Image and Metaphor in the New Century

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1. Introduction

A particular kind of early active engagement with metaphors happens when children enact them through their actions, in a process where the relevant substitution occurs primarily through gestures.[1] In this sense, enacting metaphors may well mean acting them out through an embodied process,[2] an argument supported by Lakoff and Johnson's idea that metaphor can be instantiated through nonlinguistic modalities such as gestures and images, if we consider metaphors to be primarily not a figure of speech, but a way of thought.[3] According to Conceptual Metaphor Theory (CMT), the roots of metaphorical thoughts lie in the broad bodily interactions with the environments experienced: such interactions contribute to creating those embodied structures, also referred to as image-schemata, which enable metaphorical thought processes and, at least in part, abstract reasoning.[4] By leveraging this very epistemological basis, we can reinterpret one of the earliest informal learning contexts experienced by children:

[1] Ellen Winner, Margaret McCarthy, Sandra Kleinman and Howard Gardner, "First metaphors", *New Directions for Child and Adolescent Development*, 1979/3, pp. 29–41.

[2] Shaun Gallagher and Robb Lindgren, "Enactive Metaphors: Learning through Full-body Engagement", *Educational Psychology Review,* vol. 27, no. 3 (2015), pp. 391–404.

[3] George Lakoff, "The Neural Theory of Metaphor", in Raymond Gibbs (ed.), *The Cambridge Handbook of Metaphor and Thought* (Cambridge Handbooks in Psychology), Cambridge: Cambridge University Press, 2008.

[4] George Lakoff, "The Invariance Hypothesis: Is Abstract Reason Based on Image-Schemas?" *Cognitive Linguistics*, vol. 1, no. 1 (1990), pp. 39–74.

pretend play. Traditionally defined as symbolic play, it has been outlined as a form of playful behaviour that involves nonliteral action, meaning that the acts directed towards the object do not have a real effect on it.[5] Recent scientific research supports the idea that the concept of enactive metaphor can provide a better understanding of pretend play.[6] In particular, building on the premise that seeing an object as something else requires a decentering process, a shift of perspectives in representational terms,[7] we can reconsider symbolic play as an enactive process based on the capacity to perceive different affordances in objects. Such a hypothesis is consistent with the enactive account of social cognition carried out through an extension of the sense-making concept to the social domain.[8] By referring to constructionists theory of narrative as a meaning-making act deeply related to cognitive processes and their development,[9] we shall highlight how through digital storytelling activities carried out in several Reggio Emilia Preschools' ateliers[10], children aged 3 to 6 years old have been provided with an ideal context in which to find new af-

[5] Deena Skolnick Weisberg, "Pretend Play", *Wiley Interdisciplinary Reviews*: *Cognitive Science,* vol. 6, no. 3 (2015), pp. 249–261.

[6] Zuzanna Rucinska, "Basic Pretending as Sensorimotor Engagement?", in John Mark Bishop, Andrew Owen Martin (eds.), *Contemporary Sensorimotor Theory*, Cham: Springer, 2014.

[7] Gregory Currie, *Arts and Minds*, Oxford: Oxford University Press, 2004.

[8] Hanne De Jaegher and Ezequiel Di Paolo, "Participatory Sense-making", *Phenomenology and the Cognitive Sciences,* vol. 6, no. 4 (2007), pp. 485–507.

[9] Jerome Bruner, "The Narrative Construction of Reality", *Critical Inquiry*, vol. 18, no. 1 (1991), pp. 1–21.

[10] In Reggio Emilia Preschools, each school building provides an Atelier, a space dedicated to aesthetic exploration and expressive languages. Ateliers are coordinated by the Atelieristas, professionals whose background is often in the visual arts. They work alongside teachers as to "support and develop children's and adults' visual languages as part of the complex process of knowledge building". (Vea Vecchi, *Art and Creativity in Reggio Emilia: Exploring the Role and Potential of Ateliers in Early Childhood Education*, Routledge, 2010. The quoted passage on page xiii.)

fordances and metaphorize everyday unstructured objects by actively exploring and including them within a visual narrative structure.

