of the difficulties inherent to designing experimental tests of figurative meaning construction (Gibbs, 2007). Without a doubt, as such evidence arises, it will provide useful feedback on theoretical postulates. In the meantime, linguistics needs to move forward and revise its own postulates. Revisions of this sort usually arise from the consideration of new linguistic data or from the realization of new organizational patterns. The result should be twofold: first, revisions should lead to finer-grained descriptions of phenomena, whenever the data so require; second, they should lead to the formulation of more elegant scientific generalizations, i.e., those capable of accounting for more data by means of a smaller set of rules and principles. In this spirit, the present paper intends to go beyond previous treatments of cognitive models, especially conceptual metaphor and metonymy, along these two lines. Thus, we will introduce needed refinements into previous accounts by investigating the activity of conceptual complexes, i.e., combinations of cognitive models whose existence can be detected from a careful examination of the meaning effects of some linguistic expressions. This improvement endows the linguist with a more powerful set of analytical tools capable of dealing with a broader range of phenomena than previous theories.

With this aim in mind, the rest of this paper is structured as follows. The second section sets the stage for the rest of the paper in the form of a brief critical overview of the basic assumptions of knowledge organization in the form of cognitive models, as originally put forward by Lakoff (1987). This section highlights the operational nature of metaphor and metonymy in contrast to frames and image schemas. The third section offers a development of the standard approach to the notion of cognitive models. This section studies the meaningful combination of cognitive models into conceptual complexes. Such combinations can happen for all cases of cognitive models, whether operational or not, and their study

endows the linguistic account with a greater ability to predict the meaning effects of linguistic expressions. The power of an approach to cognitive modeling that takes conceptual complexes into account is further evidenced, in the fourth section, by an alternative analysis of some phenomena in Cognitive Linguistics, especially Talmy's fictive motion (e.g., Talmy, 2000a, 2000b) and image-schema transformations (Lakoff, 1987; Johnson, 1987). The analysis provided here sees these two phenomena as a matter of the metonymic activation of mentally simulated conceptual representations.

2. What is a cognitive model?

The notion of *idealized cognitive model* or ICM (Lakoff, 1987) is a well-established one in Cognitive Linguistics. It is not the purpose of this section to go into a comprehensive discussion of the nature of ICMs and their types, but rather to provide the reader with the groundwork to contextualize the ensuing proposals on conceptual complexes. An ICM is an internally consistent and interrelated conceptual structure that represents how we think about the world. ICMs include Fillmore's (1985) *frames*, Johnson's (1987) *image schemas*, and Lakoff and Johnson's (1980) *conceptual metaphor* and *conceptual metonymy*.

Frames capture conceptual material representing entities and the various kinds of states of affairs (e.g., states, situations, and events). They are built by abstracting away conceptual structure from multiple experiences. Let us consider the frame of traditional Spanish bullfighting. In this frame, there is a bullfighter that fights a bull within a bullring. Other frame elements are: the entrance parade in which the participants salute the presiding dignitary, the flamboyant bullfighter's costume, the bullfighter's various moves with a red cape intended to attract the bull, the killing of the bull with a sword by the bullfighter, and the crowd's shaking of a white handkerchief to ask the president to award one of the bull's ears to the bullfighter. Of course, this is not an exhaustive description. What is important to realize is that the way we store frame elements in our mind is schematic. When we are faced with instances of frames, we adapt them to our schematic notions. For example, when we watch a bullfighter moving the red cape, we see him adopting certain bodily postures to attract the bull in an elegant way that the people attending the event generally consider a sign of bravery. A bullfighter adopting a submissive posture when moving the cape would create a counter expectation in terms of our schematization of a bullfighter's posture and movements. Making sense of this variant of the frame would require special interpretive strategies.

Image schemas are schematizations (i.e., abstractions) of spatial experience. They capture spatial orientations (e.g., *up/down* and *front/back*), space regions,

and positions (e.g., *in/out*, *on/off*, *at/away from*), part-whole structure, and forward/backward motion (along a *path*). They hold for the various topological properties of physical reality. For example, a hollow object, like a parcel, can be seen in terms of the container image schema (e.g., *He took the toy out of the parcel*). But if we focus on its sides, the surface schema is invoked (e.g., *Wrap up the parcel with brown paper*) (cf. Ruiz de Mendoza, 2017, p. 139).

Metaphor is defined as a mapping of conceptual structure from a source to a target domain. The structure and logic of the target determines the nature of the source, which needs to have elements that correspond to the target in a significant way. If cross-domain correspondences are significant, we can have metaphorical thought where one of the domains (the source) is used to reason and talk about another (the target). For example, we can talk about time as a moving object (*Time flies*), as a possession (*We don't have enough time*), as a substance (*He spent a large amount of time in the Far East*), as a surface (*be on time*), or as a bounded region in space (*in time*). These conceptual correspondences arise from experiential correlation (Grady, 1997, 1999; Lakoff & Johnson, 1999; Gibbs, 2006). The time-space connection, which arises from our perception of motion as involving the passing of time, is universal with various manifestations across languages (see Moore, 2014). Like other abstract ideas (e.g., a problem, pain, faith), time can also be treated as if it were an object or as a substance. This happens because we attribute to time an objective existence (see Rao, Mayer, & Harrington, 2001). In addition, since time is conceptualized in terms of space, we can think of our ability to control time in terms of our ability to control objects by getting onto them (i.e., onto their surfaces). This could be the motivation for our common understanding of *be on time*. For related reasons, the availability of time to perform an activity can be seen in terms of the availability of space within a bounded region. The greater the amount of space, the greater our ability to move and, by analogy, more time allows for a better chance to achieve our aims. The expression *be in time (for)* responds to this experiential grounding.

It has been noted that metaphors based on experiential correlation are to be distinguished from those exploiting (perceived) similarities between objects or between scenarios (Grady, 1999). Similarity judgments are made by focusing on specific features or on structural properties of entities. When the former is the case, metaphor may alternate with different formal variants of simile. This is the case of the metaphor *He is a fox*, for which we have two corresponding similes: *He is like a fox/as cunning as a fox*. When similarity is structural, analogy is produced. For example, the heart is to the human body as a pump is to a hydraulic system (Ruiz de Mendoza & Pérez, 2011, pp. 166–167). This allows us to call the heart a “pump” or to say that the heart “pumps” blood to all parts of the body.

