

Development of Metaphorical Thought before Language:

The Pragmatic Construction of Metaphors in Action

### Abstract

In this article, we set out, first, a general overview of metaphor and metaphorical thought research within cognitive psychology and developmental psychology. We claim that, although research efforts broadened perspectives that considered metaphors to be ornaments of poetic language, certain predominance of a linguistic point of view within investigations led to relatively little attention paid to (i) non-verbal and non-written metaphorical instantiations, and (ii) the pre-linguistic and cultural origins of metaphorical thought. Next, we attempt to delve into, and model, the ontogenetic origins of metaphor, taking into consideration social and cultural elements. To that end, we consider the Vygotskian perspective and contemporary research from the pragmatics of the object. We propose that metaphorical thought is an emerging result of a complex web of dynamic relationships between pre-linguistic and socioculturally regulated semiotic systems. The analysis undertaken shows the need for a research programme with a developmental orientation that considers metaphor to be a product of the intertwining between the individual and social dimensions of cognitive development. We suggest this programme should find its roots in the analysis of the semiotic skills that precede the acquisition of metaphorical language.

**Keywords:** metaphor and metaphorical thought, conceptual metaphor theory, early cognitive development, conlinguistic semiotic systems, pragmatics of the object, developmental psychology.

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

Metaphor and metaphorical thought have held a privileged position within research topics approached from an interdisciplinary perspective. It is possible to trace, in both cases, long-standing and important philosophical roots—to the works of Aristotle, Bacon, Hume, Hobbes and Ricoeur, to name a few—and more contemporary contributions from the field of cognitive sciences, such as Conceptual Metaphor Theory (Lakoff, 1979/1993; Lakoff and Johnson, 1980/2003; 1999), Property Attribution Theory (Glucksberg, 2001; 2003) or Structure Mapping Theory (Gentner, 1983, 1988; Gentner and Markman, 1997; Gentner, Bowdle, Wolff and Boronat, 2001), among many others.

Although metaphor has been traditionally understood as a linguistic phenomenon and a rhetorical resource, the ground-breaking Conceptual Metaphor Theory by Lakoff and Johnson (onwards CMT) introduced the idea that “*metaphor is not a figure of speech, but a mode of thought*” (Lakoff, 1979/1993, p. 210). From this perspective, metaphor can be instantiated in other modes, different from language (for instance, images, sounds or gestures).

However, except for some works that explored the nature and cognitive role of non-linguistic and multimodal metaphors in music, images, cinema, gesture production, sign language and advertising (see, for example, Alessandroni and Martínez, 2015; Coëgnarts and Kravanja, 2012; De La Rosa Alzate, 2006; Forceville and Urios-Aparisi, 2009; Hekkert and Cila, 2015; Ingebretsen, 2013; Janzen, 2006; McNeill, 2005; 2016; Miranda and Mendes, 2015; Nilsson, 2016; Puche Navarro, 2001; 2006; Saslaw, 1996; Šorm and Steen, 2013; Spitzer, 2004; Sutton-Spence, 2016; Wilcox, 1993/2000; Yu-Kai, 2015), most of the research carried out on metaphor has been undertaken almost exclusively with a linguistic logic, focusing on verbal and written metaphorical instantiations. As Forceville noticed, “*non-verbal and multimodal metaphor have been far less extensively studied than their verbal sisters*” (2006, p. 379). This predominance of a linguistic point of view is not only evidence of a theoretical choice, but also of certain methodological restrictions particular to cognitive psychology and the analysis of pre and non-

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

linguistic aspects of cognitive experience (Alessandroni and Martínez, 2016; Gibbs and Colston, 2012).

Another interesting statement of CMT is that metaphorical thought has an experiential origin, that is, that mappings between different knowledge domains are rooted in recurrent bodily interactions with the environment. By virtue of these basic interactions, some embodied structures, called *image-schemata*, emerge in our conceptual systems. The existence of *image-schemata* is the enabling condition for metaphorical thought to occur. As Lakoff argues, “*at least some (and perhaps all) abstract reasoning is a metaphorical version of image-based reasoning*” (1990, p. 40). Undoubtedly, this point of view has interesting consequences for developmental studies and invite researchers to focus on what pre-linguistic processes precede metaphorical language. Although the importance of this claim, and while other studies have delved in the relation between metaphor learning and adult language (Gentner, 2001/2003) or proposed that mental metaphors are innate (Pinker, 1997, 2007), relatively little attention has been paid to the non-linguistic origins and the developmental trajectory of metaphorical thought.

A series of investigations carried out throughout the 20<sup>th</sup> Century by Piaget, Billow, Winner, Ortony and Vosniadou, among others—all belonging to the field of developmental psychology—, made up pioneer empirical and epistemic efforts focused on explaining the nature of some possible precursors of metaphor. These precursors include a series of linguistic behaviours in children from 18 months of age. The analysis of these behaviours paved the way for laying out theoretical coordinates and important questions on metaphor and development that, to this day, are of great interest and source of much controversy.

This article has the following aims: First, we propose to provide a general overview of Aristotle’s traditional definition of metaphor and its influence over other conceptualisations of this phenomenon. Likewise, we develop and critically test Lakoff and Johnson’s CMT (1980/2003,

1999). We have focused on this theoretical perspective for the reasons outlined *supra* (i.e., its commitment with the possibility of multimodal metaphorical instantiations and its developmental consequences). Next, we present developmental psychology's most relevant contributions on metaphor, including those of Piaget and Vosniadou (1987, 1989a, 1989b), among others.

Last, we attempt to delve into, and model, the ontogenetic origins of metaphor, taking into account social and cultural elements. To that end, we consider the Vygotskian perspective and contemporary research from the *pragmatics of the object* (Rodríguez and Moro, 1998, 1999; Rodríguez, 2006, 2012). We propose that metaphorical thought is an emerging result of a complex web of dynamic relationships between pre-linguistic and socioculturally regulated semiotic systems. The analysis undertaken shows the need for a research programme with a developmental orientation that considers metaphor to be a product of the intertwining between the individual and social dimensions of cognitive development. We suggest this programme should find its roots in the analysis of the semiotic skills that precede the acquisition of metaphorical language.

### **What Is a Metaphor?**

The definition of “metaphor” and the phenomena that make up its production and comprehension has been at the centre of the debate among an array of different disciplines, including philosophy, aesthetics, linguistics and psychology, among others. There exists a wide range of definitions of the term *metaphor*, and these depend on which dimensions of the analysis are taken into consideration and which discipline is used to frame said analysis (Tejada, 2001; Tendahl and Gibbs, 2008). Sometimes, the word *metaphor* is used to name a group of figurative language processes such as *analogy*, *translation*, *exchange*, *contradiction*, *synecdoche* and

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

*metonymy* (Miller, 1982). Other literature, on the contrary, differentiates the structure and dynamics of these processes (see, for example, Fauconnier, 1997; Lakoff and Johnson, 1980/2003, 1999; Xu and Wu, 2014).

In his third book of *De Oratore* (1942/1967, trans.), Cicero refers to metaphor as a rhetorical figure of speech and an ornament of language, whose specificity must be located in the similarities found between two words that allow an operation in which meaning is lent from one word to another. Metaphor, as long as it is used with good judgement, has the aim to bring some accession of splendour to our language and linguistically dazzle mankind.

