

DAVIDE SECCHI

COMPUTATIONAL
ORGANIZATIONAL
COGNITION

A STUDY ON THINKING AND
ACTION IN ORGANIZATIONS

Computational Organizational Cognition

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Computational Organizational Cognition

A Study on Thinking and Action in Organizations

By

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List of Abbreviations

ABM	— Agent-Based Modeling
ABMO	— Agent-based models of organizational behavior
AOC	— Agent-based computational organizational cognition
DA(C)M	— Dynamic Adaptive (Cognitive) Mechanisms
EDEC	— Embodied/Distributed/Extended Cognition
MOC	— Managerial and Organizational Cognition
MOR	— Management and Organization Research
OC	— Organizational Cognition
R	— Software for statistical computing
RECS	— Radical Embodied Cognitive Science
SDC	— Socially Distributed Cognition

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About the Author

Davide Secchi, PhD, is Associate Professor of Organizational Cognition at the Department of Language and Communication, Director of the Research Centre for Computational & Organisational Cognition, University of Southern Denmark, Slagelse. His research is organized around (a) rationality in distributed cognitive environments by using (b) empirical data and advanced computational simulation techniques, especially agent-based modeling. He has authored more than 80 among journal articles, book chapters, and books. He is founder and convenor of the Agent-Based Models of Organizational Behavior Workshop Series and has presented his work more than 100 times at major international conferences (2002–2020). He sits on the editorial board of *Kybernetes*, *Team Performance Management* and, since March 2020, he is Editor-in-Chief of the *International Journal of Organization Theory & Behavior* (Emerald).

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Preface

When I was invited by Flaminio Squazzoni at the University of Brescia in the North of Italy to give a lecture to his Master's students, I did not know what was going to happen. It was May 2018. The sun was shining, the futuristic look of the city provided a fantastic scenery, and the visit to the Ninth Century old San Faustino's convent in which the social science faculty is located simply blew my mind. "I miss this!," I thought, referring to what it means to breathe history daily, really unearthing sentiments of how much I miss Italy. And Brescia is not even *my* city! It just felt home. Anyway, I had the impression that the lecture "Implications of distributed cognition for leadership and team dynamics" did not go too well. I tried to do too much. I read the request from Flaminio for a lecture where I could present some of my research by connecting it to leadership, the topic of the course. In the first part, I talked about (bounded) rationality and cognition, and that did probably do the trick; students were engaged. The second part of the lecture was dedicated to a few of my agent-based simulations. I do not know why I decided to go on with such a review of my computational research. It probably was Flaminio, knowing who he is and what he does, the book he used in that course (it was [Goldstein, Hazy, & Lichtenstein, 2010](#)), or just my own ambition. That was probably too much for the poor students. But it meant the world to me. In an attempt to connect some of these simulations together, without purposefully planning it out, I outlined the very idea that is now this book.

There were a series of realizations (is "epiphanies" the right word here?) that made me understand what I was really aiming at as I was presenting my line of thoughts during the lecture. One was that 10 years had already passed from my book *Extendable Rationality*. That sounded like a long time. It felt a geological era, especially because many things had happened in my professional life. I was no more a young US scholar at the University of Wisconsin, with all the charm and vibrant force that such position brings. I was now back in the Old Continent, as I

first landed in England and then in Denmark, where I currently work. When I wrote the previous book (published in 2011), I never thought it was something to be continued. To some extent, I was right, the message of that book is that there is a possibility to extend the way in which bounded rationality is looked upon and theorized. This is exactly the point. I find myself more and more dissatisfied with discussions around and criticisms of bounded rationality because I believe it is no more a starting point for me. Of course, as it is clear to those who will read this book, I still consider myself a scholar of bounded rationality. But here is the first realization of my lecture Brescia: I had moved on!

By giving that lecture and discussing my research, I connected a series of models and studies that had been previously published in papers and chapters. The connections were very easy to make, even though I never thought about them before. Not in that way, at least. But it all made sense. All this time, and with the help of my co-authors, I have been looking at the theory presented in *Extendable Rationality* to verify its consistency, robustness, and developments. Here is the second realization: this research is all connected and follows a rather consistent thread.