Finally, metonymy, like metaphor, is defined as a conceptual mapping. But in the case of metonymy the source domain stands for the target, as in *hand* for ‘help.’ Some scholars (e.g., Kövecses & Radden, 1998; inspired by Langacker, 1993) have noted that metonymy is more than just a “stands for” connection between two related concepts. In metonymy, the source domain supplies a conceptual point of access to the target. As a consequence, the target is seen from the perspective of the source. For example, using the notion of ‘hand’ to stand for ‘help’ is primarily suggestive of manual work (e.g., *All hands on deck!*). This primary meaning can, of course, be extended to make it refer to non-manual work, but this happens through further metaphorical extension whereby intellectual work is seen in terms of physical work (e.g., *She may need a hand or two with her report*).

Lakoff (1987) thinks of metaphor and metonymy as cases of idealized cognitive models. This is so because they provide us with mental representations of our experience. Consider the following exploitation of the war metaphor: *The two companies are at war and we are in the middle*.¹ In its context, the two companies are Google and Apple, which deploy different strategies to win over each other’s territory in the field of news feeds. The author of the text is a JavaScript (or “interactive”) journalist that feels this “war” puts his work and the work of those like him at risk. It will be noted that it is nearly impossible to summarize the context of the article without resorting to the language of war. This is so because war involves opposition, strategy, and offensive and defensive action. The notion of war “models” (i.e., gives shape to) how we think about conflict in general, whether it involves the use of arms and material destruction or simply stratagem intended to deceive the adversary and cause non-material damage. In a similar way, metonymy also models thought. Metonymy is generally understood to involve a conceptual mapping where the source stands for the target. A clear example is provided by the sentence *Volkswagen has decided to stop production of the VW bus*.² Here, the car company stands for the people in charge of the production policy. But the stands-for connection has additional meaning implications. Metonymy gives conceptual prominence to the source domain over the target, while allowing for vague target domains if that is necessary. In this specific example, the focus on the company suggests that it is the whole company, rather than just some of its workers, that is responsible for the decision to discontinue one of its models. This meaning implication would be absent from a literal paraphrase: *The managers of Volkswagen have decided to stop production of the VW bus*.

1. https://medium.com/@Rich_Harris/don-t-cramp-our-style-9bcef09e638f#.6p5qtth4z (accessed on 19 September 2015).

2. <http://www.davesultimateautomotive.com/volkswagen-stops-vw-bus-production-good/> (accessed on 19 September 2015).

However, metaphor and metonymy are more than just idealized cognitive models. They act on other idealized cognitive models, such as frames and image schemas, or on the output of other metaphors and metonymies to produce differentiated meaning representations. Frames are initially created through a process of schematization of conceptual structure, i.e., we do not store one single experience, but whatever many recurring experiences have in common. Frames can be enriched by means of other related frames with which they hold conceptual connections such as instrumental, kind-of, and part-whole specifications (see work in FrameNet; e.g., Fillmore, Johnson, & Petruck, 2003; Boas, 2005). A similar situation holds for image schemas. These are schematizations of topological structure whose exact nature and properties are still being investigated (see the multiple views from linguistics, neurology, psycholinguistics, cultural studies, etc., in Hampe, 2005). One of their properties is that, like frames, image schemas can be enriched. This can be done by integrating into them frame-like constructs with an image-schematic basis, as illustrated by the sentence *The bird flew into the cave*.³ The event described in this sentence is grounded in the image-schematic notion of ‘motion-along-a-path,’ which contains a moving object, a path of motion, and a destination of motion, among other elements. In the enrichment process for the example given above, the bird is incorporated into the image schema as the object of motion, the course of motion through the air as the path, and the cave as the destination of motion. The cave is itself the materialization of another image-schematic construct, i.e., the container image schema.

Frames and frame elements can be the object of metaphorical or metonymic extension. This means that a metaphor or a metonymy can serve to identify a frame or frame element by the name of another frame or frame element. For example, on the basis of metonymy, *hand* can have a number of extended meanings: a manual laborer (e.g., *a farm hand*), a member of the crew of a ship (e.g., *a ship's hands*), a person that specializes in a given pursuit (e.g., *an old hand at negotiations*), a way of performing an activity (e.g., *a hand with children*), the cards held in a card game by a player at a certain time (e.g., *the next hand*), and a round of applause (e.g., *a big hand*). By means of metaphor *hand* can refer to the pointer on a dial or on the face of a watch (see Ruiz de Mendoza, 2017, p. 140). Image schemas can be exploited metaphorically and metonymically, but this exploitation does not serve to identify other image schemas. For example, the container image schema can be used metaphorically to talk about some emotional states (*I'm in a good/bad mood*; *She's in distress*; *He is in a rage*) or it can be exploited metonymically as in expressions where the container stands for its contents (*He drank a whole bottle*).

3. <http://www.writewithjoanrosierjones.com/blog> (accessed on 19 September 2015).

However, the use of metaphor or metonymy does not change the image schema or the frame that is based on such an image schema.

The schematization of experience and of space that is required for the creation of frames and image schemas requires the abstraction and selection of conceptual structure. This kind of cognitive activity is different from the one at work in the case of metaphor and metonymy, since these two phenomena work by putting frame elements or image schemas into correspondence. From a communicative standpoint, the result is also different: the inferences that arise from metaphor and metonymy are based on the exploitation of frames and image schemas. The latter, but not the former, have a descriptive nature, i.e., they capture selected aspects of our experience. However, the situation is not as simple as it seems at first sight. There are other cognitive processes that play a role in communication. We now turn our attention to them.