For Aristotle, however, metaphor is the application of a word to a referent when, in fact, it belongs to another one (Aristotle, 1954/1984, trans.). It is a rhetorical figure of speech that exhibits different constructions within poetic discourse and it is located on the *level of denomination*, for which it could be stated that it is a linguistic device. According to the author, this transference of the name of one thing to another can be classified into four categories: transfer of genus to species, transfer of species to genus, transfer of species to another species, and transfer by means of analogy (Aristotle, 1954/1984, trans.).

Subsequent philosophical and linguistic contributions on the subject based their definition of metaphor in Aristotle's work, particularly that which identifies it as being in the figure of speech category. Therefore, it has become a common practice to state that metaphor is (i) a substitution of one word by another that has an apparently different meaning, (ii) a linguistic comparison, with aesthetic or rhetorical ends, between two ideas or entities that share characteristics or qualities that are identifiable, or (iii) the creation of an artificial, linguistic analogy by applying a descriptive term to an entity that is different but analogous to the entity to which that term is applicable (Feldman, 2006; Kövecses, 2010; Zanotto, Cameron and Cavalcanti, 2008).

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

Similarly, other authors proposed that metaphor should be understood as a linguistic device that allows for the formulation of implicit comparisons (i.e., without a comparative linguistic term) (Ritchie, 2013). Within this perspective, the meaning of the phrase “*Aquiles is a lion*” is equal to that of the phrase “*Aquiles is like a lion*”, and this relationship of equivalency is sufficiently clear because any speaker could understand it with no inconvenience. Simultaneously, different strains of Linguistics showed an interest in proposing an ontology of metaphor to resolve various specific theoretical complications. For example, one of the main problems of the Pragmatics of language is that of how it is possible that *what we mean to say* and *what we do say* do not always coincide (Escandell Vidal, 1996), or, more generally, what is the relationship between literal meaning and that which one intends to communicate.

Within the computational-representational paradigm of cognitive psychology, the main concern about metaphor lies in identifying which algorithmic cognitive processes are at the basis of the production and comprehension of metaphorical expressions and what is the relationship between them and the general processes of *pragmatic interpretation and semantic planning* (Ibarretxe-Antuñano and Valenzuela, 2012). This perspective proposes that a word or phrase can be classified as metaphorical if and only if it can be understood by its interpreter in the context in which it appears, but the apparent contextual meaning of the word or phrase is incongruent with its basic or common meaning (Pragglejaz Group, 2007).

Although this paper’s aim is not to expose an exhaustive revision of the available literature on the nature of *metaphor*, we can state that, traditionally, it has been alternately conceptualised as (i) a trope that operates by a relationship of similitude, (ii) a figure of speech in which there is an association of ideas of a comparative nature, or (iii) a trope or figure by which one sign is substituted by another with whom it shares at least one semantic characteristic.

## **Lakoff and Johnson's Conceptual Metaphor Theory**

### **General Overview**

CMT, proposed by Lakoff and Johnson (1980/2003; 1999) within the embodied mind cognitive programme (Seitz, 2000; Shapiro, 2014), proposes an innovative view of metaphorical thought. It states that metaphorical linguistic and written expressions are surface realisations of metaphorical projections that allow for privileged access to the comprehension of abstract areas of knowledge (*target domains*) by analogical relationships between said domains and others of a more concrete or embodied nature (*source domains*). If understood in this way, this phenomenon emerges not as an accessory to language or rhetoric but as a real tool for understanding, located on the *level of thinking*, that structurally and dynamically characterises the entire human conceptual system, and not merely poetic or discursive productions. In this sense, metaphorical thinking guides people's cognition and enables particular ways of signifying certain aspects of the world that would be impossible to signify otherwise, given they would seem to us extremely abstract because they cannot be experienced directly (see, for instance, Hellmann, Echterhoff and Thoben, 2013; Jia and Smith, 2013).

For example, while classic linguistic analysis would not consider the phrase "*The time will come when...*" as being an example of figurative language, for Lakoff and Johnson it constitutes a metaphorical expression, so long as *the time* cannot physically (i.e., literally) move in space. These authors' hypothesis lie in that, as humans, we do not have sensorial receptors associated with the passing of time, and we are therefore only able to conceptualise it using characteristics of the physical domain by means of the metaphor TIME IS MOTION. It is only through this tool we can



## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

comprehend temporality. In this way, we allot different temporal events with the ability to move in space (*time-moving* perspective, e.g. “*The exam date is getting closer*”), or we spatialize and immobilise them to move towards them (*ego-moving* perspective, e.g. “*We are approaching the end of the congress*”) (Boroditsky and Ramscar, 2002; Casasanto and Boroditsky, 2003; Richmond, Wilson and Zinken, 2012).

According to Lakoff and Johnson, there exist three main types of metaphorical organisations: orientation metaphors, ontological metaphors, and structural metaphors. These three types stem from the interactions between our bodies and the world and from the immediate understanding we have of three, natural areas of comprehension: our bodies, our interactions with the physical environment, and our intersubjective interactions with other cultural subjects. So, according to this theory, our ability to connect two domains within one metaphorical projection (for example, *temporal* and *physical* domains, such as in the earlier example) depends on each of their topological structures and the informational relationships that these structures make possible. In this way, all metaphorical projections involve the importation of certain information taken from the source domain to the target domain. This process has been referred to as *cross-domain mapping* (CDM henceforward).

Other theories about metaphorical thought have also addressed the central importance of CDM for metaphorical comprehension and reasoning about abstract subject matters. For instance, the *career of metaphor hypothesis* proposed by Bowdle and Gentner (2005) to reconcile comparison models and categorization models of metaphor comprehension states that when metaphors are

novel<sup>1</sup>, they involve extended CDM between the target and base domains. As authors say, “*a growing body of evidence suggests that even the comprehension of literal similarity comparisons such as ‘A zebra is like a horse’ involves structural alignment and inference projection*” (Bowdle and Gentner, 2005, p. 197). However, unlike Lakoff and Johnson, Bowdle and Gentner propose that, as metaphors turn conventional, a shift in mode of processing from comparison to categorization takes place: “*Beginning with a pool of novel figuratives, the Career of Metaphor hypothesis states that for some of these the base term is repeatedly used in parallel comparisons, so that a conventional abstraction becomes associated with the base*” (Zharikov and Gentner, 2002, p. 981).

Therefore, the analogical mappings connecting the source domain with the target domain become stored in the cognitive system of the speaker, and they can be “*simply re-activated by means of lexical retrieval—without implicating an on-line mapping process-*” (Gelo and Mergenthaler, 2012, p. 161). Thus, “*the ability of any of these [novel] metaphors to invoke large-scale domain interactions may reduce as they become conventionalized. This is because, unlike novel metaphors, conventional metaphors can be processed as categorizations*” (Bowdle and Gentner, 2005, p. 212). Beyond this theoretical difference, we think the career of metaphor lends valuable empirical evidence to the CMT position about the key importance of CDM for metaphorical thought.

