

“this grand book the universe” and the gene library: multimedia metaphors in scientific discourse.

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Metaphors have been recognised as fundamental elements both in the search for expanding the bounds of human knowledge and in efforts to articulate and understand scientific discourse. The tropes recurrent in scientific communication have been defined as tools through which, by precision of reference and principles of non-verbal codes, researchers accommodate language to the casual structures of the world (Boyd, 2002:500).

The source of scientific metaphors has been located in the dialectical interaction which experts engage with nature, accumulated disciplinary knowledge, current debates and their own investigation and findings. The main goal of their inquiry is to verify theories, models and techniques of investigation so as to carry forward specific ‘truth-making activities’ (cf. Brown, 2003). In this perspective, scientific metaphors have been framed in terms of their epistemological and pragmatic functions and then qualified as ‘theory constitutive’ agents inasmuch as they can inspire scientific advancement.

The discussion has provided insightful information on the importance of the trope in disciplinary genres. However, it seems to have left undisclosed the multi-semiotic systems which underlie scientific metaphors and differentiate their meaning-attribution processes from the ones associated with metaphors in literary genres (cf. Richards, 1936; Black, 2002).

The present paper suggests that the strands of multi-semiotic systems woven into scientific metaphors may contribute to rendering ostensive complex relational aspects of natural processes and entities both to the senses and to the mind’s-eye. The ‘epistemic access’ and the visual representations thus activated seem to have both hermeneutic and heuristic effects since they can trigger the generation of chains of ‘theory constitutive metaphors’ and open new pathways to both research and knowledge.

The origin of the process discussed is traced back to the metaphor through which Galileo Galilei (1564-1642) differentiated the goals and content of literary and scientific genres, founded modern science and set out its programme: “... this grand book the universe ... is written in the language of mathematics, and its characters are triangles, circles, and other geometric figures, without which it is humanly impossible to understand a single word of it;...” (Galileo [1623] 1958:238).

Then, the semantic, epistemic and pragmatic enterprise favoured by the integration of multimedia systems into discourse (cf. Lemke 1998) is illustrated by exploring the evolution of metaphorical term-concepts which characterise the study of phenomena such as *motion* and *refraction* and by relating to the components of a *gene library*.

Evidence will emerge of how, by blending ‘mental spaces’, metaphors have become begetters of scientific advancement and contributors to the modelling and understanding of aspects of the macro-, meso- and micro-physical worlds. It is thus suggested that the inclusion of both linguistic and other -semiotic systems in the study of metaphors may provide more adequate models not

only of the trope, but also of expository prose and in particular of scientific genres. The understanding thus engendered may in turn encourage dialectical exchanges between researchers of the human, social and physical sciences with consequent fruitful collaborations.

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