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Successes and Setbacks of Metaphors in Education

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1.1. Introduction

Is there a world “in itself”, with an absolute existence, where gaining knowledge or truth means getting closer to it? This is an age-old philosophical question. Accepting the existence of a reality external to any observer allows progress in knowledge to be measured by its proximity to this reality. Such an objectivist view runs through Western philosophy. Thus, in *Phaedrus*, Plato claims advancing in one’s understanding of the world requires following its “natural joints, rather than trying to break them up as an incompetent butcher might” (Plato 2003, p. 55). This notion of natural articulation suggests the existence of a reference standard, independent of the observer, which should not be truncated. Hobbes (1651) takes a similar position in *Leviathan* when he states that “the light of humane minds is perspicuous words, but by exact definitions first snuffed, and purged from ambiguity” (pp. 21–22). In these quotations, Hobbes’ precise definitions and Plato’s articulations hold the same status – they serve

as markers of this external reality. Within such a framework, metaphor has little credibility. At best, it is merely an approximation of a complex reality, one that oversimplifies to varying degrees. At worst, it is pure manipulation, distorting reality and presenting a situation as something other than it truly is, a flawed substitute that science could neither accept nor tolerate. According to Bachelard (2002), “a science that accepts images is, more than any other, a victim of metaphors. Consequently, the scientific mind must never cease to fight against images, against analogies, and against metaphors” (p. 47). From this perspective, and following Aristotle (1985), relying on metaphors for reasoning would be detrimental, as they fail to provide proper and comprehensible definitions:

Another rule is, see if he has used a metaphorical expression, as, for instance, if he has defined knowledge as “unsupplantable”, or the earth as a “nurse”, or temperance as a “harmony”. For a metaphorical expression is always obscure. It is possible, also, to argue sophistically against the user of a metaphorical expression as though he had used it in its literal sense: for the definition stated will not apply to the term defined. (p. 214)

Following this line of thought, metaphors may be tolerated when discussing everyday trivialities with others, but they should be excluded from reasoning, scientific pursuits and even significant endeavors such as education. Thus Rousseau (1793) wrote that he was “ashamed to use, on such a serious subject [the education of young people], those high-school figures, which everyone uses according to fancy, and which prove nothing on any side” (p. 32). This point of view is expressed again nearly two centuries later by Skinner who, while acknowledging that metaphors are “inscribed in our language”, justifies their use only in the context of “informal discussion” as opposed to “rigorous analysis”:

The educated person differs from the uneducated in almost everything he does. Three great metaphors have been devised to account for the behavior which distinguishes him. [...] All three metaphors are embedded in our language and it is perhaps impossible to

avoid them in informal discussion. Many examples will be found in the present text. Any serious analysis of the interchange between organism and environment must, however, avoid metaphor. (Skinner 1969, pp. 5–9)

Thus, these authors stress the difficulties that metaphors pose in attaining an accurate understanding of the external world, as they are seen as failing to properly represent the objects they are meant to describe. However, this is not the only criticism directed at metaphors. They are also accused of misleading not only those who use them but also those to whom they are addressed: “When they use words metaphorically; that is, in other sense than that they are ordained for; and thereby deceive others” (Hobbes 1651, p. 13). This idea is notably expressed by Locke:

[...] their fancies being struck with some lively metaphorical representations, they neglect to observe, or do not easily perceive what are the true ideas, upon which the inference depends [...] these similies so impose on them, that they serve them for certainty in themselves, and demonstration to others. (Locke 1777, pp. 427 and 443)

Thus, an objectivist philosophical stance discredits metaphor, seeing it as a distortion of reality, one that may sometimes come close to its target but never fully reaches it, or even entirely misses the mark. While appealing in its rejection of metaphorical vagueness in favor of a pursuit of accuracy and truth, this position is not without its pitfalls. The most striking of these takes the form of a paradox: even the staunchest anti-metaphorical arguments are themselves defended through metaphors.

1.2. The metaphoricity of antimetaphorics

When Tolstoy (1898) discredits metaphorical expressions in Verlaine’s poetry as meaningless – such as “seeming to live and die in a sky of copper, with no light” when speaking of the moon, or “shining like sand” when speaking of snow – he criticizes them as

being “nothing but a fabric of incorrect metaphors and words empty of meaning” (1898, p. 93). Yet, if we acknowledge that metaphors and words do not actually form a FABRIC and that words are not literally CONTAINERS filled with meaning, Tolstoy is nonetheless using metaphors to reject metaphors in these very excerpts. He is far from being an exception. On the contrary, expressing the rejection of metaphorical language through metaphors seems to be the rule – as if, when logic is cornered, its last refuge can only be metaphorical.

Thus, in the fourth century BCE, Aristotle (1985) was already comparing metaphors to common-place terms and arguing that it is the latter that ensure clarity, even though the *ornamentation* of metaphors may help to avoid banality. Consequently, when it comes to producing clear and precise definitions, metaphors should be avoided due to their inherently ambiguous nature. Much later, Hobbes provides an emblematic illustration of this idea by asserting that metaphors should be excluded from all forms of reasoning. He writes:

To conclude, the light of humane minds is perspicuous words, but by exact definitions first snuffed, and purged from ambiguity; reason is the pace; increase of science, the way; and the benefit of mankind, the end. And, on the contrary, metaphors, and senseless and ambiguous words are like *ignes fatui*; and reasoning upon them is wandering amongst innumerable absurdities; and their end, contention and sedition, or contempt. (Hobbes 1651, pp. 21–22)

In this extract, Hobbes is expressing a profound rejection of metaphors, but without dismissing them. On the contrary, the metaphorical density here is striking: the “light of humane minds”, “reason [which] is the pace”, the description of metaphors as “*ignes fatui*” (will o’ the wisps) and the assertion that using them condemns one to “wandering amongst innumerable absurdities”. In his critique of metaphors, he employs them repeatedly, seemingly unaware of the irony.