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<sup>1</sup> The *career of metaphor hypothesis* differentiates between novel and conventional metaphors. On the one hand, *novel metaphors* are interpreted as comparisons that invite sense creation and “*involve base terms that refer to a domain-specific concept but are not (yet) associated with a domain-general category*” (Bowdle and Gentner, 2005, p. 119). Because their mode of processing involves comparison, novel metaphors can be modelled as extended structural mappings. On the other hand, *conventional metaphors* may be interpreted as comparisons or as categorisations, because they “*involve base terms that refer both to a literal concept and to an associated metaphoric category*” (Bowdle and Gentner, 2005, p. 119). During conventional metaphor comprehension we retrieve senses or meanings previously stored as abstract metaphoric categories. These conventional meanings depend on repeated comparisons of different target terms with the same base (Zharikov and Gentner, 2002). Given that conventional metaphors involve categorisation, they cannot be modelled as extended structural mappings.

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

As stated above, for the CMT, metaphorical linguistic expressions are the emergent results of cognitive processes of metaphorical projection that underlie language and that have collaborated with the creation of our conceptual systems. Therefore, it is valid to refer to metaphor (in a broad sense) as a process that permeates our thoughts, actions, and all of our linguistic expressions. For example, there exists evidence that we conceptually understand discussions as battles by means of the general metaphor ARGUMENT IS WAR (Lakoff and Johnson, 1980/2003, 1999). When we discuss something, we see and experience the person with whom we disagree as an opponent, we are interested in displaying precise strategies to beat him, we defend our position with specific resources and, when these resources are insufficient, we try to change our strategy to win the confrontation. Clearly, the battle described above is of a verbal, not physical, nature. Some linguistic expressions that prove the effects of this conceptual metaphor are: “*Your claims are indefensible*”, “*His criticisms were right on target*”, “*I demolished his argument*” and “*I’ve never won an argument with him*” (Lakoff and Johnson, 1980/2003, p. 4).

The central role CMT gives to the subject-world interaction to explain metaphorical projections has already been mentioned. This assumption places this theory within the limits of *embodied cognition*, supporting the *realist-interactionist* framework in cognitive science. This framework is in fervent opposition with *dualist-objectivist* stances that do not consider embodied aspects of the human being as being a valid source of knowledge. For CMT, it is precisely these perceptive and motor interactions between humans and their environment that make up the basis of metaphorical thought. Thus, CMT establishes a functional continuity between action and thought, principle whose direct roots can be traced to Jean Piaget’s developmental theory (1936/1981).

### **Image-schemata**

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

CDMs are possible thanks to the existence of certain schemas that allow us to construct our experience on the levels of physical and movement perceptions, understand abstract aspects of reality, confer meaning, and guide our reasoning of the world. These dynamic representations denominated *image-schemata* (Johnson, 1987/1990, 1989, 2007) emerge as a result of our recurrent kinaesthetic experience in the world. According to Johnson, an *image-schema* is a “*recurring, dynamic pattern of our perceptual interactions and motor programs that gives coherence and structure to our experience*” (Johnson, 1987/1990, p. xiv).

The *verticality* schema emerges from our tendency to use an up-down orientation in our day-to-day experience, for example when we are standing upright, climbing a tree, crouching to pick up an object, testing out the level of water in a pool, amongst other possible examples. This schema appears by a process of *conflation* and *abstraction* of experience, images and perceptions related to the *up-down* orientation.

*Image-schemata* are universal image structures that show an invariable internal organisation (they own structural elements), but are also dynamic, heuristic: their conformation is always a function of experience. As we experience the world, schemas are modified.

Understanding the theory of *image-schemata* is central to understanding how the metaphorical projections process work, made possible by CDMs’ operations. As Martínez noted:

With the objective of studying those domains that we do not experience directly, we map synesthetic image-schemata that represent ontological or meaning structures, towards other, more abstract domains. This map takes on the form of metaphorical projections that operate as agents of conceptual organisation. (Martínez, 2005, pp. 56-57, translation mine)

### **Invariance Principle**

Last, it is worth mentioning that in Lakoff and Johnson's theory, in order for a CDM to allow for the comprehension of one domain of experience in relation to another, certain ontological correspondences must exist, according to which the entities of the target domain systematically correspond to the entities of the source domain. In this way, in metaphorical projection we map out one complete metaphorical scenario on top of another. Thus, the CDM can be understood as "(...) a *fixed pattern of conceptual correspondences*" (Lakoff, 1979/1993, pp. 207-208) among metaphorical scenarios. These topological correspondences determine the success of the CDM. However:

(l)exical items that are conventional in the source domain are not always conventional in the target domain. Instead, each source domain lexical item may or may not make use of the static mapping pattern. If it does, it has an extended lexicalized sense in the target domain, where that sense is characterized by the mapping. If not, the source domain lexical item will not have a conventional sense in the target domain, but may still be actively mapped in the case of novel metaphor. (Lakoff, 1979/1993, p. 211).

These restrictions that apply to the CDM process have been theorised and grouped under a psychological principle originally proposed by Lakoff and Turner (1989) and later extensively debated (Gibbs, Costa Lima and Francozo, 2004; Lakoff, 1990; Stockwell, 1999; Tendahl and Gibbs, 2008): the *invariance principle*. This principle proposes that metaphorical mappings preserve the topological structure of the source domain. In other words, it is an appeal to the

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

unidirectional isomorphism characteristic of CDM. For example, our idea of LIFE can be structured in terms of a JOURNEY, but we do not organise our idea of a JOURNEY in terms of the idea LIFE. The cognitive topology of the source domain, JOURNEY, remains inviolable: When throughout life's course we make a decision, it cannot be undone; however, during a journey, if we take a wrong turn at a crossroads, we can turn around and choose another route. This is because, according to the *invariance principle*, “those components of the source and target domains determined to be involved in the mapping, preserve the image-schematic structure of the target, and import as much image-schematic structure from the source as is consistent with that preservation” (Turner, 1990, p. 254).

In this sense, the linguistic-conceptual meaning of a metaphorical expression will be determined by the mapping possibilities that exist between the elements pertaining to the source and target domains that preserve the topological structure of the target domain.

The considered elements of this theory about the dynamics, limitations and conditionals of the metaphorical projection process allow us to reach some preliminary conclusions with key consequences for the subject that concerns us:

- CMT allows us to account for the cognitive processes underlying the use of verbal metaphorical expressions, given that it supposes that between these two terms there exists a *systematic linking* relationship (Lakoff and Johnson, 1980/2003, p. 43). These cognitive processes, in turn, depend on certain basic embodied interactions between an individual and the environment.
- There are factors that determine the success of necessity and sufficiency relationships established between elements of the different metaphorical scenarios involved in the CMT process.

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

- These determining factors limit the reach of a conceptual metaphor favouring or discouraging the production of meaning with regards to a phenomenon that is not directly accessible by means of experience.
- Even when a metaphor is successful, it never allows for a complete representation of the phenomena located in the target domain. In words of the authors of the theory, “*the very systematicity that allows us to comprehend one aspect of a concept in terms of another (e.g., comprehending an aspect of arguing in terms of a battle) will necessarily hide other aspects of the concept*” (Lakoff and Johnson, 1980/2003, p. 10).