3. Conceptual complexes

Concepts can be integrated into one another. This process results in more complex conceptual structures. Conceptual integration has been the focus of attention of cognitive linguists adhering to *blending* theory, as set out in work by Fauconnier and Turner (2002). One of the areas of emphasis of blending theory is concerned with how selected conceptual structure from various “input” mental spaces is combined into a single conceptual whole, which is characterized by containing its own idiosyncratic elements, called “emergent” structure. A well-known example of how a blending-theoretic analysis works is provided by the metaphor *This surgeon is a butcher*. This metaphor can be used as a damning remark on a medical practitioner. The standard account of metaphor provided by Conceptual Metaphor Theory (CMT; Lakoff & Johnson, 1980, 1999) would postulate, among others, correspondences between a butcher and a surgeon, a dead animal and a patient, and the butcher’s cleaver and a scalpel. The source domain contains elements from the domain of butchery (slaughtering and dressing animals for food or market) and the target contains elements from the domain of medical care. Blending proponents (e.g., Grady, Oakley, & Coulson, 1999) argue that the element of “incompetence” is not present either in the source or in the target of this metaphor. They also argue that the butchery and surgery spaces contain incompatible conceptual structure in terms of a means-ends analysis. In the domain of butchery, the goal is to kill the animal, sever its flesh from its bones, and sell all this in the market as food. In the domain of surgery, the goal is to heal the patient. These two spaces, butchery and surgery, however, share some conceptual structure, which is represented in a “generic” space, where a person uses a sharp instrument to cut flesh.

Shared conceptual structure allows for the two mental spaces to be projected into the blended space. In the blended space the means of butchery are combined with the ends, the individuals, and their roles. So, in this space we have a butcher performing the role of a surgeon on a patient in the way a butcher will go about cutting the flesh of an animal. This involves incongruity between the butcher's means and the surgeon's ends, which results in the central inference that the surgeon is incompetent. Since this inference is not in the source or the target of the metaphor, it follows that it is an "emergent property" that goes beyond the explanatory ability of the standard source-target mapping account.

There are, however, alternative ways to account for this "emergent" property without abandoning CMT. For example, Ruiz de Mendoza and Díez (2002) have contended that the incompetence element arises inferentially not from giving the surgeon's role to a butcher but from thinking of a surgeon doing surgery "as if" he were a butcher cutting meat. If this is so, the means of butchery does not combine with the various elements of the surgeon's scenario, i.e., the butcher is still a butcher and does not take the surgeon's role. In support of this analysis, it is crucial to note that the idea that the surgeon is incompetent can also be conveyed by means of simile, which clearly does not conflate roles but rather the opposite. Simile has the quality, not present in metaphor, of explicitly dissociating all source and target elements except for one, which is used to set up similarities. The surgeon-butcher example can be expressed in the form of a simile: *My surgeon works like a butcher*. This simile allows us to see that the butcher is a butcher (i.e., he kills animals, cuts their meat, and sells it) and does not take the surgeon's role. It is the lack of accuracy with which the butcher cuts the meat that bears a degree of resemblance with the way in which the surgeon in the example uses his surgical tools on a patient. Since surgeons are expected to be extremely meticulous and precise, the comparison gives rise to an inference on the surgeon's incompetence, the same as in the metaphor. There is no need for an analysis in terms of the conflation of roles to account for this central meaning inference. What is more, this alternative explanation has greater generalizing power than the standard blending-theoretic account: it does not need any complementary explanatory apparatus in terms of input spaces and blending, and it covers two phenomena with one single generalization on the role of cross-domain resemblance in the production of inferences.

The possibility of giving a more powerful alternative explanation for the surgeon-butcher example, however, does not invalidate the idea that concepts can be integrated into one another. This may not happen in relation to metaphor-based inferences, but it does happen in other uses of language. The following subsections offer a brief discussion of the processes involved in conceptual integration. Each subsection deals with a different cognitive model type, viz. frames, image schemas,

metonymy, and metaphor. However, we shall keep in mind the descriptive nature of the first two versus the operational nature of the latter two.

3.1 Frame complexes

Frame complexes result from the integration of conventional or unconventional frame structure into relevant parts of a given matrix frame. Let us go back to the bullfighting frame, where a good performance is rewarded by the crowd standing as they wave white handkerchiefs towards the President's box. This is a way to petition a trophy for the bullfighter, which normally consists in one of the bull's ears, but in excellent performances it can be the two ears or even, although rarely, the bull's tail. Lesser performances may get either applause or a standing ovation. If a performance is extremely poor, the bullfighter may be booed. These are *conventional developments* of the schematic rewards slot of the bullfighting frame, which acts as a matrix frame. But we can think of unconventional ways of addressing good and bad performances. For example, we could have whistling for poor performances or a significantly short round of applause. Still, we can modify other elements of the bullfight in more imaginative ways through *unconventional developments*. Thus, it would be highly unusual, although not outlandish, to have two bullfighters fighting one bull at the same time. We could easily accommodate the extra bullfighter by reconstructing the bullfighting scenario in partial analogy with, for example, doubles tennis or with other games where one player takes on two opponents at the same time. In any event, even in the case of heavily unconventional elaborations of a frame, there is a strong tendency to respect its basic structure and logic, i.e., its internal consistency in terms of what people would normally expect about its constituting elements and the relations that hold among them. Any violation of the structure and logic of a frame will result in counter-expectations that will hinder (but not necessarily block out) communication based on it, thus calling for special interpretive strategies. For example, we would not expect the bullfighter to fight the lancers' horses rather than the bull. This elaboration would violate the procedure for bullfighting, but it could produce humorous effects based on its incongruity (see Veale, 2005).

