

# Diagrammatic Gestures.

## Cognition, Mathematics, and Semiotics. An Introduction

*Francesco La Mantia*

Università degli Studi di Palermo\*

[francesco.lamantia28@unipa.it](mailto:francesco.lamantia28@unipa.it)

*Maria Giulia Dondero*

FNRS/Université de Liège\*\*

[mariagiulia.dondero@uliege.be](mailto:mariagiulia.dondero@uliege.be)

*ABSTRACT.* There are words having an extraordinary evocative power. This is precisely the case of “Diagram” and “Gesture”. The first term covers an interconnected network of concepts like “graph”, “schema”, “form”, “model”, “arrow”, and so on... And the same can be said of the second one: just think, for example, of the ideas of “movement”, “bodily action”, “practical activity” or, more generally, of “doing”. Accounting for them has been, over the last 50 years, the aim of significant portions of the work conducted in philosophy (Deleuze, Foucault, Merleau-Ponty), mathematics (Grothendieck, Lawvere, Thom), semiotics (Peirce), and theoretical linguistics (Culioli, Langacker, Pottier). The present issue aims to present the state of the art with regard to the diagrammatic gesture, in particular by taking into account the relations between the disciplines mentioned and the arts and sciences.

*KEYWORDS.* Diagram; Gesture; Diagrammatic Gesture; Mathematics; Semiotics.

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\* *Correspondence:* Francesco La Mantia – Università degli Studi di Palermo, Viale delle Scienze, Edificio 12, 90128, Palermo, Italy.

\*\* *Correspondence:* Maria Giulia Dondero – F.R.S./FNRS Université de Liège, Centre de Sémiotique et Rhétorique, Place Cockerill 3, 4000 Liège, Belgique.



## 1. Two Terms, Two Theoretical Galaxies

There are words having an extraordinary evocative power. This is precisely the case of “Diagram” and “Gesture”. The first term covers an interconnected network of concepts like “graph”, “schema”, “form”, “model”, “arrow”, and so on... And the same can be said of the second one: just think, for example, of the ideas of “movement”, “bodily action”, “practical activity” or, more generally, of “doing”. Accounting for them has been, over the last 50 years, the aim of significant portions of the work conduction in philosophy (Deleuze, Foucault, Merleau-Ponty), mathematics (Grothendieck, Lawvere, Thom), semiotics (Peirce), and theoretical linguistics (Culioli, Langacker, Pottier). In particular, Merleau-Ponty’s phenomenology has represented an excellent framework for developing and evaluating the theoretical status of such concepts: On the one hand, the concept of gesture has been framed as the body’s expressive potentialities, with particular reference to the language of human activity (e.g. the concept of “linguistic gesture”); on the other hand, the concept of diagram has been developed so as to reframe the concept of the imaginary in terms of the deep and hidden possibilities of real-world things.

## 2. Diagrammatic manipulation

For as much as several other disciplines have engaged in a fine-grained analysis of the nexus between such concepts, it is possible to obtain a precise *cartography* of the main issues at stake. Consider, for instance, semiotics, a research field in which outstanding scholars have conducted in-depth examinations of the cognitive advantages of diagrammatical reasoning and of diagrammatic manipulation, in both the concrete sense and in the abstract or imaginative sense<sup>1</sup> in order to test such notions applied to scientific discourse and to experiments

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1 STJERNFELT 2007, QUEIROZ & STJERNFELT 2011, ECKES & GIARDINO 2018.

with images in science<sup>2</sup>. In this regard, we may consider the role played by diagrams in a variety of practices, including the use of diagrams in mathematical thinking and modeling, the use of infographics in the analysis of economic trends, the role of diagrams in computer-based analyses of population dynamics, or the diagrammatization of experience in the experimental sciences (biology, astrophysics) – to name but a few.

### 3. Diagrammatic Gesture

In more recent years, the notion of “diagrammatic gesture”<sup>3</sup> has generated considerable debates in fields such as aesthetics and the epistemology of modeling. The main themes addressed within such theoretical frameworks have been the following:

- 1 The diagrammatic gesture as a *bodily movement* in which it is possible to recognize a historical stratification of various forms of knowledge (mathematics, linguistics, morphology, and so on);
- 2 The diagrammatic gesture as a *regulated practice* within a *discipline of the body* – such discipline consisting, in turn, of *actions* (or of *praxeologies*) constrained by the aforementioned forms of knowledge;
- 3 The diagrammatic gesture as a *trigger of virtualities*, insofar as such virtualities are unpredictable future movements.

### 4. Art Projects, Mathematics, and Linguistics

The analysis of each of these themes has played a pivotal role in the development of several research programs, including the foundation

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2 DONDERO & FONTANILLE 2014.

3 CHÂTELET 1993 and 1994.

of an *epistemology of the mathematical gesture*<sup>4</sup>, the construction of *manipulation strategies* in fine arts projects<sup>5</sup>, and even the hypothesis of a *diagrammatology of enunciative forms* in linguistics<sup>6</sup>. Furthermore, many results obtained in the mentioned research fields have proved to be consistent with embodied and enactive approaches to the cognition<sup>7</sup>. For instance, this is the case of some analysis achieved by the epistemology of mathematical gesture. In this framework, it has been pointed out the possibility of retrieving the gestures that have been internalized into diagrammatic manipulations and, on the other hand, the possibility of accessing the way in which the mathematical experience constraints such gestures<sup>8</sup>.

## 5. Ouvertures

The analysis conducted on the relationship between the notions of diagram and gesture has allowed us to focus on the main key issues of the so-called *diagrammatic turn* in philosophy, semiotics, and mathematics<sup>9</sup>. Here is a short summary of the topics addressed:

- a Diagram and Gesture: Two Semantic Networks;
- b The Role of Diagrammatic Manipulation in Arts and Semiotics.
- c Diagrammatic Gestures: Main Themes at the Crossroads of Aesthetics and the Epistemology of Modeling;
- d Diagrammatic Thinking in Mathematics and Linguistics.

The papers here collected ventured to “sketch out” many of the issues we sought to expose in this introduction. In particular, you will find papers about: (1) the role of diagrammatic thinking in category theory (Alunni; Zalamea); (2) the epistemology of diagrammatic thinking in mathematics (Panza; Leclercq; Zalamea), in literary activity (Batt;

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4 MAZZOLA 2002; MADDALENA & ZALAMEA 2012.

5 QUEIROZ & ATÁ 2019, VITRAL & QUEIROZ 2018, DONDERO 2012.

6 CULIOLI 2018; LA MANTIA 2017 and 2020.

7 At least STEWART, GAPENNE & DI PAOLO 2012.

8 ROTMAN 2002, 256-7.

9 GANGLE 2016.

Zalamea), and in semiotics (Dondero; Migliore); 3) the role of the diagrammatic gesture in morphogenesis (Ferri), aesthetics (Dondero; Migliore), and philosophy (Batt; Alunni; Zuccaro; Zalamea). In short, these essays all deal with some of the most exciting issues in the current debate on the notion of diagrammatic gesture. We hope that they will generate new insights on this topic.

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