### **Metaphor and Ontogenesis: Contributions within Developmental Psychology**

The Conceptual Metaphor Theory outlined in the previous section re-signifies *metaphorical thought*, contributing evidence about its cognitive (and not merely linguistic) nature, and is undeniably considered as an indispensable theory within contemporary cognitive psychology. However, this perspective does not explain how metaphorical thought is constructed during ontogenesis. In this sense, we believe that this theory makes up a good cognitive description, yet does not manage to explain metaphorical phenomena. That is because it does not try to analyse the development of the processes which are the object of their study (for example, it does not question the way in which *image-schemata* are generated, nor the ontogenetic dynamics of the mappings that characterise metaphorical projections). Further, as we pointed before, the evidence supporting CMT comes, mainly, from linguistic studies. This supposes a problem when it comes to proving the developmental hypothesis that metaphorical thought is bodily based. As Casasanto notes, “*the logic by which the linguistic data support Lakoff and Johnson’s ontogenetic claim about mental metaphors is elusive*” (Casasanto, 2014, p. 252).

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

In the sections that follow, we will explore some contributions made by developmental psychology throughout the 20<sup>th</sup> Century (in particular, those by Piaget, Billow, Winner, Ortony and Vosniadou, among others) to understand the phenomena that make up the production and comprehension processes of metaphors. The aim of this overview is to show that the inquiry into metaphorical thought can be expanded further if cognitive contributions are considered in conjunction with longitudinal perspectives that concentrate on the constructive processes of metaphorical skills, and not just on *fossilised samples* (in the Vygotskian sense of the term) of adult metaphorical behaviour.

### **Metaphors in Childhood**

Within the field of developmental psychology, several authors have dedicated their research to the study of children's use of non-literal language, specifically those expressions that seem similar to the linguistic metaphor and that come into use soon after the child acquires language. In his psychogenetic studies, Jean Piaget noticed that his daughter Jacqueline, when almost three-years-old, could produce expressions with the structure "*A is like B*" (Piaget, 1951/1999). According to the author, these types of statements are based on similarities between the two objects being compared, but do not make up an example of metaphorical thought; instead, they are superficial linguistic realisations associated to *verbal and pre-conceptual schemas* that work as intermediaries between sensory-motor schemas and conceptual schemas. Piaget stated that children who are at the pre-operational stage think in pre-conceptual terms based on complex action schemas related to the subject or partly objectified and symbolic images and not in truly conceptual terms, defined as "*systems of classes, sets of objects grouped according to relations between wholes and parts, or systems of particular relations grouped according to their symmetrical or asymmetrical nature*" (Piaget, 1951/1999, p. 218).



## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

Before the age of 7, children are incapable of constructing conceptual categories like those of adults because they lack a hierarchical organisation of classes and a complete comprehension of class inclusion relationships. Given that the pragmatic effect of metaphorical expressions implies a violation of a category's conceptual reference (due to an extension of the reference or the meaning) and that children are incapable of constructing these conceptual categories, Piaget does not consider it possible that children can produce true metaphors.

In line with the Piagetian focus, other authors have stated that metaphorical thought development occurs in two, well-defined and mutually exclusive stages: a literal one and a metaphorical one. Billow (1975), for example, used an experimental study to argue that the comprehension of similarity metaphors (with the structure “*A is like B*”) and proportional metaphors (with the “*A is to B like C is to D*” structure, where A and C are attributes of the target domain and B and D attributes of the source domain) is one type of classificatory behaviour that presupposes the ability to compare the attributes shared between two items and, so, will only develop after the concrete operational stage. Cometa and Eson (1978), on the other hand, proposed that metaphorical comprehension requires the construction of an intersectional class between categories corresponding to those items that the metaphorical expression is comparing and, thus, the condition for all metaphorical thought is the possibility of developing a hierarchical order of classes and dominating its inclusion relationships. As can be seen, these *all-or-nothing* perspectives consider that, at a given moment, the child either has the ability to produce and comprehend metaphors or he doesn't.

However, and also from a linguistic perspective, other empirical investigations showed that if the domain variability implicated in metaphorical expressions are taken into consideration, the development of their comprehension could follow a different path, one not characterised by two, mutually exclusive phases, but instead by a sequence of progressive and gradual milestones. For

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

example, when a child is familiar with the entities compared within a metaphorical expression, its comprehension is made easier (Ortony, Reynolds and Arter, 1978; Wilson and Keil, 1999).

Furthermore, Piaget's view of adult concepts being well-defined classes was called into question. It was observed that many adult concepts cannot be defined in terms of objective qualities, but instead in terms of familiarities or functional attributes (Chaigneau and Barsalou, 2008; Mervis and Rosch, 1981; Rosch, 1973). Last, some argued the ability to classify could appear earlier in development than Piaget had predicted (Rosch, Mervis, Gray, Johnson and Boyes-Braem, 1976; Ross, 1980). Thus, the construction of categories, in Piagetian terms (a construction that comes late in development), does not necessarily constitute a condition of possibility for metaphorical thought.

Other contributions, which focused on ecological observation as a methodological strategy, are particularly relevant. Winner, McCarthy, Kleinman and Gardner (1979), for example, registered the moments when, in the context of a familial interaction, a 26-month-old child exclaimed "*Corn! Corn!*" while signalling a yellow plastic baseball bat and another 18-month-old child called a toy car a "*serpent*" while moving it up his mother's arm in a zigzagging motion. Moreover, Billow (1981) observed expressions similar to those aforementioned in contexts of play and in day-to-day, spontaneous contexts. He argued-against what he sustained in his 1975 article—that the production of these types of expressions are not isolated nor fortuitous, but instead respond to the existence of a child metaphorical ability, any time that expressions of the like violate the reference conventions of literal language, or involve a comparison between two objects pertaining to different domains.

Other studies with children focused on attempting to use, unsuccessfully, paraphrasing as an indicator of metaphorical comprehension (Cometa and Eson, 1978; Gardner and Winner, 1978). The impossibility exhibited by children when attempting to paraphrase certain metaphorical expressions was considered equal to a failure or absence of some of the cognitive processes subjacent to metaphorical comprehension, such as (i) understanding the literal meaning of a

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

metaphorical statement, (ii) understanding the metaphorical meaning of a metaphorical statement, (iii) understanding that, in both cases, and regarding the speaker's intentionality, it is the metaphorical meaning that should be taken into consideration, (iv) mentally representing a literal phrase that could substitute the metaphorical meaning understood and, (v) linguistically expressing the literal phrase that substitutes the metaphor, or paraphrasing it. However, the posterior empirical research did not support this position. It has been confirmed that the comprehension and paraphrasing of metaphorical expressions could comprise two, independent, cognitive processes that do not correlate and that involve different linguistic and meta-cognitive demands (Gibbs, 2001, 2008; Ortony, 1979/1993; Ortony *et al.*, 1978; Vosniadou, 1987).