Much later, the idea that metaphors should be excluded from science was still being expressed by Bachelard (2002) in the

previously quoted passage. Yet, in his explicitly anti-metaphorical argument, the author personifies both science and the scientific mind, stating that science must not accept images lest it become a VICTIM of metaphors, and that the scientific mind must continually *fight against them*. In other words, for Bachelard, metaphors are ENEMIES OF SCIENCE, and the scientific mind is their ADVERSARY. Once again, we have here a very metaphorical antimetaphorical charge.

This skepticism – if not outright rejection – of metaphors has also surfaced within the field of educational sciences. For instance, numerous passages by Hameline (1986, 2003) emphasize the risks associated with using metaphors in this field. Yet, as with the previous quotations, his warnings are invariably steeped in metaphorical language.

Comments on education constitute a verbal colonization that is particularly rich in metaphors [...] that put users in danger of being abused. [...] Do you see our pedagogue moving words about on their root to try to stave off the abuse of which he feels victim because (the) dead metaphor of the “container” is haunting his mouth already, before he has even opened it? (Hameline 1986, p. 124)

Hameline (2003) also writes that “putting into practice the thinking on education means guarding against the machinations of the metaphorical through certain classificatory operations” (p. 114) and that “metaphors anticipate the act of definition. They parasitize it with their dormant imagery, which a rhetorical effect might opportunely awaken” (Hameline 2003, p. 115). Although Hameline follows in the footsteps of other anti-metaphorical thinkers – using, and perhaps overusing, metaphors himself – he stands out in explicitly acknowledging this paradox. He notes the impossibility of discussing metaphors without resorting to them:

Already present on the near side of and inside philosophical discourse, metaphor is there on the far side too: when the concept reaches its road’s end, again, always, the metaphor. The proof is that one can only

denounce the metaphor by metaphorical excess: “journey’s end”, “in the final analysis”, “by the way”, “at the end of the day”. Journey, assessment, position, localization: whatever peroration one uses, it is impossible to express metaphoricity other than through metaphor. The dead metaphor is given prominence in the very gesture that attempts to judge it. (Hameline 1986, p. 81)

This awareness of the difficulty, if not the impossibility, of talking about metaphors without using them echoes an excerpt from Derrida’s lecture, “The withdrawal of metaphor”:

I try to talk about metaphor, to say something specific or literal about it, to *treat* it as my topic, but I am compelled, by it, so to speak, to talk about it *more metaphorico*, in its own fashion. I cannot treat *of it* without *treating* with it, without negotiating with it to borrow from it to talk about it. I can find no way to produce a treatise on metaphor that has not been treated with metaphor which then seems intractable. (Derrida 1978, p. 105)

In short, adopting an objectivist stance – one that invites skepticism toward metaphor as inherently imprecise and therefore misleading – does not prevent one from quickly encountering its pervasive presence in discourse. Some do not acknowledge this phenomenon, while others recognize it. Yet, in either case, even the most fervent opponents of metaphor ultimately resort to it in their attempts to disqualify it. The interpretative approach to metaphor helps make sense of this paradox: it explains this form of intellectual torture that compels its critics to rely on the very thing they reject. At the same time, it provides reasons to trust metaphors.

1.3. The interpretive approach, the need to trust metaphors

The impossibility of excluding metaphor from discourse may seem paradoxical, especially for thinkers who deny its intellectual value. To explain this phenomenon, it is first important to distinguish between a

philosophical and a psychological stance regarding the role of metaphor in knowledge. This distinction matters because human beings can only understand their environment using concepts (see Chapter 2). As research in the psychology of concepts – an area that has grown significantly in recent decades – demonstrates, the notion of a human being who has direct access to an objective reality appears untenable. Since humans lack unmediated access to reality, relying instead on psychological processes such as conceptualization (Murphy 2004), the existence of an objective reality is, from a psychological perspective, purely speculative. However, this chapter does not engage with arguments for or against an objectivist philosophical stance. Instead, from an educational perspective, the focus remains on the human being – whether as the *educator* (such as a teacher), the *learner* (such as a student), or more broadly, as an individual engaged in lifelong development.

The issue running through this chapter is not that of the possibility of the existence of a reality external to the observer, but that of the prospect of psychological objectivity. For an individual, validity, truth, robustness and reliability can only be assessed within a framework structured by concepts. From an interpretative perspective, one in which the world is mentally perceived through concepts, metaphor ceases to be inherently approximate or misleading. If we accept that all situations are understood through conceptual frameworks (Murphy 2004; see Chapter 2), the question then becomes one of determining metaphor's role within the conceptual system. If concepts are metaphorically grounded, as some theories argue (see section 1.4.2.2), then metaphors are at the very core of how one perceives situations. They thus lose their status of misleading approximations and gain credit as a fertile and even essential foundation for thought. Some of the writings of Aristotle, Rousseau and Helvetius suggest that metaphors facilitate understanding and communication, particularly when the concepts at play are abstract. These ideas fully resonate with the theory of Lakoff and Johnson (1980), discussed later in this chapter. It is worth noting that some authors, Aristotle in particular, have expressed both favorable and critical views on metaphors depending on the context. This contrast

may reflect the tension between a philosophical objectivist stance and a psychological interpretative perspective.