3.2 Image-schematic complexes

Image schemas can also undergo integration processes. When two or more image schemas merge, they form what we may call *image-schematic complexes*. In previous work, based on Peña (2003, 2008), Ruiz de Mendoza (2011) has distinguished between integration by *combination* and by *enrichment*. Combination requires that the concepts to be integrated are independent of one another, while enrichment

involves the development of an image schema by means of dependent conceptual structure. Let us illustrate enrichment. The notion of 'motion' is dependent on the 'path' image schema, since motion necessarily involves a trajectory, i.e., a route or course along which an entity travels, while the notion of 'path' is in principle independent of the notion of 'motion' (e.g., *The road was built in 1914*).⁴ The two schemas, 'motion' and 'path', are simultaneously active in the sentence *The ship sailed off course*,⁵ with the notion of 'motion' enriching the notion of 'path.' There are other subsidiary image schemas, like 'diversion,' 'source,' and 'end of path.' In the same sentence the path image schema combines not only with the notion of 'motion' but also with the subsidiary 'diversion' image schema. Needless to say, the conceptual package activated by this sentence only makes partial use of the full range of possibilities provided by the image-schematic complex associated with the notion of motion. A more complete exploitation could be: *The ship sailed off its course into the rocks*. This more elaborated expression incorporates the 'container' image schema into the end-of-path slot of the 'path' image schema. Since the 'container' image schema holds an independent status with respect to the 'path' image schema, this last example illustrates integration by combination. It should be noted that in the case of image schemas, a distinction between conventional and unconventional developments is not made. This is so for one reason. Unlike frames, which can be developed into less schematic forms, image schemas remain schematic, i.e., they support, from a topological perspective, reasoning processes involving frame structure. For example, the moving entity in a motion event can be thought of in less schematic terms than motion itself (e.g., a ship, a jet airplane, a bicycle). But this does not affect our conception of motion, i.e., its basic structure and logic, which consists in a source and an end of motion, a course, speed, etc. Unconventional elaborations are possible for frames but not for their supporting spatial configurations.

3.3 Combining cognitive operations

Cognitive operations can also work together on frames or image schemas (or on combinations of them). There are several ways in which this can happen: two or more cognitive operations, of the same or of a different kind, can act, either simultaneously or in succession, on simple or complex descriptive cognitive models. For reasons of space, given the multiplicity of inferential cognitive operations, a full account of all interaction patterns is beyond the scope of the present discussion.

4. <http://www.theroute-66.com/parks.html> (accessed on 3 October 2016)

5. <http://www.popularmechanics.com/science/a12051/4263605/> (accessed on 19 September 2015)

We will address the following: metaphonymy, metonymic chains, metaphoric chains, and metaphoric amalgams.

3.3.1 *Metaphonymy*

The term *metaphonymy* originates in Goossens (1990). Goossens used it to designate cases of interaction between metaphor and metonymy. By studying a corpus of body parts, sound items, and violent action predicates, he envisaged the following scenarios (see Ruiz de Mendoza, 2014, 2017):

- i. Metaphor from metonymy. This pattern happens when a metonymy develops into a metaphor. This is the case of *beat one's breast*, which refers to the action of beating one's breast as an outward sign of sorrow. The expression only makes explicit the breast-beating element of the scenario. The rest is to be accessed metonymically. But then the expression can refer to any open show of guilt whether based on breast-beating or not. It is in this application that we metaphorically map the original scenario onto other possible scenarios where people show sorrow over their guilt.
- ii. Metonymy within metaphor. This pattern shows in the expression *bite one's tongue*, which is metaphorical for any situation where people will refrain from speaking. Since the tongue stands for one's ability to speak, there is a metonymy inside the metaphor.
- iii. Demetonymization inside a metaphor. In English *lip* is metonymic for the ability to talk, but this meaning is lost in the metaphor *pay lip service*, meaning 'pay service with the lips only,' that is, 'express support only but not put it into practice.' The metaphor does not mean 'pay service by using the ability to talk.'
- iv. Metaphor within metonymy. A metaphor can be used within a metonymy to add expressiveness to the latter. For example, the expression *be on one's hind legs* builds the metaphor PEOPLE ARE ANIMALS into the source domain of a metonymy that maps 'standing' (i.e., being on one's legs) onto 'standing up to defend one's views emphatically.'

It must be noted that scenarios (i) and (iv) are essentially the same. In both scenarios, the linguistic expression only expresses part of a situation that is to be developed metonymically before it can be mapped metaphorically onto another real-world situation with which it shares generic structure. In (i), the situation is one of breast-beating to make an open show of sorrow. In (iv), the situation contains a horse rearing on its hind legs to attack an opponent. The only difference between the two patterns is the insertion of the animal metaphor in (iv) as a way of cueing for the activation of the intended source.

As for scenario (ii), while it is true that the tongue is prominent in the action of speaking, rather than a metonymy from the tongue to the ability to speak, what we

have is a situation in which people, by biting their tongues, refrain from speaking. Again, we have a situational metonymic development of the source domain of a metaphor, which puts (ii) alongside (i) and (iv).

Finally, *pay lip service* in (iii) is not to be read as ‘pay service as if with the lips,’ but as ‘pay service (only) by speaking (and not by acting).’ The concept ‘lip,’ which generally stands for ‘speaking’ (as a case of the metonymy INSTRUMENT FOR ACTION), does not lose its metonymic character and its interaction with the metaphor *pay service* is what defines the nature of the service in the target (i.e., speaking to promise service that will not be given). In the source, the metaphor contains a payer that makes a payment to a payee. In the target, these source elements map respectively onto a person that acts to someone else’s benefit. Within this mapping context, the metonymic shift from ‘lip’ to ‘using the lips to make the promise to serve’ works on the target of the metaphor by developing the service element. This development yields a more elaborate conceptual structure in which the service rendered is only a promise of service, but not a real act.

This analysis means that the four patterns put forward by Goossens can be reduced to two: one where the source of metaphor is created through a metonymic development of an underdetermined linguistic expression; another where the actual nature of part of the target of a metaphor is pinned down metonymically. The former pattern requires expanding the amount of conceptual structure that is made explicit by the linguistic expression, while the latter requires specifying the nature of one element of structure.

