EXTENDED ABSTRACT

APPLYING GALOIS LATTICES TO THE INTERACTIONS OF THE VIRGIN AND CHILD IN BELLINI’S PAINTINGS

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We discuss in our work a method for the semantic description and analysis of figure paintings [1]. Our method consists in the construction of a Galois lattice, which is a hierarchy of categories [2], and in the use of current theories of categorization in cognitive psychology and of mother-child interaction in developmental psychology. We have applied this method to a sample of 98 pictorial representations of the Virgin and Child attributed to Giovanni Bellini (1426–1516) [3].

Coding mother-infant interaction, we find Fogel’s concept of “frame” [4] appropriate for defining interaction units as co-regulated patterns in specific contexts: for instance, the social frame depicts mutual attachment behaviors and orientation of the subjects toward each other. For dyadic relations (within the dyad alone), we coded: (1) the category of attachment, related to affective sharing and proximity-seeking (we distinguished three levels of attachment by considering mutuality of gaze, smiling, proximity and manual contact; (2) conflict of intention (for instance: autonomy of the Child versus dependence on the Virgin); and (3) scaffolding (the Virgin helps the Child to do what he cannot do by himself, for instance to keep upright or to walk). In the extra-dyadic situation (that of the dyad interacting with an object), we distinguished: (1) joint action; (2) offering; (3) request of attention (via the object); and (4) designation (or “proto-declarative intention”: the Child shows an object to his mother) [5].

Our analysis employed our computer program, Semantic Implication of

Fig. 1. Giovanni Bellini, The Virgin and Child, 65 × 48 cm, 1475. (Musée Fesch, Ajaccio, Corsica. Photo © RMN—Gérard Blot.)
Properties and the Galois Lattice (STONE), created by Sebastian Poitrenaud [6]. This program is based on categorization. A hierarchy of categories has a mathematical form called a Galois Lattice, which creates certain implied links between categories. Given that properties describing mother-child interaction (for instance: “the Virgin looking at the Child”; “the Virgin looking down”, etc.) are not independent, the set of properties can be organized in trees of properties using a principle of specific-to-general linkage of properties.

We analyzed the data by computing frequencies of features (i.e. properties). We described the entire set of Bellini’s paintings of the Virgin and Child (n = 98) using semantic trees of properties for line of sight, mutual gaze, closeness of the dyad, touching and manual activities, postures, gestures and action. We then analyzed the implications of properties that emerged from the Galois Lattice analysis.

Computing the properties, we have defined a prototype of Bellini’s paintings. This prototype corresponds to a pattern in which the mother’s attention is directed toward the child, who is not directing his attention toward his mother.

Bellini’s *The Virgin and Child* shown in Fig. 1 is a typical example of a painting illustrating a dyadic interaction pattern (medium level of attachment) (Fig. 1). The tree of properties in Fig. 2 describes the picture in Fig. 1. It is based on implication between properties. As illustrated here, the dyadic actions predominate. Among the dyadic actions, the Child’s behaviors prevail.

Finally, because it is based on very precise descriptive networks for the features “manipulated” in the paintings (objects and properties), a cartography (whether a graph, tree of properties or lattice) of these pictorial features can be set up for each picture, in order to facilitate its description, understanding and comparative analysis relative to other paintings and to evaluate artistic creation [6]. A diachronic study of dyadic and extra-dyadic patterns, as well as of interactional features within a single pattern, becomes possible.

Thus both developmental psychology and cognitive analysis of the categorization of objects and properties open new research perspectives for iconographical analysis and museology.

**References and Notes**

1. For the full-length article “Galois Lattices for Analysing Features of Interaction: Its Application to Giovanni Bellini’s Paintings (1426–1516) of the Virgin and Child” by Santolini et al., contact Arnaud Santolini: santolini@univ-tours.fr.