Aristotle (1987) describes the metaphorical process – conceived as a transfer of meaning, implicitly from a source to a target – as a mark of human genius. This occurs, for example, when one speaks of the *evening of life* to refer to old age, recognizing that the relationship between evening and day mirrors the relationship between old age and life. For Aristotle, the ability to perceive connections between things enables the expansion of knowledge through metaphors:

It is metaphor, therefore, that above all produces this effect; for when Homer calls old age stubble, he teaches and informs us through the genus; for both have lost their bloom. (Aristotle 1926, p. 397)

Similarly, Rousseau, through the voices of his characters, asserts that metaphors are essential for clear expression. Thus, in *La Nouvelle Héloïse*, the character Saint-Preux defends the use of metaphors:

For as long as one has warmth in one's mind, one needs metaphors and figurative expressions to make oneself heard. Even your letters are full of them without you giving any thought to it; and I maintain that nobody, but a surveyor and a fool can speak without figures. [...] Leave them [my phrases] where I have put them, you will find them clear and even powerful. (Rousseau 1856b, p. 148 [1761])

A similar idea can also be found in *Émile ou De l'éducation*, when Rousseau (1856a [1762]) writes:

[...] I will animate the force of reasoning with images and figures; I will not be lengthy and diffuse in cold maxims, but bountiful in overflowing feelings; my reason will be grave and sententious, but my heart will never have said enough. (p. 253)

Helvetius (1758) argues that humans manage relatively easily to agree on the concrete entities of the world (e.g. a tree, a lake or a star), but not on abstract concepts (e.g. beauty, justice or truth). By allowing abstract ideas to be understood through concrete and well-defined objects, metaphors bring clarity to abstract notions and scientific principles. In another text, he also mentions that using metaphors makes discourse clearer and, consequently, more impactful:

Why do we read with so much pleasure the Authors who render their ideas with brilliant images? It is because their ideas thus become more striking, more distinct, clearer and so more apt to make a keen impression on us. Thus it is to clarity alone that all the rules of style refer. (Helvetius 1773, p. 365)

Thus, the interpretative perspective offers a way to rehabilitate the status of metaphor in relation to truth and legitimizes its use, even in conveying rigorous thought. It also explains the apparent paradox of the antimetaphorical charges that are riddled with metaphors. Indeed, since the objectivist philosophical position is expressed by human beings, they must contend with their own psychological processes – processes that depend on concepts, which in turn are grounded in metaphors. This explains why such arguments are often rich in metaphorical language. The next step is to examine the role of metaphors within the conceptual system. To do so, we will explore their status as addressed in cognitive, linguistic and psychological theories, whose findings support the interpretative perspective.

1.4. Cognitive approaches to metaphor

We will discuss this topic through two questions designed to shed light on the linguistic and psychological status of metaphors: Why do humans use metaphors? And what is the mechanism behind their interpretation? It is plainly inconceivable to offer an exhaustive answer in the few pages that follow. It is, however, possible to draw attention to some essential aspects for a linguistic analysis of metaphors and a psychological perspective on their use and role in conceptual development (see also Chapter 2). First, we will examine

the distinction between literal and non-literal language and the mechanisms involved in interpreting metaphors. These aspects will be discussed by contrasting two major schools of linguistic and psychological thought: traditional theories and more contemporary cognitive approaches, particularly those related to pragmatics and conceptual metaphors.

1.4.1. *Traditional approaches to metaphor*

Let us begin by proposing an initial distinction between literal and non-literal language. Language is used literally when words are employed with their primary meaning. For example, if we say, “Charlotte is a princess”, referring to the daughter of Prince William and Princess Catherine, we are using the word “princess” in its primary sense, that is, to talk about a person born into a royal family. Conversely, when a person intends to convey something beyond or different from this primary meaning, they are using language non-literally. For example, if, when speaking of our cat Charlotte, we say: CHARLOTTE IS A PRINCESS, we do not mean that our cat is a person born into a royal family, but we are attributing to her characteristics that are usually associated – rightly or wrongly – with a princess. This is a non-literal utterance which is, in this case, a metaphor, bearing in mind that other non-literal usages exist¹.

From a traditional perspective, rooted primarily in Aristotle’s work, there is a strict boundary between literal and non-literal language. Literal statements have literality as their only meaning, whereas non-literal statements have two meanings, their literal meaning and their non-literal meaning (Fontanier 1968 [1830]). Classical rhetoric thus assumes the existence of two levels of language: a primary, literal, level, where words have their proper meaning, and a secondary, non-literal level, where words take on a figurative meaning. Another key assumption of classical theories is that the default mode of communication is literal, whereas non-literal language is primarily reserved for literary use, particularly in poetry and literature. In this framework, rhetoric explains the purpose of

1 For example, metonymy, irony, sarcasm or other approximate usages.

non-literal language: this second level – where words acquire figurative meaning – serves either to enliven the first level or to create aesthetic pleasure through the association of ideas (Barthes 1970). This classical view has an important consequence. Indeed, postulating the existence of two levels of language and a clearly marked dividing line between literal and non-literal utterances leads to the hypothesis that these two types of utterances are not interpreted in the same way.