Metaphonymic patterns follow a logical schema. Goossens’s examples have allowed us to identify two. We shall refer to them as *metonymic expansion of the metaphoric source domain* and *metonymic reduction of the metaphoric target domain*. In the former, metonymic expansion has the function of developing the conceptual structure directly activated by the linguistic expression into a broader conceptual representation. In the latter, metonymic reduction has the function of specifying the part of a domain that carries the interpretive burden. Other two patterns make use of the converse metonymic operations on either the source or the target domains of metaphor. These are, therefore, *metonymic reduction of the metaphoric source domain* and *metonymic expansion of the metaphoric target domain*. An example of the first of these two other patterns is supplied by paragon. A paragon is a perfect example of an outstanding quality. As argued in Ruiz de Mendoza (2017, p. 149), this figure of thought results from the interaction between metaphor and metonymy. An example is provided by the sentence *Steven Pinker is the Einstein of psycholinguistics*.⁶ Einstein, as a leading physicist, stands

6. <https://www.psychologytoday.com/blog/the-scientific-fundamentalist/201105/how-is-steven-pinker-not-michael-jordan> (accessed on 19 September 2015).

for intellectual excellence. This metonymy, which is based on domain reduction, has the effect of giving focal prominence to Einstein's intellectual excellence over other less known attributes, such as his sense of humor, his love of music, his support of civil rights, etc. Evidently, this metonymic development acts on the metaphoric source. The resulting pattern is a regular feature of paragons. Here, this conceptual pattern allows us to think of Pinker's intellectual achievements as a psycholinguist in terms of Einstein's well-known intellectual feats as a physicist. The other remaining pattern, i.e., metonymic expansion of the target of a metaphor, can be exemplified with the sentence *He knit his eyebrows*, whose source domain is extracted from domain of making clothes, where knitting requires intertwinning thread into a piece of fabric. In the target domain, we have a person that frowns. When frowning, people contract their brows in such a way that the hair on them appears to be intertwined. The question is that *He knit his eyebrows* is used to convey disapproval, concentration, or displeasure. These meaning implications are not obtained from the metaphoric source (based on the domain of knitting) but from the metaphoric target by means of metonymic elaboration. We know that frowning, which is the metonymic source, is an expression of disapproval, concentration, or displeasure, which are all possible metonymic targets.

3.3.2 Chaining metonymies

Understanding the operational value of combining metonymies into metonymic chains is important to account for the actual meaning impact of many metonymy-based linguistic expressions. For example, we use the term *the crown* to refer to the 'king' or the 'queen.' But the metonymic activity behind this act of reference is more complex than it seems at first sight. The reason why we say *the crown* rather than *the king* or *the queen* is that the crown symbolizes power. The crown stands for the power held by the person that wears it, which stands for the person himself or herself.

Let us now consider the question *Are you eating at McDonald's today?* There is little doubt that *McDonald's* in this question is metonymic for one restaurant in the chain of McDonald's hamburger fast food restaurants. But our present-day use of *McDonald's* is somehow part of the non-contextual metonymic development of McDonald's as the first restaurant bearing the family name of its founders (the McDonald brothers, Richard and Maurice) to the name of the chain later created by others and then, by means of the communicative context, to the identification of a specific restaurant in the chain:

McDonald's (first) restaurant \Rightarrow McDonald's chain of restaurants \Rightarrow any restaurant in the chain

In this series of metonymies, we start with one item in a class that stands for the whole class, which then stands for any other item belonging to it. Another example is provided by the possibility to refer to (often unidentified) government officials by mentioning the main residence and/or principal workplace of the President; e.g., the White House, in the United States, and the Kremlin, in the Russian Federation. The analysis of these uses requires two metonymic shifts: the name of the emblematic building stands for the institution located in it and the institution stands for representative people associated with it.

Let us take one final example. In *The pen is mightier than the sword*, the word *pen* is used to refer to the written word and the word *sword* to military force. However, the perspective provided by the pen and the sword makes the resulting expression more impactful. The two contrasting items are metonymic for any other item in the collection to which they belong, i.e., any writing instrument and any weapon, respectively. In turn, these instruments are metonymic for the actions of writing and fighting, which are each metonymic for their corresponding result. The sword is used to impose views and laws by force rather than by persuasion, so the central meaning implication that arises from this expression is that real power ultimately derives from persuasion by argument and reasoning and not by forceful imposition. There are four metonymic shifts involved in this meaning implication:

Pen \Rightarrow any writing instrument \Rightarrow action of writing \Rightarrow result of the action of writing (persuasion).

Sword \Rightarrow any weapon \Rightarrow action of fighting \Rightarrow result of the action of fighting (forceful imposition).

We now turn our attention to combinations of metaphors into chains.

3.3.3 Chaining metaphors

A metaphoric chain results from the combination of two or more metaphors in which the target domain of one becomes the source of another (see Ruiz de Mendoza & Galera, 2011, 2014). An easy example of metaphoric chain is provided by the English phrasal structure *break off (from)*. The verb *break* ('divide into pieces'), when combined with *off (from)*, designates the complete separation of one part from the whole: *Many branches broke off in the storm*. This same phrasal verb can have figurative uses. Let us compare *Several runners broke off from the main group*⁷ and *[...] sects broke off from the main body of the Church*.⁸ In the first exam-

7. Simplified from Google Books, *Roads less traveled: Shades of gray* (C. Dulaney, 2013) (<https://books.google.com/books?isbn=1618680455>)

8. Google Books, *Human character* (Hugh Samuel Roger Elliot, 1922, p. 88) (<https://books.google.com/books?id=NDxVAAAAMAAJ>)

ple, runners running together are seen in terms of part-whole structure, like objects. Consequently, the physical separation of some members of the group from the whole group is treated as the physical fragmentation and removal of one of the parts of the whole. In the second example, we have one further mapping where institutional detachment is treated in terms of the physical separation of people from a group. This metaphor is grounded in the fact that when people discontinue their association with an institution, they will not meet with the members of that institution any longer and they will look for other places to develop their activities. The chain takes this form (cf. Ruiz de Mendoza, 2017, p. 152):

Separation of part of an object from the whole object (source) \Leftrightarrow physical separation of part of a group of people from the whole group (target/source) \Leftrightarrow institutional (and subsequently physical) separation of a group of people from the whole group

3.3.4 *Amalgamating metaphors*

This phenomenon has been discussed in some detail in Ruiz de Mendoza and Galera (2014), where a distinction is made between *single-source* and *double-source* metaphoric amalgams. A metaphoric amalgam is essentially the result of combining two or more non-chained metaphors into a single conceptual package. Single-source amalgams are created by building the source and target of an initially self-standing (i.e., conceptually independent) metaphor into corresponding structure of another self-standing metaphor. Double-source amalgams work differently. There are two complementary source domains that map into a single target domain. In this process, each source domain supplies its own perspective on the common target. Let us explore these two interaction patterns.