Two interesting experimental studies carried out by Gentner (1988) from the *structure-mapping theory* perspective (Gentner, 1983) also delve on linguistic metaphors in childhood. They suggest that, at the age of 4, children can primarily produce and understand linguistic metaphors based on shared object attributes (i.e., *attributional metaphors*), and that at the age of 7-8, a developmental shift increases the production and comprehension of *relational metaphors* (i.e., metaphors that convey that the base and target share a common relational structure). Thus, for example, a 4-year-old would not understand that “*a tire is like a shoe*” because “*both are used to move something*” (relational interpretation), but because “*both are made of rubber*” or “*both can be black*” (attributional interpretation) (Gentner, 1983, p. 54). Only when they reach the age of 7 years children can overcome the attributive bias just exemplified. As for the developmental reasons underlying this *relational shift*, Gentner proposes three alternatives: (i) an increase in basic cognitive competence, (ii) children's learning of adult pragmatic conventions concerning what to map in metaphor, and (iii) the accretion of domain knowledge. This evidence regarding the development of metaphorical abilities is compatible with the observations made by Winner *et al.* (1979) and Billow (1981) and provides valuable information about the role of the relational structure in metaphor interpretation.

In this way, the contributions reviewed in this section stirred a debate within psychology's scientific agenda about the nature of some expressions that were apparently based on a childhood skill to perceive the similarities between objects and events in the world, and regarding whether to consider these expressions metaphorical.

### **The Literal/Metaphorical Distinction and the Context's Influence on Metaphor Comprehension**

In the next paragraphs, we briefly address Vosniadou's major contributions on metaphor production and comprehension. For Vosniadou, metaphors are cognitive resources that (i) communicate something about a concept by means of a comparison or juxtaposition between said concept and another similar one belonging to a different conventional category (Vosniadou, 1987; Vosniadou and Ortony, 1983) and, (ii) allow for new ways of representing reality, which is directly related to Lakoff and Johnson's CMT (Vosniadou, 1989a). A metaphorical sentence must be based on some perceptual similarity between juxtaposing objects, and the child must know that each object belongs to a different domain.

In contrast to Billow (1981), the author sustains that both the *renamings* and semantic extensions that occur in the context of symbolic play do not make up cases of metaphors, but instead are their precursors because, as metaphors, they depend on a childhood tendency to impose familiar schemas on objects found in the world. When involved in symbolic play, a child can omit an object's conventional name to name something else.

The author's empirical investigations show that 3-year-old children can have problems when trying to produce and comprehend metaphors that involve comparisons between abstract items that, in other words, do not share perceivable characteristics. However, if they are asked to verbally complete a statement of the "A is like..." type using one of two terms that make up a pair of

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

words, children prefer *meaningful* statements rather than anomalous ones. For example, they prefer to generate—with no distinction—expressions such as, “*A river is like a lake*” (literal statement) or, “*A river is like a snake*” (metaphorical statement) and not, “*A river is like a cat*” (anomalous statement). Thus, the hypothesis is that, around the age of three, children cannot distinguish between literal and metaphorical phrases but they can between literal/metaphorical and anomalous ones. Furthermore, it was observed that, although children base their expressions on the perceptual characteristics of the entities that take part in a metaphor, they also, occasionally, base them on the similarities between actions associated with each entity (Vosniadou and Ortony, 1983).

In contrast, by the age of 4, a new level of development in metaphorical production and comprehension is observable. The distinction between the literal and metaphorical senses arises:

By 3 years of age children see only undifferentiated similarity, distinguishing that from anomaly, while by 4 they also know that some meaningful similarity statements compare terms from the same conventional category, while other meaningful comparisons involve terms from different categories. (Vosniadou and Ortony, 1983, p. 159)

Several studies sustain that the development of metaphorical thought follows a *U-shaped* trajectory. According to Gardner and Winner (1978), up to the age of 6, children use metaphorical thought with great assiduity, a phase after which said use diminishes because children begin an educational trajectory (in schools) that focuses on the literal meaning of words and broadens their general scope of knowledge. Later, during adolescence, the use of metaphorical thought rises,

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

because these subjects already own a large base of literal meanings and can thus ignore them to think metaphorically.

Vosniadou (1987), however, proposes that what Gardner and Winner consider as *preschool metaphorical use* is not made up of metaphors but instead of precursors of metaphors, such as the *renamings* observable during symbolic play. In this way, the trajectory of metaphorical thought is always rising in line with a subject's age.

Within Vosniadou's model, the ontogeny of metaphorical competence (comprehension and production) should not be considered as comprising well-defined and mutually exclusive phases, but instead as a *continuum* that goes—gradually—from the precursors of metaphor to the crystallisation of the conceptual relationships typical of adult metaphorical thought, trajectory within which the context, in each moment of this continuum, plays a determining role regarding a subject's base of knowledge.

The author inquired into the relevance of the context regarding the comprehension of metaphors. In contrast to other perspectives that consider metaphorical comprehension to be an acontextual and eminently logical process, Vosniadou (1989b) proposes that metaphorical comprehension should be seen as an interactive process between linguistic metaphorical *inputs* and the linguistic and situational contexts where said processes occur.

The author identifies different components of the context, defined in her work as *a common platform for the speaker and the listener* (1989b). She distinguishes between an *extrinsic context*, made up of *situational* components (relative to the physical characteristics shared by the speaker and listener, such as the things they can both see and touch) and *linguistic* ones (the representational base common to the speaker and listener that was created by the linguistic interactions that occurred during previous communicational instances, for example, what was said in a conversation and what can thus be inferred from it). Moreover, Vosniadou highlights the existence of the general

knowledge and shared cultural representations that make up the *intrinsic context*. In this way, the author shows that children can use information from the context to make inferences about the meaning of metaphorical phrases, particularly in those cases wherein their knowledge base is not very broad.

### **Unresolved Problems**

In earlier sections of this paper we highlighted contributions that broadened initial considerations about metaphor-upheld by traditional linguistics and some philosophical contributions- that considered metaphors to be ornaments characteristic of poetic language. It was shown that metaphorical thought can be considered a cognitive resource and can be studied from a developmental point of view taking into consideration linguistic forms that could constitute precursors of metaphorical thought. But, although the summarised investigations presented advances on the theoretical and methodological aspects of the study of metaphorical production and comprehension, none of them delved on pre-linguistic behaviours on which adult metaphorical thought could be grounded. In the same way, these perspectives did not lend structural relevance to the connections between metaphorical thought and the sociocultural contexts that frame it. Over the last few years, a series of publications critical of CMT inquired, from a cross-cultural perspective, into how different cultural configurations impact the capacity to produce and comprehend linguistic metaphors (Aksan and Aksan, 2012; Alm-Arviu, 2012; Bernárdez, 2013; Caballero and Díaz-Vera, 2013; Eder, 2009; Ibarretxe-Antuñano, 2013; Kövecses, 2015; Kuzniak, Libura, and Szawerna, 2014). These works attempted to broaden CMT's area of influence to exceed the limits imposed by the sample upon which Lakoff and Johnson based their theory. However, these investigations do not explain how, for example, *image-schemata* or the *invariance principle* are culturally constructed.

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

Instead, they consider that metaphorical thought is a ubiquitous ability that can be affected by the independent variable *culture*.

