How far is the superconcept of complexity useful in the production of art?

A superconcept is “applicable to many systems and in many disciplines”, but often finds its roots in one academic discipline (Wilson, 2010, p.40). This essay will apply the superconcept of complexity in the production of art. A succinct definition is as follows: “a complex system is characterized by emergent behaviour resulting from the interaction among its parts” (Ferreira, 2001, p.1). Finding its roots in mathematics and computer science, complexity theory aimed to counter the traditional, reductionist approach in scientific problem solving, through “breaking down complicated phenomena” (Galanter, 2008, p.312). Complexity theory is derived from systems theory; both share a concern with the relationship between elements within the system. However, Phelan (1998, p.238) suggests that while the latter seeks to “optimise some objective function”, the former is interested in observation and explanation of behaviours.

I suggest that the complexity model may be applied to the production of art, and this model helps us gain a holistic appreciation of the artwork. In this application, an artist’s concept, subject, tools and materials are the parts within the system. The resulting artwork is a manifestation of the aforementioned “emergent behaviour” (Ferreira, 2001, p.1). For the purposes of this essay, I have chosen focus on the concept of emergence through interaction, and I believe this focus will provide an insight to the application of complexity theory in art.

The essay will firstly address the second part of Ferreira’s definition of a complexity model – the interaction among its parts. Jackson Pollock’s abstract paintings provides a good example, and corresponds to organised complexity particularly. Organised complexity, classified by scientist Warren Weaver, is discerned by the strong interactions between its parts (Wilson,
2010, p.42), whereas disorganised complexity lacks this interrelation. With regard to Pollock, the parts that embody these interactions include the artist himself, as well as his tools: “dripping, fluid paint”, a paintbrush or a stick, and un-stretched canvas usually on the floor. (Emmerling, 2003, p.65). Each part is governed by and interacts with its own set of rules. For example, the production of a line by a brush or a stick will affect its texture; so will the fluidity of the paint. By nature of the artist using his tools, the complexity is organised and strongly interdependent, as the tools cannot move themselves. Pollock’s technique of drip painting, where he would “move his arm rhythmically about, letting paint fall” (Karmel, 2000, p.107), is also governed by the rules of the physiology of his arm and body; he cannot extend his arms beyond their reach, and the rotation of his arms are limited by his joints. On a more conceptual level, Pollock has stated that “A method of painting is a natural growth out of a need...to express my feelings” (Karmel, 2000, p.21). The urge in one’s brain to produce art is another interaction between neurological impulses and the body. While other artists may prefer different materials, mediums, and apply paint to canvas in a different manner, the framework of parts and their interaction may be applied in a similar manner, and are governed by similar rules.
Emergent behaviour, or emergence, in complexity theory applies to the resulting artwork from the interaction between the previously established parts within the artists’ process. The concept of emergence is reflected in Pollock’s statement that “…a painting has a life of its own…” (Frank, 1983, p.68). The spontaneous method of painting results in a new level of organisation – the artwork itself. The rhythm of Pollock’s actions is reflected in the rhythm of the overlapping lines; the qualities of the paint, light and dark establish the visual dynamism of the piece (see figure 1). These elements are the products of the artists’ thoughts and urges, and their qualities reflect the qualities of the tools used. Through this interaction, a new entity emerges as the artwork. Furthermore, another defining characteristic of emergence is the unpredictability of the final outcome, as systems cannot be reduced to their individual parts (Laughlin, 2005). Indeed, no one could have predicted the appearance of Autumn Rhythm by assessing the canvas, the paints, and the Pollock’s thoughts before he started working. Individually these parts are not a painting nor a system. Only through their interactions will an artwork emerge, and not even the artist himself could have anticipated its final appearance.
However, there are certain limitations when applying complexity theory to the production of artwork. One such limitation is to consider whether systems theory may be more applicable under some artistic practices. An illustration the movement of academic art, a genre governed by aesthetic rules under the influenced of European art academies. The curriculum in these academies were highly structured and taught specific techniques such as *chiaroscuro* and colour theory (Boime, 1986) that were expected to be used in artwork. Art historian Boime claims that the artwork that arises from this training produces “a calculated creation” (1986, p.20), and appeals to the rational mind; this is what is considered to make an artwork successful. Consequently, artwork produced under such specifications recall the concept of optimisation, since under the rules of the genre, there exists a way to improve, for example through a more harmonious use of colour or a more balanced composition. Capturing a scene or a concept becomes a problem that may be solved through the application of established rules, and the outcome is not so much a product of emergence as it is a product of optimisation.

Another limitation to the complexity model is evident when considering traditional or mechanical processes used for producing artwork. Vermeer’s paintings, for instance, involve

![Figure 2: Sol Lewitt 1982. Wall Drawing #370](image-url)
a less spontaneous process than that of Pollock’s. It has been proposed that Vermeer created his paintings with the aid of the *camera obscura*, an optical device that projected images of the rooms he wished to paint, complete with tonal and colour detail. He would then draft the projection onto the painting surface (Steadman, 2002). This method of painting challenges the notion that a painting is an emergent property, since the projection predicts the composition and lighting of the final painting, yet emergence should be unpredictable. Sol Lewitt’s conceptual compositions provide a modern example of this limitation (see figure 2).

The GEM Museum for Contemporary Art states that his wall art installations were created from specific instructions and diagrams that were executed by assistants (2016). Doing so fundamentally challenges the complexity model in which the artists’ ideas propels them to interact with their tools to generate art. When the process is streamlined through the use of imaging machines or assistants, the goal becomes more similar to that of engineering and management science, where achieving a result is of more concern than unpredictable, spontaneous emergence.

Nonetheless, I would suggest that the utility of complexity theory in the context of art comes not from perfect application of the model, but from the fact that we prefer to see meaning in artwork. Whereas appreciation of art through a lens of complexity adds meaning, a systems approach strips away the intentionality of the artist. Lewitt claims that in his work, “the idea becomes a machine that makes art” (Galanter, 2008, p. 19). It is possible to view his use of assistants as a part of the complex system, an interaction between Lewitt’s idea and tools. It is also possible that his assistants’ interpretation of instructions can influence the final artwork, thus it cannot necessarily be predicted, challenging the predictable pattern of behaviour in a systems model. We trivialise the artists’ concept if we view all art as simply
products of process that takes the idea to the final artwork; they embody more than the process. Additionally, art historian Martin Kemp suggests that Vermeer’s paintings are “virtually abstract on close viewing...we irresistibly see more than is actually there” (2000, p.33). Vermeer’s use of camera lucida may predict the composition, but the interplay between form, light, and atmosphere still requires artistic intention and the command of his tools. Once again by applying complexity theory, we recognise the value of the artwork not from the merits of individual elements, but as a whole.

Ultimately, I would argue that the complexity model has its uses as an analogy for the production of art. By relating the agents involved in producing artwork, we are forced to acknowledge the value of each part within the complex system: the tools, materials, as well as the artists’ concepts and actions. Whether it is Vermeer’s quiet interior or Pollock’s ecstatic lines, we do not judge elements such as form, light, perspective, or texture by in isolation, but within the context of an artwork and with each other. This interconnectedness is what complexity theory recognises and promotes. Consequently, the heightened appreciation of intention and the physical artwork fulfils the purpose of complexity as a superconcept.
Reference list:


List of figures:
Figure 1: Pollock, J., 1950. *Autumn Rhythm (Number 30)*. [Enamel on canvas] (New York, The Metropolitan Museum of Art).