A clear example of single-source metaphoric amalgam (first treated in Ruiz de Mendoza, 2008, p. 126) is found in the combination of IDEAS ARE OBJECTS and UNDERSTANDING AN IDEA IS PERCEPTUALLY EXPLORING AN OBJECT. This combination accounts for some of the inferences arising from the expression *get an idea/message across*, as illustrated in this sentence: *The professor finally got the idea across to the class*. Understanding this example requires thinking of ideas as if they were moving objects. This metaphor maps caused motion onto communication, with the addressee being the destination of motion. However, by itself, this mapping cannot account for one of the meaning effects of the example above, i.e., the implication that the addressee was finally able to understand the idea. This meaning effect arises from the second metaphor that is integrated into the first, as outlined in Table 1:

Table 1. Get an idea across

SOURCE 1	⇒	TARGET 1
Causer of motion		Communicator
Causing motion		Communicating
Moving object		Idea
Receiver of the moving object		Addressee
Receiving the moving object		Having access to the idea
SOURCE 2	⇒	TARGET 2
Perceptually exploring an object		Understanding the idea

Single-source metaphoric amalgams require a licensing factor. In *get an idea across* this factor consists in an enablement connection shared by the source and target domains: receiving a moving object provides access to it thereby allowing the receiver to inspect it; in a similar way, having mental access to an idea allows us to understand its nature.

The second pattern, double-source metaphoric amalgams, is grounded in the complementariness between two different source domains that are simultaneously mapped onto one single target domain. By way of illustration, consider the following utterance: *I think I talked some sense into your son* (Ruiz de Mendoza & Galera, 2011, p. 163). The central inference in this example is that the speaker thinks that she has managed to get the hearer's son to behave reasonably after talking with him. This inference results from thinking of the property of "sense" (i.e., good judgment) as if it were a moving object that reaches the hearer, after which the property becomes her possession. Two metaphors are combined here: (CAUSED) CHANGE IS (CAUSED) MOTION and DEVELOPING A NEW PROPERTY IS ACQUIRING AN OBJECT (see Table 2).

Table 2 spells out the central elements of the domains of caused motion and transfer of possession. The elements between square brackets, although part of the transfer of possession domain, do not hold for the amalgam, since they are overridden by the specific nature of the target domain: while in a transfer of possession the initial possessor loses possession of the object transferred, the causer of psychological change does not lose the psychological property that she causes someone else to develop (for initial discussion of notion of target-domain override, see Lakoff, 1993). By contrast, all the central elements from the 'caused motion' domain have corresponding elements in the target of 'caused change.' This suggests that the second source domain, the 'transfer of possession,' has the role of complementing the first metaphoric source, i.e., caused motion, rather than the other way

Table 2. Talk sense into someone

SOURCE 1		TARGET		SOURCE 2
Caused motion	⇒	Caused change	⇐	Transfer of possession
Causer of motion	⇒	Causer of psychological change	⇐	[Initial possessor of object]
Causing motion	⇒	Causing psychological change	⇐	[Transferring possession]
Destination of motion (seen as a container)	⇒	Psychologically affected entity	⇐	New possessor of an object
Moving object	⇒	New psychological property	⇐	Possessed object
Reaching destination	⇒	Developing psychological change	⇐	Gaining possession of an object
Manner of causing motion	⇒	Manner of causing psychological change ('slapping')	⇐	[Manner of transferring possession]

around. It is precisely because of their complementary nature that double-source metaphoric amalgams, unlike single-source amalgams, do not require any special licensing factor. The existence of two source domains results from the reasoning requirements of the target domain. In the case of 'talking sense into someone,' the target demands a complex source-domain configuration that provides analogues of two aspects of caused psychological change. One is the impact of such a change on the experiencer, which is addressed in terms of caused motion; the other is the fact that the acquired property is regarded as deeply ingrained in the individual, which is seen in terms of gaining possession of an object.

In sum, the analyses provided lend support to the fact that a fully-fledged account of inferences arising from combining cognitive models, whether their nature is operational or not, requires an in-depth study of interaction patterns. Without such a study the notion of cognitive model and related theoretical developments, such as the conceptual approaches to metaphor and metonymy, fall short of providing the right generalizations for a meaning construction account of language. Without the right generalizations, the explanatory power of an account is also smaller. The next section will further illustrate the advantages of an account along the lines proposed in the present study. The emphasis will now move from the previous focus on the interaction patterns underlying conceptual complexes to the metaphoric and metonymic exploitation of frame and image-schematic complexes. This application of the analytical tools developed in relation to the creation of conceptual complexes will allow us to bring fictive motion and image-schema transformations, which have been treated as two apparently unrelated phenomena, into line with a general account of cognitive modeling.

4. The metaphoric and metonymic exploitation of frame and image-schematic complexes

Simple frames can be exploited metaphorically and metonymically to achieve meaning effects of the kind described in Section 2. Complex frames can too, but they give rise to a broader array of meaning effects in the case of metaphor and to different acts of construal of the scenario in question.

4.1 Frame complexes, metaphor, and metonymy

We will reconsider once more the bullfighting frame and the rewards slot mentioned in Section 3.1. An evident metaphorical use of this frame will focus on the bullfighter's peculiar courage, elegant demeanor, and determination. In Spanish, we can metaphorically refer to a person as a *torero* ('bullfighter') to highlight these features in a way that is difficult to describe non-metaphorically. Thus, saying that a person is determined, courageous and elegant falls short of conveying the broad array of meaning implications of the metaphor. Now, let us suppose that we are impressed with the high quality of someone's work, so much so that he would deserve a substantial reward. In Spanish, this idea can be captured metaphorically through the following remark: *Merece las dos orejas y el rabo* ('He deserves to get the two ears and the tail'). Evidently, this remark requires the conventional elaboration of the rewards slot of the frame in just one of several possible ways. At the same time, this process involves a metonymic shift from the rewards part of the bullfighting frame to the whole frame, with a special focus on the feelings of the audience and the excellence of the bullfighter's performance. Before the specific elaboration of the rewards part required by the metaphorical expression, there is no possibility of providing access to the rest of the related elements of the frame. A different development of the frame, e.g., the absence of a reward or the booing of the bullfighter, would be indicators of a bad performance and would have drastically different meaning effects if exploited metaphorically.