Like Bruner (1990/2000), we endorse another way to investigate human cognition in which culture does not merely define mental processes from its place of necessary condition or independent variable. Instead, we believe processes of cultural meaning are the base upon which to think about cognitive processes and their development. This paradigm-that gathered more and more support over the last years-is known as *cultural psychology* and it is committed to the study of the bidirectional relationships between *anthropogenetic development* and cognitive processes, and the role that universal processes of cultural mediation play (Cole, 1996; Valsiner, 2000, 2012, 2014). This proposal states that *mind and culture* should not be understood as being variables of a reactive context, but instead as two inseparable terms belonging to one co-construction process wherein each partakes in the genesis and production of the other. To argue the need for a developmental and culturally oriented investigation programme, in the following section we will explore Lev. S. Vygotski's contributions about semiotic mediation, and we will present the Pragmatics of the Object's perspective as a possible theoretical framework which, we believe, could be the one which allows us to overcome the problems presented above.

### **Early Semiotic Processes and Symbolic Production**

#### **Precedents: Vygotski and Semiotic Mediation**

Perhaps one of Lev S. Vygotski's most original contributions is the formulation of a developmental theory that considers consciousness to be semiotically mediated (Rivière,



## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

1984/1985). According to the author, the development of psychological processes does not follow a continuous line but is instead composed of a series of transformational changes that go with the transition from what is called *lower mental functions* (natural) to *higher mental functions*<sup>2</sup> (eminently cultural) (Vygotski, 1934/1987). In this way, higher mental functions (those entailing the use of language) are, for this theory, subsidiary to the mediating activity of signs that function as internally oriented psychological tools, whose genesis should be understood as an internalisation process of the means of interpersonal and social communication (Langford, 2005).

For Vygotski, the precise meaning of each sign evolved over human history to play the role of a psychological tool. In this way, the affirmation that complex psychological functions are rooted in primitive semiotic processes entails accepting that all psychological functions have their roots in a cultural history that allows for interpersonal processes to become intrapersonal ones by internalisation processes (Vygotski, 1931/1966).

Moreover, all characteristically human activity is, for Vygotski, mediated by signs that allow for new and indirect ways of symbolising, describing and explaining the world. These activities also carry out self-regulatory functions (for contemporary discussions on this point, see Moro and Muller Mirza, 2014; Winsler, Fernyhough, and Montero, 2009). Although there exists a wide scientific tradition dedicated to the study of private speech and its self-regulatory function, there are few studies about pre-linguistic signs. Over recent years, however, investigations

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<sup>2</sup> In our arguments, we have decided to avoid making reference to the Vygotskian division between “*higher*” and “*lower*” psychological functions based on the well-known distinction put forth by the author between two, independent, genetic roots of thought and language. We have opted, instead, to use the concept “*complex psychological functions*.” This decision is based on the fact that, for Vygotski, in contrast to higher (superior) psychological functions, which are eminently cultural and are linked to the emergence of language, lower (inferior) psychological functions are “*natural*” forms of thought and biologically determined, which constitutes a definition that is not in line with recent advances within Early Development. As Rodriguez and Moro pointed out (1999), accepting the distinction between “*higher*” and “*lower*” psychological functions entails risking losing sight of the importance of other semiotic systems, different to language, and that partake in intersubjective communication and which are, also, culturally rooted.

concluded that there exist cognitive self-regulation processes that precede language and that involve, for example, *self-regulatory private gestures* (see following section).

In light of this brief overview of Vygotski's work, it is possible to affirm that all studies focused on complex psychological functions (i.e., metaphorical thought) should take into account, and analyse, the characteristics of the sign systems found at their basis. To that end, studies should recover the idea of mediation as a key concept that allows for a reconstructive perspective of psychological functions in their genesis processes (Ghassemzadeh, 2005). As mentioned by Vygotski, to historically study something involves studying it as it changes and to study the process of change of a psychological function entails considering, as we have foretold, "[...] *the socially organized world of culture created by the individual who developed, in the process, his latent forces and abilities*" (Yaroshevsky, 1989, p. 19).

For these reasons, we believe the study of semiotic exchanges during early childhood could provide the clues for rethinking the genesis of metaphorical thought as well as its nature. In the following section we will present an overview of the Pragmatics of the Object and analyse its exegetic value to rethink the origin and development of metaphorical thought.

### **The Pragmatics of the Object: A Study of the Cultural Genesis of Conventional Uses**

This theory, in concordance with Vygotski's work, highlights the importance of both culture and the role that interactions between children and other people can play in the origin, organisation and construction of knowledge. Thus, in this perspective thought processes cannot be undertaken without referring to the communicative interchanges that characterise humans (Rodríguez and Moro, 1999; Rodríguez, 2006). The world of meanings to which children gain access is, for this theory, a culturally constructed world that is mediated by a fundamental link, the

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

*pragmatics of the object*, the latter understood as the key that makes actions and communication possible and whose functional permanence (Rodríguez, 2012) guides our actions in the world. In other words, one of the Pragmatics of the Object key-ideas is that objects are used in our daily life to do specific things and have cultural usage rules that are public. These rules are not evident. Instead, they are appropriated by children through communicative and meaning construction processes that, in the beginning, have place within pre-linguistic semiotic systems.

The affirmation that commonplace interactions with objects are culturally constructed and, in turn, construct culture, is not only a declaration of principles, but also an invitation to consider material reality not as an inert substrate of our cognitive trajectories, but instead a fundamental part of our cognitive development. In this way, the false antinomy sustained by philosophical and psychological developments between the intersubjective and communicative social world and the world of objects is overcome, antinomy whose subsidiary is a, “*radical cognitive solipsism in which the communication between a child and the people surrounding him is nothing more than an appendix*” (Rodríguez and Moro, 1998, p. 70).

This theory presents an advance regarding earlier contributions to developmental psychology because it attempts to explain not only the use that children make of objects but also how they construct differential uses from within communicative scenarios that involve other people and cultural and public normative rules. In avoiding the importance of culture and of interactive processes, psychologists as Piaget, for example, dismissed this factor. However, this theory presents an advance not only concerning Piagetian contributions but also upon those of Lev. S. Vygotski, given that:

There exists (in Vygotski) a common denominator, the absence of semiotic mediation with regards to objects within the first phases of ontogenesis and the fact that the

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

instrumental mediation between the child and the world seems to be carried out in a direct manner. (Rodríguez and Moro, 1999, p. 33, translation mine)

Although Vygotski agrees with giving semiotic mediation a preponderant role, he does not pose the question about the object's role in the development of this mediation. From a logocentric perspective (Engeström and Sannino, 2012; Rodríguez, 2006), the author considers semiotic mediation to be exclusively tied to language. Given that language appears as the par excellence sign, pre-verbal language is relegated to a secondary plane. Only linguistic signs can allow the evolution of psychological functions from their rudimentary forms to their superior versions (Dimitrova, 2013). It should be noted that there is a certain parallelism between the limitations of this logocentric semiotic stance and that of the exclusively linguistic perspectives from which metaphorical thought was studied.

The Pragmatics of the Object, on the other hand, understands the cultural use of objects—including uses done before children start to speak—as a necessary condition for constructing thought, and understands intersubjective interactions as a condition that precedes it, in as much as, due to said interactions, groups of usage criteria are established that specify typical types of instrumental actions. The *pragmatic shift* proposed by this theory returns the object to the world, and situates it within the normative and regulatory coordinates that operate within our daily lives, analysing it in relation to its function. Thus, “[objects] are endowed with permanent uses by the community and subject to rules that differ in terms of their objectives, scenarios, technological histories in which they are rooted, activities which they permit, or possibilities of communication surrounding their uses” (Rodríguez, 2012, p. 124).

