

Partial Substitutes for our World of Experience

Photographs as models in a systemic sense

My doctoral dissertation is an inquiry into the base principle of photographic technology,¹ aiming to define its agency within larger systemic wholes.² In addition to the key issue, my research has revealed similarities between photographs and the systemic view of models. This presentation builds on these similarities.

SIMPLIFIED PARTIAL SUBSTITUTES

Even though the universe is unconcerned with us, we, in our own peculiar way, are interested in it.³ Albert Einstein brought this up in his talk at Max Planck's sixtieth birthday in 1918. He described how we – painters, poets, speculative philosophers, and natural scientists – aim to understand the world by simplifying⁴ it in an intelligible way and then partially substitute our world of experience with these simplifications, to feel secure.⁵ We, so to speak, streamline our environment to make it easier to manage.⁶

From a systemic perspective, the aforementioned simplifications are models. In the same vein, photographs are models too, simplifying the three conceived dimensions of the world into pictures with no more than two. However, in this presentation, I do not approach photographs through their image qualities. Instead, I address them through technology, treating photographs as results of a process which renders time-varying physical quantities⁷ of electromagnetic radiation (often within, but not confined to, visible light) into static, time-invariant representations: simplifications categorisable as *sampled static event descriptions*.⁸

1 Cf. Arthur 2010, 33–34.

2 For example technology's essential role in the processes of knowledge production (Cf. Russo 2022, 194).

3 See Giere 2006, 32; Gibson 1986, 63.

4 Simplification is a way to generalise, which, according to philosopher of science Hans Reichenbach, is the gist of knowing and the core of explanation since to explain is to generalise (1951, 5; 6; 7). Every scientific law and model is an abstraction and idealisation of some part of reality, according to Bertalanffy (1969, 83; 98).

5 Einstein 2002, 43. Also the source for the title of this abstract.

6 See Weinberg 2001, 12.

7 Cf. Sinha 2010, 9. A general description of a signal.

8 Cf. Gustafsson, Lanshammar & Sandblad 1982, 40; 41.

PHOTOGRAPHS AS MODELS

In the following description, I have replaced *models* with *photographs* to emphasise the similarities between the two concepts. It is a generalisation from the perspective of the constructivist epistemology of systemic thinking:

By representing certain features of the order of reality,⁹ photographs act as links between theory and the world.¹⁰ From this position, they affect our knowledge of the world as well as our behaviour in it,¹¹ and, in that sense, photographs do not differ from maps, books, statistics, or equations.¹² Mimicking other entities,¹³ photographs act as analogies, being neither ends nor solutions but starting points for facilitating understanding.¹⁴ Consequently, photographs can be seen as epistemological devices,¹⁵ offering ways of thinking that can be fitted or applied to the world in the processes of knowledge construction.¹⁶

While strongly connected to the world, photographs are also incomplete, expressing only some characteristics of what they represent while simultaneously excluding others.¹⁷ They are never the territory, as Alfred Korzybski advised through the concept of a map.¹⁸ But even though photographs are not wholly true, correct or complete, they can be said to be more or less suitable for some particular purpose.¹⁹ Examined within their framework, though, photographs may be interpreted as true,²⁰ while also being both substitutable and disprovable. Used outside their purpose and framework, photographs may work absurdly,²¹ creating displacement instead of security as we seek to augment our 'narrow whirlpool of personal experience'.²²

As attempts to represent concepts that we aspire to understand through other things we perceive as understandable,²³ photographs can be considered

9 Cf. Bertalanffy 1969, 83.

10 Cf. Skyttner 2005, 97.

11 See Sismondo 2010, 163

12 Cf. Meadows 2008, 86; 172; Gustafsson, Lanshammar & Sandblad 1982, 27.

13 Cf. Skyttner 2005, 97.

14 Cf. Ward 2011, 44; Barton et al., 2004, 20.

15 Cf. Ison 2008, 148.

16 Cf. Glaserfeld 1984, 39.

17 Cf. Sismondo 2010, 163; Skyttner 2005, 97; Meadows 2008, 86.

18 Cf. Mella 2012, 100.

19 Cf. Gustafsson, Lanshammar & Sandblad 1982, 32; Russo 2022, 102-103.

20 Cf. Russo 2022, 137; 152; Skyttner 2005, 97.

21 Cf. Gustafsson, Lanshammar & Sandblad 1982, 31.

22 Quote: Einstein 2002, 43.

23 Paraphrasing Weinberg 2001, 28.

expressions of a language,²⁴ subjected to both possibilities and limitations.²⁵ These expressions, or statements, can not be independent of the human mind:²⁶ they are always by somebody, and may well tell more about the expresser than whatever the image depicts.²⁷ Despite being seen as author-specific expressions, photographs also always manifest the relation between the expresser and the technology used.²⁸ Thus, photographs are actualised affordances, the complementarity of both the animal and the environment²⁹, according to James J. Gibson's original description of the term.³⁰

INEVITABLY SUBJECTIVE INSIDE VIEWS

Photographs are us in the world, reacting to it and making sense of it, constructing simplified explanatory structures for comprehension. Yet we do not have the means to fully understand the world,³¹ because as parts of it, being evolved within our environment, we cannot observe it as outsiders.³² When we look at the world, it is as if the world looked at itself.³³ It is therefore impossible for us to escape the inevitable subjectiveness, partiality and boundedness of our expressions.³⁴ And regardless of what kind of substitutes we create for ourselves, what we understand and discuss are the models we make:³⁵ everything anyone knows is a model.³⁶

KEYWORDS

Model, substitute, simplification, systemic thinking

24 Cf. Checkland 1988, 100.

25 Cf. Gustafsson, Lanshammar & Sandblad 1982, 18; 33.

26 Cf. Glaserfeld 1984, 19.

27 Cf. Montuori 2011, 415.

28 See Arthur 2010, 78. Also: Language can be seen as a technology (Mufwene 2015, 97) based on Arthur's view on technology as an orchestration of natural phenomena to achieve a purpose (2010, 203).