This hypothesis opens the possibility of distinct cognitive mechanisms for language interpretation: one dedicated to literal statements and another to non-literal ones. According to classical theories, metaphors are literally false, and recognizing this falsehood is central to understanding them. The interpretation process is thought to unfold in three stages. For example, upon hearing that our cat Charlotte “is a princess”, the listener would first derive the literal meaning of the sentence. In the second step, they would realize that this statement is false. It is precisely by recognizing its falsehood that they would move on to the next stage of interpretation, where they infer its non-literal meaning. This inferred meaning would correspond to a paraphrase of the metaphor, which, according to classical theories, often takes the form of a comparison: the speaker’s cat behaves like a princess. Thus, in the traditional perspective, metaphors are literally false but non-literally true.

However, while this classical view may seem enticing, it falls on two crucial points. The first concerns the very trigger for interpreting metaphorical statements. If metaphors were understood solely by recognizing their falsehood, then all metaphors would have to be literally false for listeners to access their meaning. Yet, this is not always the case. Consider Donne’s famous quote: “No man is an island” (Donne 2001 [1623]). This phrase is undoubtedly metaphorical, but it is not literally false (Pinto 2003). One might argue that it is not falsehood but negation that plays a central role in metaphor interpretation. However, negation does not affect whether a statement is metaphorical. For example, both *MARIE IS AN ARROW* and *MARIE IS NOT AN ARROW* are metaphors. The first suggests that Marie is quick-witted and understands things rapidly, while the second, using a negated metaphor, implies that she is slow and struggles to grasp

explanations. In other words, applying negation to a metaphorical statement does not turn it into a literal one. This suggests that neither falsehood nor negation is a determining factor in metaphor interpretation. The second flaw of traditional theories is observational. As we have noted, classical perspectives assume that the “default” mode of communication is literal language. However, everyday speech is filled with metaphors, irony and other forms of non-literal expression. As discussed earlier in this chapter, even thinkers who reject metaphor cannot avoid using it, including in their strongest anti-metaphorical claims. This suggests that figurative language is not limited to poetry or literature but is instead a common feature of everyday communication. Moreover, certain classical authors were already pointing out that there was nothing more natural and more ordinary than figures of speech and that there were more metaphors used on a market day in the marketplace than in several days of academic congress (Chesneau Du Marsais 2013 [1816]).

1.4.2. Contemporary approaches

1.4.2.1. *Relevance theory*

Several contemporary approaches in linguistics and psycholinguistics have sought to overcome the limitations of classical theories. One such approach, relevance theory, is a linguistic theory rooted in cognitive pragmatics (Sperber and Wilson 1986). This theory takes a cognitive approach to language, drawing from the pragmatic perspective developed in the work of the English philosopher Grice (1975). Its core assumption is based on the principle of linguistic economy, which states that the cognitive effort required to understand an utterance should be proportional to the cognitive effects it produces in the listener. More specifically, desirable cognitive effects are those that positively contribute to achieving an individual’s goals, such as acquiring true rather than false information, or useful rather than irrelevant information. According to this approach, the purpose of communication is to understand the communicative intent of the speaker, that is, to grasp what they mean when they use a particular utterance in a given context. To recognize the communicative intent, it is necessary to

infer a certain amount of information from the cognitive environment shared by speaker and listener. Thus, the inferential process is at the center of the relevance theory.

Prior to Grice's work, the code model, according to which each word encodes a precise concept and comprehension involves a decoding process, was the primary framework for language analysis. Relevance theory, building on Grice's insights, argues that interpreting an utterance in conversation depends on context. More specifically, context is constructed through an inferential process that draws on three main sources of information: the interlocutors' encyclopedic knowledge of the concepts used, information derived from the immediate situation and information obtained from interpreting previous utterances. These three sources are used by the listener to formulate several contextual assumptions and infer one or more implications, all contextual. These implications serve as conclusions that guide the interpretation of the utterance. Since the selection of contextual hypotheses determines the meaning of an utterance, communication failures often occur when the listener fails to identify the appropriate information.

To illustrate this phenomenon, let us take the example of a colleague who asks us the following question: "Would you like to go for a coffee?", to whom we reply, "We still have work to do". The interpretation of our response depends on the contextual assumptions adopted by our colleague, that is, on the information that will be used to infer the meaning of our response. If she makes the following set of contextual assumptions: "When you have to work, you don't want to waste time and going for a coffee takes time", she would then infer that our reply to her invitation is negative. However, if she took a different set of contextual assumptions as a starting point – for example, "While working, we may want to give ourselves a break in order to be more effective afterwards, and going for a coffee constitutes a break" – then the inferential process would, this time, point our colleague toward the interpretation that we would like to go for a coffee. Speakers can guide the contextual assumptions their listeners adopt by using specific words, thereby increasing the likelihood that the intended inferences will be drawn. For example,

“Unfortunately, we still have work to do” points toward the negative response, while “With pleasure, we still have work to do” points toward the other set of inferences. Such inferential processes are also at play when interpreting non-literal statements, including metaphors. Unlike classical theories, relevance theory does not assume distinct cognitive processes for literal and non-literal language. In other words, it posits a single interpretative mechanism based on inferences derived from contextual assumptions, regardless of the type of utterance. For instance, if a friend were to say about our cat, “Charlotte is a princess”, we would interpret this statement by retrieving from working memory the relevant inferences, such as: “Charlotte always occupies a privileged spot”, “Charlotte is always served first”, or “Charlotte has a distinguished demeanor”, which are the implications our friend intends us to understand.

