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## Editorial: 50 years after Simon's Book The Sciences of the Artificial: Tributes, Appraisal and Prospects

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# 50 YEARS AFTER SIMON'S BOOK THE SCIENCES OF THE ARTIFICIAL: TRIBUTES, APPRAISAL AND PROSPECTS

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Editorial

50 YEARS AFTER SIMON'S BOOK *THE SCIENCES OF THE ARTIFICIAL*:  
TRIBUTES, APPRAISAL AND PROSPECTS

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# EDITORIAL

## 50 YEARS AFTER SIMON'S BOOK *THE SCIENCES OF THE ARTIFICIAL*: TRIBUTES, APPRAISAL AND PROSPECTS

Christophe Schmitt

This special issue of *Projectique* does not resemble the previous journal issues in many respects. In fact, this issue is intended to be unique because it aims not only to celebrate in 2019<sup>3</sup> the fiftieth anniversary of the publication of *The Sciences of the Artificial*, translated into French by Jean-Louis Le Moigne, but also to honor the memory of its author, Herbert A. Simon (1916–2001).

This thematic issue is also intended to a certain extent as a rehabilitation of Simon's work and its contribution to organizational theories. In fact, we have frequently noticed that Simon's work is mainly known for its contribution in terms of Bounded Rationality—which earned him the Nobel Prize for Economics in 1978—and Decision Making. However, in his book entitled *The Sciences of the Artificial*, Simon proposes another organizational theory, a unique theory to address the complexity of human action. This theory is well known in some sectors of organizations, especially among the constructivists. As we will see in this thematic issue, it underlies the approaches based on effectuation in entrepreneurship, and particularly helps realize that the natural and artificial worlds, to use Simon's vocabulary, are not governed by the same purposes, same mechanisms or same tools. This awareness is an

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3. We would like to thank Martin Cloutier and Laurent Renard from the University of Quebec in Montréal (UQAM) who were behind the idea of preparing this thematic issue. They coordinated the thematic issue of *Projectique* (2018/2) entitled "Designing Science Research: Issues, Debates and Contributions".

important turning point to deal with situations in which man is led to create, develop and even manage artifacts to enable human and collective action to occur within organizations. Through *The Sciences of the Artificial*, represent undoubtedly the most engaging part of the book. Simon restores the important role of design by making it a human activity in its own right rather than a specialty held by a few people. *The Sciences of the Artificial* stand as a real advocacy to overcome organizational silos, to encourage openness to others and even to human actions. Through the various contributions in this issue, all the components or part of Simon's work will be revisited, to explain important concepts and show their modernity for the authors, while highlighting their influence in current research and the limits that can be explored fifty years later.

Six contributors have agreed to take part in this issue celebrating the fifty years of Simon's work on *The Sciences of the Artificial*; their commitment and compliance with the various restrictions imposed by the nature of this special issue are gratefully acknowledged. The six contributions in this issue of *Projectique* are preceded by an article by Simon himself, translated for the first time into French<sup>4</sup>. It is in fact a lecture that Simon gave in 1987 and was subsequently published as an article in 1995 under the title "Problem Forming, Problem Finding, and Problem Solving in Design". This article is an extension of Chapter 5 of *The Sciences of the Artificial* which deals with the science of design. It can be strongly associated with our current society, for instance in terms of expert systems, computer-aided design and even artificial intelligence. Simon reminds us in this article that design is a dynamic process that helps redefine the objectives and constraints at different times, "design is subject to revision at all times". This is an incentive to reconsider the way we think about the complexity of human actions.

The first article in this thematic issue is written by Jean-Louis Le Moigne. At our request, he reconsiders his understanding of Simon's book, particularly his personal experience with the book and its translation into French. Le Moigne points out the originality and contribution of the book to research studies on decision-making. He also revisits different concepts that were new at the time and are at the core of the book, such as Heuristic Problem Solving and Bounded Rationality. By revisiting different periods of his scientific career, Le Moigne offers us an overview of Simon's *magnus opus The Sciences of the Artificial*.