The theory summarised in this section proposes a cultural matrix with which to approach the development of the use of objects and explores the psychological birth of the *function* of

objects, that is, the way in which the *function* becomes legible to a child by the construction of an interpretative system of signs. The functional use of objects is made possible by the triadic *adult-baby-object complex interaction* that makes up, in turn, the basic unit of analysis for the study of the development. Besides, the categorisation this developmental process enables possesses a self-regulatory function because it allows the unification of the variety of the child's perceptual impressions. In fact, using an object because of its function (i.e., a cup as a *cup*) implies a qualitative leap for a child any time he stops interacting with isolated samples and starts doing so with *members of a class*.

By the end of the first year of life, and as a result of the establishment of semiotically mediated relationships, the child establishes hypotheses regarding conventional rules about objects, and it is from this place he can execute different deductions that guide his actions in the world. The conventional or canonical use appears as an *a posteriori* construction, as a consequence of the organised group of interactive cultural experiences that are triadic and reiterated and make up a meaning negotiation zone (Moro and Rodríguez, 1991). Reaching this phase is equal to stating that the object is operating, finally, as a *sign of its use* or that the object has been characterised in relation to what can be done with it in everyday life.

### **The Pragmatics of the Object, Early Development and a Proposal for Modelling Metaphorical Thought**

Why resort to a perspective such as the one proposed by the Pragmatics of the Object to analyse and model the genesis of metaphorical thought? In this section, we propose an answer to this question, paying particular attention to the reasons for which the Pragmatics of the Objects

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

emerges as an original theoretical choice for longitudinally understanding the phenomena in which we are interested, from a genuinely cultural psychological paradigm.

The basic hypothesis we uphold is that the emergence of metaphorical thought does not proceed from the *ex nihilo* appearance of a rational skill for executing abstractions and mappings between domains of knowledge or conceptual categories belonging to a transparent world. Instead, it results from a long process of construction of intersubjective meanings that multiply, juxtapose, overlap and substitute. This process occurs in the realm of action that is subjected to public and symbolically constructed rules. Metaphorical thought is, from our perspective, an emergent result of a complex web of dynamic relationships between pre-linguistic, socio-culturally regimented semiotic systems.

As a result, from our point of view, metaphorical thought appears at the centre of a *continuum* of semiotic processes that allows a child to progressively distance himself-by means of pragmatically rooted loops-from a relatively literal and observed world, to immerse himself in a more complex, creative, polysemic and eminently interpretive semiotic universe. So, we propose that the key to understanding the ontogenetic trajectory a child carries out through this continuum must be looked for in the public construction of signs, borders and semiotic filters that act as the connective tissue of, and that regulate, metaphorical understanding. If, as Gentner states, pragmatic conventions regarding shared relations could be essential for children to learn from adults what to map in metaphorical projections (1988, p. 38), the Pragmatics of the Object view becomes essential, because it addresses the construction of signs (including object uses) as an intersubjective, conventional, semiotic and pragmatic process. Unlike Gentner's point of view, we think pragmatic conventions do not appear at the age of 7-8 years, but are constructed long before language (i.e., during the first year of life).

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

To endow this hypothesis with greater clarity, in what follows, we will touch upon some of the milestones, within this semiotic continuum, that we consider being valuable when explaining the emergence of metaphorical thought. This continuum includes canonical uses (see section 5.2), the use of private and pre-linguistic gestures with self-regulatory functions and the first complex symbolic uses.

In this line, two previous works brought to light the way children use private, pre-linguistic signs as a means for self-regulating their actions in interactions with objects and instruments, which provides evidence for the existence of an original and foundational semiotic skill.

In the first of said works (Rodríguez and Palacios, 2007), a case study was carried out using a longitudinal-observational method. An audio-visual registry was taken of a girl with Down Syndrome, from the time she was 12 to 18 months old, within the context of triadic child-mother/father-toy interactions that were each 7 minutes long. Results showed that, as she approached 15 months of age, the girl could execute a conventional use of a toy only when her mother introduced said action by pointing gestures. However, by the time she was 18 months old, it became possible to see the presence of two types of self-directed signs carried out by the girl that were linked to the resolution of problems related to the conventional use of toys: private ostensive gestures and private pointing gestures. The authors' hypothesis lies in that children progressively acquire the ability to use the same signs *utilised by others* in communicative contexts with a new function, as private signs with self-regulatory functions.

In the second longitudinal-observational study (Basilio and Rodríguez, 2011), the triadic child-adult-object interaction sessions of a total of four children were registered, each of a duration of 17 to 20 minutes and conducted at 11, 13 and 15 months of age of each of said children, taken in commonplace play contexts. The researchers gave each set of parents a toy that implied the use of a hammer as an instrument for introducing balls into a box. In response to the pragmatic difficulties

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

presented by this complex object, the use of pre-linguistic signs appeared as a self-regulatory behavioural strategy: The children used private gestures to help themselves achieve the conventional use of the object. As a result of a micro-genetic analysis of the results, the researchers provided new categories for classifying pre-linguistic signs: private conventional use, private instrumental use, and private vocalisations and verbalisations. These studies advanced in describing the development of *self-referencing* skills in children that imply, in turn, an integration of different semiotic systems that can carry out self-regulatory functions.

Both studies clearly show the existing relationships between the production of private gestures and the self-regulation of behaviour as a basis for facilitating the achievement of a conventional use that presents difficulties. Thus, there exist pragmatic links between these two, different semiotic systems (uses of objects and gestures) that are socio-culturally made possible, and are intertwined.

In line with these developments, a recent empirical article written by Palacios and Rodríguez (2015) explores the construction of a child's first symbolic uses of objects, between the ages of 9 and 15 months. The notion of *symbolic use* refers to uses that represent something absent and that are based on the rules of conventional uses of objects. This original contribution is based on a group of semi-structured observations of triadic interactions whose protagonists are children of 9, 12 and 15 months of age, their parents, and familiar objects (of regular use). In contrast to that upheld by traditional points of view (like Piaget's, for example), Palacios and Rodríguez propose that, upon reaching their first year of age, children can use symbols as instruments of thought and communication to allow for an emancipation from present reality.

Through a process of systematic observation, the authors propose that children construct symbolic uses of objects in a progressive way, by means of five levels that go from the conventional use of a familiar object as a basis for a symbolic use, to a symbolic use without a material support.



## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

The first level involves the use of an object and its conventional use as the base for a symbolic use, which implies that “*the symbolic use (present) represents the conventional use (absent) of the same object outside of its habitual context or social practices*” (Palacios and Rodríguez, 2015, p. 26).

This occurs, for example, when a child plays at “*drinking water,*” using an empty cup. The second level refers to symbolic uses similar to those belonging to the first levels, and that are accompanied by vocalisations or linguistic productions. Levels three and four are qualitatively different to the previous ones in that, at these levels, a substitution of one object for another (third level) or a double substitution (fourth level) takes place. Last, the fifth level is tied to a symbolic use without a material support, for example, “*giving something*” that does not possess material instantiation, or even using, “*the own body as a signifier or representamen*” (Palacios and Rodríguez, 2015, p. 26).