The number of implications generated by a metaphorical statement varies depending on the metaphor itself. A metaphor is said to be frozen when it conveys a fixed set of implications that do not change. Conversely, the more creative a metaphor is, the more it introduces new implications that are difficult to express otherwise. A key claim of relevance theory is that thoughts expressed through metaphors are generally complex ideas that the speaker could not articulate literally due to their inherent complexity. This offers a radically different explanation from traditional approaches regarding why metaphors are used. Rather than being employed only for poetic or rhetorical effect, metaphors serve as a means to convey complex ideas in the most concise and informative way possible by leveraging shared contextual knowledge between interlocutors. While such complex thoughts can sometimes be broken down into a series of literal statements, this is often not feasible. As previously noted, even the strongest opponents of metaphorical language cannot eliminate it when arguing against its use. Indeed, constructing entirely literal statements is not only difficult but also cognitively demanding, yielding little benefit in return. In summary, individuals use metaphors because they have no other means to express, in its complexity, the message they wish to communicate.

Moreover, the mechanisms underlying metaphor comprehension can also be analyzed at a more fundamental level – the lexical level – which concerns the understanding of words themselves. How, for instance, is the word “arrow” interpreted in its non-original sense in a metaphorical statement such as *MARIE IS AN ARROW*? To answer this question, it is important to note that many words denote categories of objects or entities. In this case, the word “arrow” refers to a set of objects that have a pointed tip at one end and are fired using a bow or crossbow. According to a hypothesis proposed by Glucksberg and Keysar (1990), and further developed in the relevance theory (Sperber and Wilson 1986; Carston 2002), metaphorical understanding is based precisely on the construction of what we might call ad hoc concepts. These are abstract categories constructed on the spur of the moment (Barsalou 1983) based on the most contextually relevant properties needed to construct the metaphor’s meaning. For example, the ad hoc concept associated with the word “arrow” may be composed of the most salient properties of the concept *ARROW*: moving quickly and reaching a target rapidly. Such an ad hoc concept can naturally include human beings who share these characteristics. This explains why no one envisions Marie as an actual object with a pointed tip. Likewise, if it is said of a student that they are “an electric battery” or “fragile” or that they “have hit a wall”, or that they “are going backwards”, it is necessary to imagine ad hoc concepts of which “fragile”, “electric battery”, “hitting a wall”, “going backwards” would be prototypes containing the student in question as a member. Thus, the formation of ad hoc concepts – based on the selective extraction of certain properties – broadens their extent, allowing them to apply to different types of entities (Hofstadter and Sander 2013, Chapter 4, pp. 274–280).

Some experimental studies provide additional evidence against the traditional three-step hypothesis and support the idea of a unified interpretation process for all statements, regardless of whether they are metaphorical. If metaphors were interpreted in three steps, unlike literal statements, their comprehension should require more processing time than literal statements, which, according to traditional approaches, require only one step. However, studies have shown that metaphors do not necessarily take longer to process than literal

statements (Gibbs 1994; Glucksberg 2003). Moreover, research has also demonstrated that even when explicitly instructed, speakers are unable to ignore the metaphorical meaning of a statement (Glucksberg and McGlone 2001); see Holyoak and Stamenković (2018) for a recent review. Overall, psycholinguistic research suggests that metaphor processing is embedded within the fundamental mechanisms of language interpretation and that the use of metaphors is nearly unavoidable due to an inherent cognitive tendency to achieve maximum meaning with minimal effort (Noveck 2018, Chapter 10).

1.4.2.2. *Conceptual metaphor theory*

Another contemporary approach, less general in its scope on human cognition and more specifically focused on the psychological status of metaphors, emerged in the 1980s and remains highly influential. This theory is largely compatible with the relevance theory, particularly regarding its implications for educational perspectives. Known as the conceptual metaphor theory, it was developed by linguist George Lakoff and philosopher Mark Johnson. According to this theory, metaphors play a fundamental role in cognition because the very development and functioning of our conceptual system depend on them (Lakoff and Johnson 1980). In essence, metaphors construct, structure and shape our thoughts – our conceptual system is inherently metaphorical. As a result, in the conceptual metaphor theory, metaphors are far from being mere linguistic embellishments (Gibbs 2008).

In this approach, metaphors are described as conceptual because they are primarily tied to thought and only secondarily to language. They are used unconsciously and originate from concrete experiences that humans encounter daily as embodied beings in the world. For example, expressions, such as *getting straight to the point*, *going round in circles*, *not going all around the houses*, *running up against an obstacle*, *getting lost in the twists and turns of an argument*, are indicative of the metaphorical conception that a person has of argumentation, namely, that they regard it as an ITINERARY. This is precisely what makes metaphors inseparable from the mechanisms of conceptualization. They enable us to understand one reality in terms of another – particularly an abstract concept, such as

ARGUMENTATION, through the lens of a tangible experience, such as an ITINERARY, with all its concrete attributes, which are deeply familiar through sensory-motor experiences.