29 Technology as a part of the environment provides the animal with the possibility of a photograph.

30 Gibson 1986, 127.

31 Cf. Flood 2010, 282.

32 Cf. Reason 1994, 13; 15.

33 Cf. Flood 2010, 281.

34 Cf. Flood 2010, 282.

35 Gustafsson, Lanshammar & Sandblad 1982, 32.

36 Meadows 2008, 86; 172.

RESOURCES

- Arthur, W. Brian. 2010 (2009). *The Nature of Technology: What It Is and How It Evolves*. London: Penguin.
- Barton, John, et al. 2004. A Maturing of Systems Thinking? Evidence From Three Perspectives. *Systemic Practice and Action Research* 17.1: 3–36. doi:10.1023/B:SPAA.0000013419.99623.f0.
- Bertalanffy, Ludwig von. 1969 (1968). *General System Theory: Foundations, Development, Applications*, 2nd printing. New York, NY: George Braziller.
- Checkland, Peter. 1988 (1981). *Systems Thinking, Systems Practice*. Chichester: John Wiley & Sons Ltd.
- Einstein, Albert. 2002 (1918). Motives for Research (Sonja Bargmann, transl.). In Alfred Engel & Engelbert Schucking. *The Collected Papers of Albert Einstein, Volume 7: The Berlin Years: Writings, 1918-1921. English Translation of Selected Texts*: 41–45. Princeton, NJ: Princeton University Press.
- Flood, Robert Louis. 2010. The Relationship of 'Systems Thinking' to Action Research. *Systemic Practice & Action Research*, vol. 23, no. 4: 269–284. doi:10.1007/s11213-010-9169-1.
- Gibson, James J. 1986 (1979). *Ecological Approach to Visual Perception*. New York, NY: Psychology Press, Taylor & Francis Group, LLC.
- Giere, Ronald N. 2006. *Scientific perspectivism*. Chicago, IL: University of Chicago Press.
- Glaserfeld, Ernst von. 1984 (1981). An Introduction to Radical Constructivism. In Paul Watzlawick (ed.). *The Invented reality: How Do We Know What We Believe We Know? Contributions to Constructivism*: 17–40. New York, NY: W.W. Norton & Company. archive.org/details/lish001ste.
- Gustafsson, Leif; Lanshammar, Håkan & Sandblad, Bengt. 1982. *System och modell: en introduktion till systemanalysen*. Lund: Studentlitteratur.
- Ison, Ray. 2008. Systems Thinking and Practice for Action Research. In Peter Reason & Hillary Bradbury (eds.). *The SAGE Handbook of Action Research: Participative Inquiry and Practice*, 2nd ed.: 139–158. London: SAGE Publications Ltd.
- Meadows, Donella H. 2008. *Thinking In Systems: A Primer*. White River Junction, VT: Chelsea Green.
- Mella, Piero. 2012. *Systems Thinking: Intelligence in Action*. Milan: Springer. doi:10.1007/978-88-470-2565-3.
- Montuori, Alfonso. 2011. Systems Approach. In Mark A. Runco & Steven R. Pritzker (eds.). *Encyclopedia of Creativity*, 2nd ed.: 414–421. London; Burlington, MA: Academic Press/Elsevier. doi:10.1016/B978-0-12-375038-9.09011-7.
- Mufwene, Salikoko S. 2015. The Evolution of Language as Technology: The Cultural Dimension. *Texas Linguistics Forum* 58: 92–117. asol.ling.utexas.edu/salsa/proceedings/2015/Mufwene.pdf.
- Reason, Peter. 1994. Inquiry and Alienation. In Peter Reason (ed.). *Participation in Human Inquiry*: 9–15. London: SAGE Publications Ltd. archive.org/details/participationinh0000unse/.
- Reichenbach, Hans. 1951. *The Rise of Scientific Philosophy*. Berkeley, CA: University of California Press.
- Russo, Federica. 2022. *Techno-Scientific Practices: An Informational Approach*. Lanham, MD: Rowman & Littlefield Publishers Inc. ebookcentral.proquest.com/lib/aalto-ebooks/detail.action?docID=7102521.
- Sinha, Priyabrata. 2010 (2009). *Speech Processing in Embedded Systems*, 1st ed. New York, NY: Springer Science. doi:10.1007/978-0-387-75581-6.
- Sismondo, Sergio. 2010. *An Introduction to Science and Technology Studies*, 2nd ed. Chichester: John Wiley & Sons Ltd.
- Skyttner, Lars. 2005. *General Systems Theory: Problems, Perspectives, Practice*, 2nd ed. Singapore: World Scientific Publishing Co. Pte. Ltd. ebookcentral.proquest.com/lib/aalto-ebooks/detail.action?docID=1681395.
- Ward, Thomas B. 2011. Analogies. In Mark A. Runco & Steven R. Pritzker (eds.). *Encyclopedia of Creativity*, 2nd ed.: 40–45. London; Burlington, MA: Academic Press/Elsevier. doi:10.1016/B978-0-12-375038-9.09011-7.
- Weinberg, Gerald M. 2001 (1975). *An Introduction to General Systems Thinking*, Silver Anniversary Edition. New York, NY: Dorset House.