2. Metaphors, Enactivism and Social Cognition

Within the enactive theoretical framework, cognition is theorized as an embodied action.[11] Therefore, experience is firstly considered to be intertwined with enacting processes of meaning making, and at second instance to play a central role in all cognitive processes. A participatory sense-making process can therefore be defined as the coordination of intentional interactive activities where new domains of social sense-making are generated.[12] By referring both to this framework and to the sensorimotor theory of perception (SMTP), a paradigm based on the idea that perception is intimately linked with action,[13] it is possible to achieve a better understanding of symbolic play by reinterpreting it along more enactive lines, defining it therefore as the children's capacity to point out new affordances. Furthermore, we consider a decentering process – that is, the capacity to view the world from a different perspective – to be necessary in order to make possible a primary "as-if" response to the environment, the basis of any symbolic play activity.[14] The notion of perceptual capacity, or the ability to detect new affordances, fosters the understanding of symbolic play as an activity directed at things that are not

[11] Daniel Hutto, Michael Kirchhoff and Dor Abrahamson, "The Enactive Roots of STEM: Rethinking Educational Design in Mathematics", *Educational Psychology Review,* vol. 27, no. 3 (2015), pp. 371–389.
[12] Hanne De Jaegher, Ezequiel Di Paolo and Shaun Gallagher, "Can Social Interaction Constitute Social Cognition?", *Trends in Cognitive Sciences,* vol. 14, no. 10 (2010), pp. 441–447.
[13] J. Kevin O'Regan and Alva Noë, "A Sensorimotor Account of Vision and Visual Consciousness", *Behavioral and Brain Sciences,* vol. 24, no. 5 (2001), pp. 939–973.
[14] Zuzanna Rucinska, *op. cit.*

perceptually present through an active action of *seeing-in.*[15] This hypothesis finds support in phenomenological accounts of perception as a meaning-making act, or a process where meaningful perceivable elements allow new possibilities to be perceived.[16] Applying enactive metaphors in education means offering children a context where they actively explore and act out their understanding. A bodily involvement in didactic activities can accompany higher levels of understanding: gestures can add relevant information to children's learning processes, information that is not available in a solely verbal-representational format.[17] Educative interventions, especially those designed to foster learning through metaphorical processes, have in fact shown positive effects in terms of didactic results.[18] Furthermore, contexts where children can explore perceptual similarity in terms of colour, shape, texture and orientation between the source and the target have been shown to facilitate metaphorical comprehension and foster creative interpretation.[19]

3. Enactive Metaphors in Digital Learning Environments

Emergent technologies show significant potential in relation to the possibility of combining children's perceptions with immersive imageries, as to allow a more extensive interaction with the contexts ex-

[15] Gregory Currie and Ian Ravenscroft, *Recreative Minds: Imagination in Philosophy and Psychology*, Oxford: Oxford University Press, 2002.
[16] Maurice Merleau-Ponty, *Phénoménologie de la perception*, Paris: Gallimard, 1945.
[17] Jonathan Cole, Shaun Gallagher and David McNeill, "Gesture Following Differentiation: A Phenomenologically Informed Experimental Study", *Phenomenology and the Cognitive Sciences,* vol. 1, no. 1 (2002), pp. 49–67.
[18] Dedre Gentner and Phillip Wolff, "Metaphor and Knowledge Change", in Eric Dietrich and Arthur Markman Lawrence (eds.), *Cognitive Dynamics: Conceptual Change in Humans and Machines*, Mahwah, NJ: Erlbaum Associates, 2000.
[19] Bipin Indurkhya, *Metaphor and Cognition: An Interactionist Approach*, Springer Science & Business Media, 2013.