Thus, according to Lakoff and Johnson (1980), we have a sense of metaphor, in the same way that we have a sense of touch, smell or hearing. In their own words, “It is as though the ability to comprehend experience through metaphor were a sense, like seeing or touching or hearing, with metaphors providing the only ways to perceive and experience much of the world. Metaphor is as much a part of our functioning as our sense of touch, and as precious” (Lakoff and Johnson 1980, p. 239). The analogy with the senses can, indeed, be extended: just as we cannot help but feel or hear, for these are processes that largely happen in an involuntary, unplanned way, we think up metaphors and use them spontaneously and unconsciously.

Lakoff and Johnson identify two types of metaphorical structures in particular: orientation metaphors and conceptual or ontological metaphors. In this context, orientation metaphors refer to mental schema that contain axes which we employ to situate ourselves in space (*X is above/below Y*, *X is in front of/behind Y*, etc.). These mental schemas make use of simple and intuitive spatial concepts that support the possibility of representing complex concepts, such as HAPPINESS, UNHAPPINESS or TIME. This phenomenon explains the tendency to consider that happiness is high and unhappiness is low, or that the future is in front of us while the past is behind us².

This mechanism for constructing complex concepts, by using simpler, tangible concepts, is by no means limited to spatial signposting, but is also present in the functioning of metaphors that we class as conceptual. A main idea of this theory is indeed that the many concepts which are too abstract – or too ill-defined – to be apprehended directly, such as TIME, EMOTIONS or IDEAS, are understood through using other concepts that are more immediately accessible and have a connection with direct experience, such as SPATIAL ORIENTATIONS or OBJECTS. In other words, knowledge from a well-defined domain – referred to as the source

² Cultural variations are sometimes noted (Núñez and Sweetser 2006).

domain – can be used to understand a more abstract or complex domain, known as the target domain. Thus, the concept of LOVE can be understood in terms of a JOURNEY in the metaphor LOVE IS A JOURNEY. This cross-domain understanding relies on fairly systematic mapping. Concretely, the lovers could be said to be travelers, the common goals would be destinations, the relationship difficulties would be obstacles along the road, the romantic relationship would be the vehicle, etc.

Beyond aiding comprehension, this conceptual mapping also shapes our perspective on the target domain by highlighting certain aspects of the concept while concealing others (Lakoff and Johnson 1980; Thibodeau 2017). For instance, understanding love as a journey emphasizes the importance of having shared goals and the ups and downs of a relationship, much like the hills and valleys encountered during travel. However, this perspective also obscures other aspects of love. For example, the idea of passion could be stressed with the metaphor LOVE IS A FIRE; passion, like a fire, should be tended so as not to fade out. The choice of metaphors is therefore not without significance.

In everyday language, the metaphorical expressions³ we use reflect the conceptual associations a person makes between different domains of knowledge. Most often, knowledge from the material world serves as a crutch – or, put differently, as an effective explanatory shortcut – to help grasp more abstract concepts, which transcend the material world.

This process is so effective that Lakoff and Johnson have proposed seeing human cognition as fundamentally “anchored” in the direct, bodily experiences of individuals. This leads to “embodied cognition”, which shapes the construction and development of concepts and

³ Lakoff (1993, cited in Kövecses 2010) makes the distinction between a metaphor and a metaphorical expression. While the term metaphor refers to a cross-domain equivalence in the conceptual system (e.g. UNDERSTANDING IS SEEING), the term metaphorical expression refers to a linguistic expression that reflects this cross-domain equivalence at the language level (e.g. *I see what you mean, this explanation is clear, all this is very fuzzy*).

human rationality (Lakoff and Johnson 1980; Johnson 1987; Lakoff and Johnson 1999); see Pinker (1994, 2007) for a critical discussion. Thus, according to Johnson, “we humans are incarnate. Our embodiment shapes both what and how we experience, think, mean, imagine, reason, and communicate” (Johnson 2008, p. 19). The assertions of the theory of embodied cognition pose a series of fundamental questions that echo the question of psychological objectivity discussed earlier in this chapter (see section 1.3): if we take it for granted that human beings essentially think metaphorically, does that mean they are without rationality? Is their “vision of things” necessarily relativistic, leaving no more room for objective thinking and truth? What then becomes of the capacity for abstraction? Is that also inevitably “embodied”? As supported by various works in psychology (Hofstadter 1995; Sander 2000; Hofstadter and Sander 2013), rationality and objectivity, as well as abstraction, can coexist with a human mind that is fundamentally metaphorical. Thus, Sander and Hofstadter (2010) argue that “reality salutes metaphors, and will pass effective judgment on their aptness or insufficiency. They constitute not an illusory world but a set of tools for observing the world, just like microscopes” (p. 47), and they conclude that:

Thinking in metaphors is not locking oneself up in a world of fantasies to function there in a vacuum but giving oneself intellectual tools – the only ones in existence, it could even be argued – to analyze the situation, prepared to change one’s point of view if the tool proves unsuitable. Is metaphor at the heart of thinking? Yes, right at the heart. Is it irrational, anchored, subjective? Yes, no doubt, but it is also a medium and springboard of rationality, objectivity and abstraction. (Sander and Hofstadter 2010, p. 47)

1.5. Metaphorical uses by the great figures in education

Consequently, the constant, or systematic, presence of metaphors is not surprising in the field of education. It is the opposite phenomenon

that would be surprising. Research in cognitive linguistics and psycholinguistics explains this omnipresence in two ways: first, through the role metaphors play in concept formation, which is constrained by past experiences; and second, through the inferences they facilitate. The interpretative approach argues that this psychological reliance on metaphors is not necessarily detrimental. If we acknowledge its inevitability, we must also, by observing human intellectual progress, recognize a degree of fecundity.