The second article is written by Marie-José Avenier. She is particularly interested in showing that it is possible to consider *The Sciences of the Artificial* as a science in its own right that links scientific disciplines and professional practices. She sheds light on Simon's main concepts: bounded rationality, satisfactory solutions, goal-less design, near-decomposability of systems, distinction between state descriptions and process descriptions. In the second part of the article, the author provides few examples to illustrate her argument, showing how researchers have seized *The Sciences of the Artificial* to develop their scientific discipline.

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4. I would like to thank Jean-Louis Le Moigne for suggesting this article written by Simon.

In the third contribution, Saras Sarasvathy shares her testimony in relation to Simon's work, with a particular focus on the research she started as part of her PhD thesis conducted under the supervision of Simon himself; she had the opportunity to work with him on that study until his death. Sarasvathy reexamines her support to the sciences of the artificial in the field of entrepreneurship, leading her in 2003 to write an article entitled "Entrepreneurship as a Science of the Artificial" which shows clearly the relationship between the two researchers. She then examines the difficulties encountered in the scientific community regarding the sciences of the artificial, showing that this community often disproves speaking of a science in its own right. In the end, Sarasvathy's article shows how ideas are constructed and lived. Simon's *Sciences of the Artificial* is certainly, fifty years later, a turning point that urges us to wonder about their future.

The fourth contribution, that of Christophe Schmitt, deals with a specific aspect of *The Sciences of the Artificial*: the concept of design. Through his article, he shows that design is a relatively old concept but is largely influenced by Judeo-Christianity inherited from the Greek tradition: design is an exclusive privilege of gods, and it would be up to humans to ensure its proper functioning. In line with a Protestant concept of design, the originality of Simon's work would have been to propose an approach to immanent design rather than transcendent design. In light of this evolution, Christophe Schmitt shows in the second part of his article how it is possible to develop the concept of design through the model he established to understand the mechanisms related to the gaseous state of organizations, the 3M model: Me, My project and My ecosystem. Finally, in the third part, he explores the implications of this model to approach design within organizations by shedding light on the facilitator's position, compared to that of the repairer, while approaching organizations (through advice and research).

In the fifth contribution, Philippe Lorino examines in particular the contribution of Simon to the cognitive approach in the studies on organizations, an approach which he initiated in his book *The Sciences of the Artificial*, more specifically, in Chapter 3 entitled "The Psychology of Thinking: Embedding Artifice in Nature". The criticism proposed by the author shows the paradoxical aspect of Simon's work. While attempting to move away from the mainstream imposed by economy through "simplistic rationality", to use the author's words, Simon has consolidated an approach focused mainly on decision-making from a non-situated perspective, with little consideration for relational aspects. After a historical reading of the cognitive-based approach, Philippe Lorino highlights the contributions and limitations of Simon's work in the field of cognition. Building on the pragmatic approach, the author outlines avenues for future research in the coming years.

The sixth and final contribution is signed by Nicole Saliba-Chalhoub. This contribution conveys the impression of the disciplinary openness intended by Simon and which is in complete harmony with the spirit of *Projectique*. She suggests leaving behind the organization's mindset in which *The Sciences of the Artificial* were trapped for too long, to become mainly interested in the human complexity and artifacts. In that respect, she shows that it would be quite possible to consider psychology from the perspective of the sciences of the

artificial and, more particularly, the psychoanalytic treatment as an artifact. In the first part, Nicole Saliba-Chalhoub introduces the concept of psychoanalytic treatment developed by Sigmund Freud. She highlights in particular that the development of a project requires the involvement of two, both the patient and the therapist. The second part of the article aims to establish the link between psychoanalytic treatment and artifact. Useful links to address organizations can be found by particularly questioning the role of the researcher as an included middle to develop new insights on the subject under study. Finally, in the last part, the author reminds us that it is useless to look for purposes through artifacts and that, on the other hand, it is necessary to better interpret human activity in both its conscious and unconscious dimensions. From this point of view, there is still some way to go.

Within the framework of the fiftieth anniversary of Simon's book, all these contributions have offered a rich, complementary, contemporary and unique overview of *The Sciences of the Artificial*. Simon's work is dense and wide-ranging enough to inspire more researchers in the coming years. In the hope that this anniversary issue will increase the interest in *The Sciences of the Artificial* among our colleagues and inspire others to explore this book which has fascinated the contributors to this issue when they discovered it during their scholarly journey.