plored by children.[20] If we consider perception to be active and based on a set of interaction possibilities,[21] digital technology can hence be reinterpreted as a tool that contributes to predispose those peculiar contexts defined by Kirsh as *enactive landscapes*, meaning structures that offer chances to find new affordances based on the involved subjects' current interests.[22] By affordances we mean not only objects' perceptual properties, but also relational qualities: even though many properties are absent in unstructured objects, the shape of a peculiar object can suggest new affordances when explored and manipulated. When children act on props, their actions can be considered to be "guided" by the affordances perceived. Acting affordances can therefore explain the processes that allow children to perceive something different from what is present in terms of perception. Within learning contexts offering access both to non-structured materials and the possibility to explore it through digital technologies – for example, to create a visual narrative structure – we can offer preschoolers the possibility to augment their metaphorical imageries by not being limited to seeing a single possibility of interaction with objects. It appears, moreover, that the inherent meaning of an object is not what solely defines it. Instead, the social and communicative elements are those that appear to be central: what affects the objects, more than an individual instance, is in large part the fact that it is acted within intersubjective engagements. As claimed by enactivist accounts of meaning-making processes, new meanings can be established within an intersubjective space by leveraging social affordances and mutual understanding.[23]

An object can thereby afford different actions in the context of symbolic play. Yet, importantly, to consider such domains transfer as

[20] Shaun Gallagher and Robb Lindgren, *op. cit*.
[21] James Gibson, *The Ecological Approach to Visual Perception.* Classic edition. Psychology Press, 2014.
[22] David Kirsh, "Embodied Cognition and the Magical Future of Interaction Design", *ACM Transactions on Computer-Human Interaction,* vol. 20, no.1 (2013).
[23] Hutto Daniel and Erik Myin, *Radicalizing Enactivism: Basic Minds without Content*, Cambridge, MA: The MIT Press, 2012.

metaphorical activities, certain limitations need to be set. Drawing on Winner's instance, we can consider children's instances of metaphor (both verbal and visual) to be genuine if the new meaning-making process appears adequately grounded in resemblance,[24] even though – by comparing them to metaphors made by adults – we usually notice a lower level of metalinguistic awareness of the former.

4. Instances of Metaphor in Digital Stories' Creation Process

Within the Erasmus Plus STORIES[25] research project (2015–2018), a European project involving four countries aimed at promoting media literacy practices in early childhood education through the paradigm of digital storytelling,[26] various digital stories were created starting from the exploration of daily unstructured objects. During the creation of the story "A worm and a bird find new friends", a small group of 4-year-old children decided that a scene should be set in swamp, where some characters of the story they invented live (see Figure 1).

In this process, we can identify some propaedeutic elements of metaphorical processes: nevertheless, it represents a process centered on the search for resemblances, without implying a genuine production of visual metaphors,[27] like those about to be discussed.

[24] Ellen Winner et al., *op. cit*.

[25] The Research project "STORIES - foSTering early childhOod media liteRacy competencIES", funded by the European Union within the Erasmus + program, involves 17 Preschools and 4 Universities located in Finland, Germany, Italy and Turkey. Further information on the project, including some of the digital stories realized can be found at www.digitalstorytelling.eu.

[26] Chiara Bertolini and Annamaria Contini, *Digital Storytelling for Education: Theories and Good Practices in Preschool*, Rome: Aracne, 2018.

[27] According to Cathy Dent's study on visual metaphorical processes in children (Cathy Dent and Lois Rosenberg, "Visual and Verbal Metaphors: Developmental Interactions", *Child Development*, vol. 61, no.4, 1990, pp. 983–994), to consider a visual image as metaphorical, one element must be depicted in terms of another that differs in kind but bears an actual resemblance to the first. By referring to the above-mentioned study by Winner, Dent does not consider abstract and nonrep-

Figure 1: Children creating a digital story. Nicolò, in a dialogue recorded and transcribed by the teachers, argues that "swamps are black", and "they're always dark".Matilde agrees, arguing that in order to represent a swamp they could use a black mat, which they had been using during a previous moment of free play.