A key contribution of the conceptual metaphor theory is its emphasis on the idea that the metaphors individuals use reveal their underlying conceptions. While the view of the metaphor as a figure of style may suggest that its use reveals the literary or pedagogical talent of the person who uses it, the conceptual metaphor theory states that metaphors are, primarily and usually unwittingly, a reflection of the profound thoughts of the person choosing them. Through the metaphors they choose, individuals inadvertently reveal their own conceptual frameworks. For example, if, commenting on an argument, it is said that a speaker in the debate was *aggressive*, but that when *under fire from critics*, they *had to capitulate* or *lay down their arms*, the choice of words, far from merely being a way of making the description more graphic, indicates that the speaker has a conception of argument that is based on the metaphor of WAR, and that the idea of debating is therefore rooted in that of confrontation. This perspective leads to a particular focus on spontaneously produced metaphors rather than explicit explanations. Instead of relying on direct questioning – which demands introspection and is prone to biases such as social desirability – it is possible to analyze the metaphors a person naturally employs in their speech to gain insight into their conceptualizations of a given domain (see Chapter 3).

From this perspective, Lakoff and Johnson (1999) sought to identify what the metaphors used by the most influential philosophers reveal about their systems of thought. They also took an interest in the way certain philosophical notions that have run through this discipline since ancient times were conceived, such as TIME, INTENTIONALITY or CAUSALITY. It emerges, for example, that the conceptual metaphor KNOWING IS SEEING occupies an essential

place in Cartesianism. Descartes (2002 [1628]) thus evokes *the natural light of reason*, indicating that ideas are illuminated by an inner light. Lakoff and Johnson support the idea that Descartes was not specifically aware of this metaphor, which they argue operates in the background, shaping other aspects of his philosophy. Their analysis suggests that if this metaphor were removed, the coherence of his reasoning would be challenged. It is, therefore, a foundational element of his philosophical system. Consider, for example, Descartes' claim that all thought is conscious. This conclusion follows from two common-sense premises: first, "everything that is seen is seen consciously", and second, "every object is visible". Here, the link with the metaphor KNOWING IS SEEING is evident, leading to the idea that thought is something the mind's "eye" can perceive. However, experimental psychology has since questioned this view. Research suggests that vision does not possess the objective clarity commonly attributed to it (Bechlivanidis and Lagnado 2013). The distinction between "believing what we see" and "seeing what we believe" is far from clear-cut. The "natural light" which Descartes speaks of has been given little legitimacy and visual perception has turned out to be a process of reconstruction, greatly influenced by the individual's prior knowledge (Sander et al. 2018). Still, while Descartes' foundational metaphor may be debatable in light of modern research, this is not necessarily the case for all metaphors. The essential idea is that metaphors are indicative of the conceptions of their authors.

In the same way, this approach can be applied to identify the conceptual metaphors underlying the positions of major figures who have shaped educational theories. Their ideas can thus be examined through the lens of the metaphors they themselves employed. For instance, the metaphor linking knowledge to vision is prominently featured in Locke's famous quote:

Knowing is seeing, and if it be so, it is madness to persuade ourselves that we do so by another man's eyes, let him use ever so many words to tell us that what he asserts is very visible. Till we ourselves see it with our own eyes, and perceive it by our own understandings, we are as much in the dark and as void of knowledge as

before, let us believe any learned author as much as we will. (Locke 1777, p. 171)

This metaphor, although shared with Descartes, takes the opposite position and supports an idea that contrasts with that of the “light of knowledge”. By extending the KNOWING IS SEEING metaphor, Locke distinguishes between seeing “by another man’s eyes” and seeing “with our own eyes”. In making this distinction, he discards the possibility of a verbal transmission of knowledge (“let him use ever so many words to tell us that what he asserts is very visible”) and argues in favor of the need for personal experience: “Till we ourselves see it with our own eyes, and perceive it by our own understandings, we are as much in the dark and as void of knowledge as before”. In other words, while the metaphor of vision may suggest that knowledge has an objective basis rooted in sensory perception, Locke repurposes it to highlight the importance of direct experience, contrasting it with a more transmissive view of learning.

The metaphor of vision is also present in Helvetius (1795) when he writes that “the truth is for fools a torch that shines through the fog without dispelling it” (pp. 123–124). In contrast to Descartes’ “natural light of reason”, Helvetius presents truth as a “torch”, a source of illumination that aids understanding (“it shines”), yet one that does not dispel all uncertainty (“the fog remains”). At a time when other leading thinkers of the “Age of Enlightenment” – the very name of which denotes the metaphor of illumination through reason – embraced the idea that knowledge could bring absolute clarity, Helvetius offered a different perspective. He argued that truth does not resolve all mysteries and that fundamental questions, like knowledge itself, remain in constant exploration. Indeed, following Locke, Helvetius stresses the role of experience in the construction of knowledge, which, he argues, cannot be the fruit of the transmission of “truths” alone.

