

# From Similarity to Homomorphism: Toward a Pragmatic Account of Representation in Art and Science, 1880-1914

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## Abstract

The years 1880-1914 were a time of intense experimentation in the visual arts. Representative conventions became variable, and artists deliberately departed from a concept of depiction considered as physical resemblance or photographic similarity. Visual representations progressed toward a conceptualization of figures and objects that transcended perceptual data, and the rendering of pictorial objects turned into an experiment involving complex visualization processes.

This paper explores the interplay between artistic and scientific representative practices between 1880 and 1914. I argue that science and technology acted as substantial challenges upon the concept of resemblance in art and that the rhythm of scientific and technological discoveries at the turn of the 20th century paralleled a shift from a notion of similarity to one of homomorphism in the conceptualization of pictorial representation. Homomorphism denotes representations which dispense with a point-to-point correspondence between depicted objects and perceptual data. I developed the concept from a scholarly study of Charles S. Peirce's pragmatic account of representation, and in particular his theory of iconicity. Peirce defined iconic signs as "partaking in the character of the object" (CP 4.531), that is, as preserving the same relational structure as their object. A theory of iconicity as homomorphism successfully exemplifies representative relations based on structure preservation. Applied to 20th century representative practice, homomorphism offers a plausible explanation for representations in which a considerable conceptual effort is required, independently of a point-to-point correspondence between depicted objects and perceptual data.

Using four case studies - the photographer Alfred Stieglitz and the painters André Derain, Max Weber and Pablo Picasso - I argue that representative practice between 1880 and 1914 was strongly informed by experimental scientific practices and that the shift from figurative to conceptual representation in art was triggered by a more significant theoretical shift involving representation as a general philosophical notion. Rather than a normative quest for the necessary and sufficient conditions for representation, I will propose a pragmatic evaluation of the means and strategies through which artists and scientists devise perspicuous and useful representations of the world. My analysis of the correlations between artistic and scientific representations at the turn of the 20th century aims to fulfill a twofold purpose. From a historical viewpoint, it draws significant parallels between the experimental aspects of representative practices in art and science considered as ways of exploring natural phenomena and intervening upon them. From a philosophical viewpoint, my goal is to propose a novel epistemological framework to assess how the shift in the conceptualization of representations affected subsequent styles of knowing and experimental practices in art and science. Ultimately, by combining the relative merits of historical and philosophical accounts of representation, I will argue for the advantages and desirability of a philosophically informed history of representative practice.

**Keywords:** Representative practices, art and science, iconicity, homomorphism

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Send feedback to: [philsci-archive@mail.pitt.edu](mailto:philsci-archive@mail.pitt.edu)