

Elegant Experiments: Aesthetic Experiences by Cognitive Scientists

From the air pump experiments in the mid-17th century to theories of gravity and mathematical proofs, history of science reveals a continuous tradition of scientists, philosophers and artists praising science for its *beauty*, *elegance*, and *simplicity*. While the relationship between science and aesthetics is primarily investigated in contemporary philosophy of science, it has also inspired interdisciplinary research across philosophy, the sciences, history, and arts. For a long time the attention in this literature was almost exclusively on the aesthetics of scientific theories, reflecting a broader tradition in the philosophy of science where questions arising from theoretical work dominated the field for centuries (Franklin, 1989; Ivanova, 2023a). However, as illustrated by experiments in the early days of the Royal Society often having been staged as artistic performances, it is not just theory but also experimentation that has been historically intertwined with aesthetics and arts (Ivanova, 2021). Moreover, scientists often praise experimental designs or results by referring to them as ‘elegant’, ‘simple’ or ‘economical’, all terms that have been proposed to relate to aesthetic experience. Consequently, there is growing philosophical work on the role of aesthetics in scientific experimentation, such as identification of different ways in which experiments can be regarded as beautiful (Ivanova, 2023a, 2023b), discussions about the (in)stability of scientists’ aesthetic appreciations of experiments across different time periods (e.g., Parsons and Reuger, 2000), explorations of the role of profundity (Murphy, 2023), and negative aesthetic values in experimentation (Stuart, 2023). Furthermore, authors are starting to use diverse methods, including qualitative and quantitative ones, to explore aesthetic experiences of contemporary scientists in (experimental) practice (Ivanova et al., 2024). To date, these explorations have primarily been grounded in examples or case studies drawn from physics, mathematics, and, to a somewhat lesser extent, biology and chemistry.

However, if we are to gain a clear understanding of the diversity of aesthetic experiences that may be shaping both scientific experimentation and general scientific research, we need to start broadening our disciplinary focus. Thus, first we will build on previous attempts to fit biologists’ and physicists’ descriptions of aesthetic experiences collected in interviews (Ivanova et al., 2024) to a theoretical framework that describes how experiments are aesthetically appreciated (Ivanova, 2023a, 2023b). To do so, we examine the results of a survey that investigated whether cognitive scientists - without being prompted to do so - use aesthetic terminology or describe aesthetic experiences when asked to reflect on what they

consider to be their favourite experiment. Second, we focus on the notion of elegance, which has been put forward as the only factor that can claim aesthetic status *per se* (see Elgin 2020). Specifically, we examine cognitive scientists' conceptualisations of elegant experiments and discuss the prevalence of this aesthetic term in their discourse. In explaining what an elegant experiment is, most cognitive scientists referred to its simplicity, thus the results of this analysis show that a satisfactory account of elegance as an aesthetic property of scientific experiments must clarify the relationship between elegance and simplicity.

REFERENCES

- Elgin, C. Z. (2020). Epistemic Gatekeepers: The Role of Aesthetic Factors in Science. In *The Aesthetics of Science*. Routledge.
- Franklin, A. (1989). *The Neglect of Experiment*. Cambridge University Press.
- Ivanova, M. (2021). The aesthetics of scientific experiments. *Philosophy Compass*, 16(3), e12730. <https://doi.org/10.1111/phc3.12730>
- Ivanova, M. (2023a). What is a Beautiful Experiment? *Erkenntnis*, 88(8), 3419–3437. <https://doi.org/10.1007/s10670-021-00509-3>
- Ivanova, M. (2023b). The Aesthetic Value of Scientific Experiments. In M. Ivanova & A. Murphy, *The Aesthetics of Scientific Experiments* (1st ed., pp. 15–36). Routledge. <https://doi.org/10.4324/9781003263920-2>
- Ivanova, M., Ritz, B., Duque, M., & Vaidyanathan, B. (2024). Beauty in experiment: A qualitative analysis of aesthetic experiences in scientific practice. *Studies in History and Philosophy of Science*, 104, 3–11. <https://doi.org/10.1016/j.shpsa.2024.02.003>
- Murphy, A. (2023). Profound Experiments. In *The Aesthetics of Scientific Experiments*. Routledge.
- Parsons, G., & Reuger, A. (2000). The epistemic significance of appreciating experiments aesthetically. *The British Journal of Aesthetics*, 40(4), 407–423. <https://doi.org/10.1093/bjaesthetics/40.4.407>
- Stuart, M. T. (2023). The Future Won't Be Pretty: The Nature and Value of Ugly, AI-Designed Experiments. In *The Aesthetics of Scientific Experiments*. Routledge.