This idea also resonates when we analyze the famous quote attributed to Maria Montessori, stating that “The child is not a vase that is filled but a stream to be allowed to gush forth”. Her double metaphor conveys the idea, on the one hand, that the mind of a student cannot be assimilated to a simple container into which are poured the (good) words of the teacher and, on the other hand, that students

already possess potentialities within themselves. The containing relationship is structuring in this quote through the metaphor of the vase and is expressed even more directly in other writings of Maria Montessori, for example, when she considers that “the child is not an empty being who owes whatever he knows to us who have filled him up with it” (Montessori 1949, p. 19), or when she rejects the idea that he is “like an empty vessel, to be filled and moulded” (Montessori 1951, p. 75). Hence, the teacher is not, primarily, a person who “instills” knowledge, but rather a revealer of predispositions.

This perspective is extensively developed in Maria Montessori’s writings, where she, unlike other major figures in education, emphasizes the importance of not interfering with what she describes as “natural” inequalities. She thus states that “there must be – there can be – only one method of education. The method which helps the natural laws of growth and of development, alike for all. [...] The only one who can dictate the method is nature itself which has established certain laws” (Montessori 1949, p. 77), or, again, that:

The child is an observer who through his senses is actively absorbing images, and this is very different from saying that he is able to receive them like a mirror. To be an observer implies an inner impulse, determined by feeling, by special tastes, leading thus to a selection of certain images rather than others. (Montessori 1951, pp. 75–76)

It is interesting to compare the quotation “The child is not a vase that is filled but a stream to be allowed to gush forth” with an older quote, sometimes attributed to Rabelais, Montaigne or other thinkers: “The student is not a vase that is filled, but a fire that is lit”. Both statements reject a transmissive conception of learning (see Chapter 3), but their metaphors suggest subtle differences in perspective. The metaphor of the lighted fire, rather than the gushing stream, seems to give more weight to the potentiality for action in the environment than to the expression of predispositions: a gushing stream exerts a localized influence on its surroundings, whereas fire can spread without limits.

The question of conceptions, conveyed through the metaphorical usage of major figures in education, raises the issue of teachers' own conceptions about teaching and learning processes. These conceptions, for example, fall more into the metaphor of ACQUISITION or of PARTICIPATION – two very widely used metaphors for learning (Sfard 1998). However, one would expect affiliation to one or the other of these metaphors to be associated with very different approaches in terms of the educational processes. The article by Sfard (1998) has much to say on this topic, beginning with its title: “On two metaphors for learning and the dangers of choosing just one”. In this article, she develops a critical discussion about two metaphors of learning that are omnipresent among students, teachers and researchers: LEARNING AS ACQUISITION and LEARNING AS PARTICIPATION (see Chapter 3). She emphasizes both the positive and the negative implications that result from the use of each of these metaphors, demonstrating the risks associated with confining oneself to specific metaphors (Beguín 1996; Rodgers 2016).

1.6. Conclusion

Does metaphor illuminate or mislead? Does it penetrate the essence of ideas or distort them into caricatures? Is it the breeding ground of thinking or a pale imitation? Is it the prerogative of the virtuoso striking the heart of the target or of the dullard garbling a reality he finds so hard to grasp that he cannot come close? Philosophy, psychology, linguistics and the educational sciences have continually oscillated between these two positions, which reflect a quasi-paradox of human thinking. The position adopted is strongly dependent on the very idea of literality. Indeed, if this idea is acceptable, it is just as acceptable to describe as approximate, or even inappropriate, anything that does not fully cover this literality.

However, since all thought relies on pre-constructed concepts, it is psychologically inconceivable to access literal truth directly without the mediation of these concepts. As a result, the feeling of perceiving reality in a direct and unbiased manner reflects a belief in the

possibility of internalizing the world with complete objectivity. In contrast, resorting to metaphor is based on making use of concepts that are sufficiently well understood to give meaning to a situation or an idea. This metaphorical illumination provides an interpretation that is a vector of inferences on the situation or idea in question.

Recent linguistic and psychological theories thus converge to give metaphor seminal status in human thinking. In doing so, they validate the intellectual fecundity of metaphors. These theories also explain why even the most ardent opponents of metaphor struggle to eliminate it from their own anti-metaphorical arguments – thus cutting the very branch they are sitting on – a contradiction similar in nature to that of heads of state advocating for restrictions on air travel at climate summits they themselves attended by plane.

Compared to the safeguards provided by adherence to the rules of logic, metaphors struggle to offer any guarantee of truth and seem subject to arbitrariness, requiring alternative criteria beyond mere logical validity. However, they also serve as powerful conduits for ideas, as they allow individuals to draw upon the vast diversity of concepts they have developed throughout their lives. Each of these concepts can potentially serve as a source of metaphor, helping to make sense of a situation that may at first seem distinct from it, but which the metaphor allows one to grasp.

Thus, the full complexity of concepts is within reach of every individual in their quest for development and can be leveraged for education. However, this accessibility comes at a cost. The question of whether a given metaphor effectively enhances understanding and fosters knowledge is a constant concern. In the effort to develop educational theories and practices that integrate metaphor, the challenge lies in constructing an epistemology that meets the high demands imposed by an unlimited range of possibilities. To counteract the potential arbitrariness of choosing one metaphor over another, a systematic methodology is needed – one that evaluates whether a metaphor is generative or, conversely, detrimental to understanding. Since metaphors reveal conceptual frameworks, the key issue is not whether they should be used, but rather how their contributions should be assessed.

1.7. References

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