The results of this investigation are relevant to our research because they revolve around the consideration of triadic interactions as being the context in which symbolic uses are constructed, the construction of meanings that operate as the base for symbolic uses of objects, and the similarity structure that underlies the symbol as a cognitive resource. These considerations could account for posterior semiotic uses such as metaphorical thought. In fact, we believe that the uses that involve symbolic replacement of one object for another, and those that lack material support (i.e., *in absentia* symbolic uses), can be considered being *metaphors in action*. Indeed, they: (i) are cognitive tools that allow for new ways of comprehending abstract domains of experience and communicating with others regarding those domains, (ii) have one of their conditions of possibility in the semiotic-pragmatic construction that precedes them ontogenetically and characterises the functional permanence of objects (conventional uses), (iii) proceed by a semiotic distancing from conventional uses (in other words, they are creative), (iv) make up systematic units of meaning, and (v) are regimented by public substitution and *in absentia* use norms.

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

If, as of Foucault's developments (1966/2014), and in line with Rodríguez, we accept that objects emerge as the result of the encounters between signs and things (Rodríguez, 2006), we can state that metaphors emerge as the result of the encounter *between signs and objects* (the latter understood as *signs of their use*), encounter that implies, by definition, the fusion of multiple public horizons of symbolic expectations. As this encounter takes place long before language (see section 5.2), we believe that studies regarding the development of metaphorical thought should discuss the pragmatic construction of metaphors in action.

Complex symbolic uses are metaphorical because they allow us to think about objects and their uses in new ways (including doing without a material substrate), creating new relationships between signifiers. They also act interchanging meanings between diverse domains of experience and building, through a creative exercise, new semiotic borders that serve as a platform for new symbolic exchange relationships that are increasingly more abstract. Furthermore, we believe that if the structural and regulatory mechanisms of metaphorical thought that Lakoff and Johnson speak of—such as *image-schemata* or the *invariance principle*—are considered sociocultural dynamic structures, it becomes essential to explain their genesis and development in semiotic terms. This task, although remains incomplete, is congruent with the perspective we have undertaken.

Up to this point, we have outlined one possible direction between three fundamental points on the semiotic continuum that takes children from their first, functional uses to some symbolic metaphorical uses and other self-regulating resources to which the child resorts to overcome eventual problems when carrying out a functional or conventional use of an object. In this way, we have laid the groundwork for the hypothesis that linguistically instantiated metaphorical thought (that, as we have showed, has been at the centre of philosophical and psychological studies) is rooted not only in the embodied interactions between an individual and his environment (understood as a physical reality), but also—and fundamentally—in the reconstructive history of

semiotic relationships that make up the world's public and normative framework. From a developmental point of view, this process also involves the culturally mediated appropriation that children carry out of these semiotic systems and their complexification as the process of ontogenesis proceeds.

### **Conclusion and Discussion**

In the preceding pages, we have dedicated ourselves to, first, showing why a perspective that analyses metaphorical thought from a purely linguistic-rhetorical perspective is insufficient and cannot account for the psychological potency that said thought entails. Contemporary discussions about the metaphorical structure of our conceptual system support this affirmation and re-signify the magnitude of Lakoff and Johnson's contributions within the field of cognitive psychology. In differentiating themselves from Aristotle or Cicero's ontological considerations on metaphor, these authors highlight the role of metaphor as a resource for understanding and not merely a decorative aspect of language.

Metaphorical linguistic expressions are, for them, superficial realisations of projections that operate on a cognitive level and that allow for privileged access to the comprehension of abstract domains of knowledge. Thus, the originality of these contributions lies in that they move metaphor out of the linguistic sphere and into the cognitive one, while maintaining for the metaphorical use of language the place of an *instantiation mode* of underlying cognitive projective processes, among other possible instantiation modes (not explored by the authors).

Although the qualitative leap made by CMT is substantial, it is necessary to point out that, in failing to sufficiently consider the longitudinal dimension, it leaves unresolved a developmental

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

problem: It does not explain how, during ontogenesis, metaphorical thought is constructed as an ability. The empirical and developmental contributions of Piaget, Billow, Winner, Ortony and Vosniadou-among others-, are indispensable to the discussion about possible precursors of metaphorical thought during childhood.

As was mentioned above, although these investigations make up an advance regarding theoretical and methodological factors of the developmental study of metaphorical competence, none of them lend any importance to pre-linguistic behaviours and to the relation between metaphorical thought and the sociocultural contexts where it is framed. These factors are central to our perspective and configure metaphor as an object of study that has not yet been exhausted.

From the perspective of cultural psychology outlined in this article, to define metaphorical thought implies, at least, classifying it as a sign system rooted in specific forms of social interactions (socially generated), as a cognitive tool and as a self-regulatory and organisational method of human mental processes. Although within the debate over metaphorical thought the last two characteristics have been addressed by Lakoff and Johnson's CMT (section 3) and in the contributions from developmental psychology mentioned above (section 4), the first of these characteristics - the developmental study of metaphorical thought - has not been sufficiently explored.

The semiotic theory of development proposed by the Pragmatics of the Object, a genuinely cultural developmental paradigm, allows us to understand this essential dimension of the problem by way of taking into consideration the relationship between different semiotic systems—of meanings constructed intersubjectively—that are a part of a continuum of which metaphorical thought makes up one end. From this perspective, we believe metaphorical thought is an emerging result of the complex web of dynamic relationships between pre-linguistic and socioculturally regulated semiotic systems that allow us to consider, for example, *in absentia* symbolic uses as

## DEVELOPMENT OF METAPHORICAL THOUGHT BEFORE LANGUAGE

being *metaphors in action*. In our view, metaphors are semiotically and pragmatically constructed in action before they appear instantiated in language.

We consider that future research on metaphorical thought should be undertaken with this perspective in mind that, as stated in previous sections, ties cognitive development to its inscription in greater cultural frameworks. This epistemological movement would allow the enrichment of Lakoff and Johnson's CMT and the advance of a developmental explanation of the phenomena explored by said theory.

As stated by Cole and Wertsch (1996), the mind should not be identified as being entirely within the head, but also in socially structured contexts. The Pragmatics of the Object introduces the novelty of including, as variables to be considered, elements of the interactive and culturally defined formats (Bruner, 1982/1984), the cultural niches (Valsiner, 2007), the elaboration of specific expectations about others' behaviour (Rochat, 1999), the socially constructed modalities of dialogical interaction and communication, and the pragmatic importance of objects.

This complex reinterpretation of the phenomenon of metaphorical thought, traditionally considered as amodal, syntactic, atemporal, eidetic and ubiquitous, drastically augments the exegetic value of the Pragmatics of the Object which emerges as a holistic model that could shed light on the nature of metaphor as a product of the intertwining between the individual and social dimensions of cognitive development. Consequently, it is relevant to consider this theoretical framework when consolidating a developmental research programme directed at studying the semiotic abilities that precede the acquisition of metaphorical thought, to reveal the processes at the basis of the emergence of, for instance, *image-schemata* and the *invariance principle* of metaphorical thought in children.

Compliance with Ethical Standards

Conflict of Interest: The author declares that he has no conflict of interest.

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