This discussion leads us back to the notion of metaphonymy, more specifically to the type involving metonymic expansion of the source of a metaphor, which was briefly introduced above. Think of the breast-beating example discussed in 3.3.1. This action becomes meaningful as an open manifestation of sorrow within a more developed frame in which the person beating his breast publicly recognizes the burden of his misdeeds and expresses his regret for them. For some, this action may be considered a hypocritical attempt to win other people's favor; for others, it may be a sign of truthful acknowledgement and repentance. These and other meaning implications carry over to comparable situations where there is an open recognition of mistakes without any breast-beating action. Evidently, the adequate

development of the breast-beating frame is necessary for the sign of open sorrow to stand for the whole frame, which is in turn a pre-requisite for the metaphoric mapping to be meaningful. In other words, metaphoric meaning based on frame complexes is supported by metonymy.

4.2 Image-schematic complexes and metonymy

We will now argue that underlying two well-known notions in Cognitive Linguistics, i.e., fictive motion and image schema transformations, there are metonymic operations acting on image-schematic complexes. As is well known, Talmy (2000a, 2000b) distinguishes three types of motion conceptualization: *factive*, *fictive*, and *metaphorical*. In the first case, there is real motion (*The child ran from the house to the edge of the road*), while the second presents a non-dynamic situation as if there were motion (*The road ran from the Ohio river to Salem*). In the third, a non-physical entity is treated as a moving entity (*The thought came into my mind*). Talmy contends that fictive motion is based on perception: we say that a road “runs” because we scan space with our eyes longitudinally as we see a road. In fact, there are strong empirical reasons to support this proposal. Richardson and Matlock (2007) have provided experimental evidence that fictive motion descriptions affect eye movements by evoking mental representations of motion (see also Matlock 2004, 2010). Speakers are unaware that their fictive-motion descriptions do not express a literal fact.

Another interesting case of confusion between fact and fiction is provided by correlation metaphor, i.e., embodied metaphor based on the co-occurrence of events in our experience, which we briefly discussed above. Experiential correlation gives rise to the mixing up of notions or mental conflation. Thus, we do not realize that height is not the same as quantity when we say that prices go up or down. This happens because of our experience of seeing levels go up as substances or objects accumulate (Grady, 1999). It could be argued that what Talmy labels fictive motion is in fact a special case of embodied metaphor involving mental simulation based on perception where we conflate fiction and reality. Think of the following examples:

- (1) a. Where does this road go?
- b. The fence runs along the coastline.
- c. The gate leads into the inner court.

For Talmy, interpreting examples like these requires our brains to mentally scan an imaginary path. In (1a) the road itself is a path. In (1b), there is no real path, but our minds can easily interpret the space along the fence in terms of a path. In (1c) we need to think of an imaginary pathway connecting the outer and inner parts

of a building through the gate. The comparison of these examples reveals that the existence of an actual path, as in (1a), is not necessary for fictive motion to be possible. Rather, what is necessary is for the linguistic expression to supply sufficient descriptive elements for a scenario to be mentally built such that the topological arrangements of all its elements (whether explicit in the expression or implicitly derivable) are conceptually compatible with a mental simulation of motion along a path. This is the case of (1b) and (1c). From a different perspective, we can think of the three examples in (1) as different metonymic exploitations of an image-schematic complex consisting of objects in motion from a source to a destination along a path. When we say that a road “goes” or “runs” from one place to another, our mental simulation involves imaginary motion (including manner of motion) along a path, from a source to a destination, and a trajectory, i.e., the whole image-schematic complex. That is, the question in (1a) translates into something like ‘If I were to travel along this road all the way to the end of it, what would be the destination?’ By a similar reasoning process, the statement in (1b) is the rough equivalent of saying ‘There is a fence parallel to all (or an observable portion) of the coastline.’ Finally, (1c) could be rendered as follows: ‘By walking across the gate (from the outer court along an imaginary path), one comes to the inner court.’ All the conceptual material that these paraphrases contain, and perhaps more, is made accessible by the fictive motion expressions in (1). This is suggestive of metonymic domain expansion where an underdetermined linguistic expression supplies conceptual material that requires hearers to engage in building a broader conceptual representation based on the motion-along-a-path image schematic complex.

We need to keep in mind that linguistic form is selective and will only express a relevant part of the complex (thus giving rise to attention “windows” in Talmy’s terminology). The following possible answers to (1a) illustrate this observation:

- (2) a. The road goes from the river up to the mountain.
- b. The road goes up to the mountain.
- c. The road starts at the river.
- d. The road winds up the valley.

The question is that each of the expressions in (2) has an implicit target denoting the possibility of motion or imaginary motion, i.e., the idea that one can travel along the (winding) road from the river up to the mountain. In other words, the linguistic expression in fictive motion stands for the whole mental simulation that allows for the expression to be possible.

It must be noted that fictive motion does not involve treating a static scenario as if it were a dynamic one, nor reasoning about imaginary motion as if it were real motion. Rather, fictive motion situates simulated motion within the context of a scenario that can accommodate the motion-along-a-path image schematic

complex thereby allowing for this scenario to act as a metonymic target. Fictive motion is a metonymic strategy, not a metaphoric one. Compare correlation metaphors. For example, in *We need to reach our goals*, goals are destinations, motion forward is progress, and the people moving are the people making progress. These correspondences give rise to a reasoning system as illustrated by the following discourse expansion of the example above: *We really need to reach our goals; in order to do so, we may have to retrace our steps and decide on which way to go*. This expansion can only make sense in the context of assumptions provided by the metaphorical system: if goals are not achieved by means of a given plan (a motion strategy), it makes sense to determine which degree of progress (a previous landmark on the journey) was satisfactory and develop a new plan of action from there (take a different path).