During the creation of the digital story "The consommé's city", for example, a group of 5 years old children decided to use a yellow balloon falling from a bottled water dispenser to narrate a scene where a spaceship throws a bomb of broth on a coloured word (see Figure 2). As underlined in the scientific literature, young children tend to focus on perceptual or surface-level similarities, such as

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resentational blocks to be visual metaphors. Moreover, drawing on Kogan's study (Nathan Kogan, Kathleen Connor, Augusta Gross and Donald Fava, "Understanding Visual Metaphor: Developmental and Individual Differences", *Monographs of the Society for Research in Child Development*, vol. 45, no. 1, 1980, pp. 1–78), pairs of depiction showing metaphorically similar objects are not considered to be visual metaphors, given the lack of a topic-vehicle interaction. Both elements have been considered within the hereby pursued analysis.

colour, shape or texture in order to make categorizations.[28] Focusing on the similarities that children identify on perceptual bases can make it possible to shift from usual conceptualizations, as well as to foster the exploration of possible novel ones.[29] The identified resemblance, in this case, is based on shape and colours, but in order to understand the scene the visual code must inevitably be connected to the verbal code. As suggested by Roland Barthes' "Rhetoric of images", the written message has an anchoring role: it reduces the polysemy of the image, by connecting it to a defined range of possible meanings.[30]

In order to show the explosion of the bomb, and the subsequent falling of the broth on the city, Marisol – a 5-year-old child – proposes to us a piece of yellow wool, and to throw it from a table while she's filmed. Before making such decision, the group discussed other possible solutions with the teacher (see Figure 3).

In this process we can observe how an important component of visual metaphor processing, namely the act of comparing objects belonging to different conceptual domains, can be positively affected by similarities that children identify in objects' characteristics. From the conversations, recorded and reported by the researchers, we observe how the children involved possessed the literal names of the objects in question, allowing us to consider the discussed processes as genuine instances of metaphor.

[28] Laura Namy and Dedre Gentner, "Making a Silk Purse out of Two Sow's Ears: Young Children's Use of Comparison in Category Learning", *Journal of Experimental Psychology,* vol. 131, no.1 (2002), pp. 5–15.

[29] Lisanne Van Weelden, Alfons Maes, Joost Schilperoord and Reinier Cozijn, "The Role of Shape in Comparing Objects: How Perceptual Similarity May Affect Visual Metaphor Processing", *Metaphor and Symbol,* vol. 26, no.4 (2011), pp. 272–298.

[30] Roland Barthes, "Rhétorique de l'image", *Communications,* vol. 4, no. 1 (1964), pp. 40–51.

Figure 2: Children preparing the set for the recording of the story. "We could represent the broth with some yellow temperas", says Marisol. "We could also find a circle-shaped object, like a balloon", answers Luca.

Figure 3: Children recording the story.

5. Conclusion and Discussion

Drawing on Lakoff and Johnson's Conceptual Metaphor Theory we have firstly discussed the concept of enactive metaphor, to then re-interpret early childhood symbolic play as a process of enactment based on children's capacity to perceive new affordances in objects. We have shown how this concept builds on the idea that seeing an object as something else demands a decentering process in representational terms, hence a participatory process generating new domains of social sense-making. We claim that this process can be facilitated by designing learning activities in contexts where preschoolers are offered the possibility to augment their metaphorical imageries by exploring non-structured materials and are offered access to digital technologies for the purpose of creating narrative structures including visual components. In order to consider the visual domains transfer processes carried out by preschoolers to be actual metaphorical activities, some limitations have been set by the authors. [31] Granted the lower level of metalinguistic awareness occurring in children's metaphorical instances, we ought to be certain of preschoolers' awareness of the literal names and the functions of the objects involved in the transferring process in order to consider such instances to be metaphors.

[31] AC is author of the sections 1,2. LM is author of the sections 3,4,5.