Fictive motion comes quite close to another phenomenon, *image-schema transformations*, which was identified by Lakoff (1987) (see also Johnson, 1987, p. 26). Such transformations involve changing the way in which we envisage topological constructs. For example, we can imagine the path of a moving object and then focus on the point where it will come to rest. This is called the *path-focus to end-point focus* transformation. Or we can imagine several objects and then move away from them in our minds until they look like a single homogenous mass. This is the *multiplex to mass* transformation. There are other possibilities that involve such mental manipulations, like tracing the path that a moving object has traversed or the trajectory that it is going to traverse, superimposing one topological structure onto another, etc. Some of these transformations impinge on linguistic expression giving rise to some kinds of figurative language. For example, the sentence *She lives over the bridge* (compare *She walked over the bridge*) is figurative since the verb *live* is static and should, in principle, clash with the dynamic nature of *over* in the sentence. Sentences like this presuppose that the speaker and the hearer are both at one point of a path that leads to an “end point” at some distance along the same path. The focus of attention of the sentence is the end of the path rather than the rest of the elements of the motion-along-a-path complex. But the end of the path is seen from the speaker’s perspective, in such a way that, to reach it, the speaker would need to travel all along it. So, as the speaker focuses his or her attention on the end of path, his or her minds simulates the amount (and on occasion the type) of motion that he or she would need to reach their destination. This kind of imaginary motion is fictive motion, since the speaker is not moving, but implicitly referring to the trajectory one would have to follow to reach the end of path. One possible paraphrase of *She lives over the bridge* is ‘She lives at the end of the path that one can trace by walking over the bridge.’ As argued in Peña and Ruiz de Mendoza (2009), the relationship between the overt marker of motion trajectory (*over*) and its intended meaning (‘at the end of the path that one can trace by

walking over') is metonymic. At the same time, the intended meaning involves imaginary motion, which makes this specific image-schematic transformation a case of fictive motion. The difference between the path-end-of-path transformation and the examples of fictive motion above is that in the former the linguistic expression creates an apparent clash between a non-dynamic verbal predicate and the linguistic indicator of motion trajectory, while in the latter the linguistic expression ascribes motion properties to a non-dynamic entity. In both cases, the conceptual clash that takes place in a descriptive (i.e., literal) reading calls for a metonymic solution.

5. Conclusion

Cognitive linguists have explored a host of cognitive phenomena in their relation to language structure, function, and use. Some of these phenomena had already been identified within experimental psychology. Others are theoretical postulates arising from linguistic exploration based on the compilation of attested uses of language. In the former case, cognitive linguists have produced fine-grained accounts of the linguistic relevance of the phenomena in question. In the latter case, linguistic generalizations have been made by observing regularities in the data. Cognitive linguists strive to formulate such generalizations in ways that are fully compliant with the state of the art in cognitive sciences. However, further empirical testing is sought for and used as necessary feedback on the descriptive and explanatory adequacy of theoretical postulates. Ultimately, it is part of the linguist's task to elaborate, with the sources of evidence at hand, maximally explanatory accounts of attested linguistic phenomena. The present paper has contributed to this challenging enterprise within the domain of figurative language by developing a broad-ranging account of cognitive modeling that includes combinations of cognitive models into conceptual complexes. The resulting analytical apparatus has proved applicable to such phenomena as fictive motion and image-schema transformations, which have so far been studied in Cognitive Linguistics without making explicit any relation between them or with other phenomena. We have given evidence that these two phenomena can be respectively dealt with as specific cases of metonymic domain expansion and domain reduction. This means that fictive motion and image-schema transformations can be fully integrated into an encompassing account of cognitive modeling based on the activity of single or combined cognitive operations on basic or complex cognitive models.

Acknowledgements

The research on which this chapter is based has been financed by the Spanish Ministry of Economy and Competitiveness, grant no. FFI2013-43593-P. The author would like to express his appreciation to Dr. Alba Luzondo Oyón (Distance Education National University, Madrid) for her comments on a preliminary version of this article. Any remaining flaws are the author's own responsibility.

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Resumen

El presente artículo va más allá de los tratamientos previos sobre modelos cognitivos, especialmente metáfora conceptual y metonimia, basándose en evidencia lingüística. Introduce los refinamientos necesarios en modelos anteriores sobre construcción de significado investigando la actividad de *complejos conceptuales*, es decir, combinaciones de modelos cognitivos cuya existencia se puede detectar a partir de un examen cuidadoso de los efectos de significado de algunas expresiones lingüísticas. Esta mejora proporciona al lingüista un conjunto más poderoso de herramientas analíticas capaces de manejar una gama más amplia de fenómenos que las teorías anteriores. El artículo explora primero los *complejos metafóricos* y *metonímicos*, junto con sus efectos de significado. Luego, se ocupa de la explotación metonímica de *complejos de marcos* y *complejos de esquemas de imágenes*. Este aparato analítico resulta aplicable al estudio del *movimiento ficticio* y de las *transformaciones de esquemas de imágenes*, fenómenos que hasta ahora se han tratado en Lingüística Cognitiva sin hacer explícita ninguna relación entre ellos o con otros fenómenos. Damos evidencia de que estos dos fenómenos pueden tratarse como casos específicos de metonimia basada respectivamente en expansión de dominio y en reducción de dominio. Esto significa que las transformaciones del movimiento ficticio y del esquema de la imagen pueden integrarse completamente en una explicación amplia de la modelación cognitiva basada en la actividad de operaciones cognitivas únicas o combinadas sobre la base de modelos cognitivos básicos o complejos.

Palabras clave: complejos de esquemas de imágenes, complejo metafórico, complejo metonímico, modelo cognitivo, movimiento ficticio, operación cognitiva, transformaciones de esquemas de imágenes

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