* * * * *

This book is not just the story of the last 10 years of my work. In fact, I think of the book as a way to reflect on some of the concepts, models, theories, and approaches that usually accompany my enquiries. In order to be able to fully engage with this declaration of intents, the book is made of three parts: Part I to discuss advancements on distributed cognition, Part II to assess the theoretical elements in Part I through agent-based modeling, and Part III to summarize and discuss an alternative view of organizational cognition.

Before everything begins, I have decided to write an introduction (Chapter 1) that discusses the aim and scope of the book and summarizes its content, offering a roadmap to readers who want to jump directly to one chapter or the other. The first chapter in Part I (Chapter 2) serves as a connector to more traditional literature in organizational cognition. This is something I decided to add after a comment from one of the colleagues who reviewed the book proposal. The reviewer was concerned that those who did not read my other book and come from a more traditional background in organizational cognition studies would be left out. The reviewer was referring explicitly to scholars affiliated to the Managerial and Organizational Cognition (MOC) division from the US Academy of Management (AoM). I thought that was a good point. I never intended this book to be of sole interest

of MOC colleagues. My primary interest is the scientific community as a global project; of course, that includes colleagues from the AoM, but also those from all the other corners of the world and from other disciplinary perspectives.

* * * * *

As I did in the last monograph I wrote, a few words on what it means to write a book are probably warranted. Writing a book is one the most ancient ways in which scholars have communicated over the centuries. It is well engrained into the way European science has historically progressed. This means of communication is now entering a new phase, where its value, role, and effectiveness are questioned. Considering that a book should respond to the same criteria that apply to the evaluation of a journal article is one of the issues surrounding assessment of books as scientific outlets. Here are a few points, where I have tried to indicate how these two assessments differ (the list is not exhaustive):

- While journal articles have to strictly adhere to the literature that allows them to be published in the journal of choice, a book may select this literature more freely, since it is not bound to a specific outlet (i.e. the journal). In fact, the book is an outlet in itself.
- Journal articles have page/word limits that make them exercises in succinctness and conciseness; books do not abide to such constraints. A book is more valuable if it can be concise, but there are plenty of examples of excellent academic books that are all but concise.
- Journal articles cannot digress or explore sideline stories, if not sporadically; books can and should be actively taking those sideline stories and digressions, as far as they contribute to building a stronger argument. In other words, more than anything, in a book the argument is king.
- A book is an exercise in exploring a topic in full; an article targets one (sometimes, but rarely, two) specific aspect(s) of a topic.
- The audience of a given journal article is predictable – not always, but fairly accurately – while that of a book is much more unpredictable, because it presents itself free from the outlet’s (i.e. the journal’s) constraints.
- Using traditional or innovative constructs in an unorthodox way is almost unanimously banned from journal publications. It is

possible, sometimes necessary, to do that in a book, because one is more free to explore new horizons and has the time to explain why, how, and when.

If one agrees with the points listed above, then one shall also start reading this (and other) books with a slightly different mindset as of when one reads journal articles. In fact, even though it refers to several journal articles, this book is not a sum of possible papers, nor it is a simple sum of its chapters, considered individually.

With these considerations in mind, I hope you want to keep reading and I wish you a nice experience if you are going to.

Acknowledgments

The Italian academic environment is very formal or, at least, it was when I used to live in Italy (now almost 15 years ago). Some of the junior scholars used to refer to full professors by their titles, as in “Professor X,” and use the formal third person form. In some environments, this behavior could have been more relaxed, depending on seniority. When I was (very) young, my mother used to take me with her to some of the classes she was teaching and, as a child, I have always had a fascination with the academic environment. At that time, the old building where the Faculty of Economics was located at the University of Cagliari had giant black and white pictures of notable scientists on the walls, and books, books everywhere. I never actually reflected upon the fact that my mother was “Mrs” (Signora), and not “Professor,” to some of the junior faculty. She became full professor in Italy in a discipline and at a time where 95% of her colleagues were men. Some of these men had a difficulty accepting the fact that she was (still is!) a strong woman and better than them. Not just a better published scholar, but better cited, better with students, better in academic politics, better in attracting funds, and better in establishing partnerships with local enterprises. Not many colleagues had such a thriving and inspiring example at home. I consider myself extremely lucky having been able to look up to her. There are no words to express such an incredible intellectual debt. My work embeds this inspiring upbringing of mine. Thank you, mother, Professoressa Giudici!¹

During my early years, my mother was always taken by some academic project while my father was more relaxed in his work and philosophy of life. For many years my father used to receive phone calls from colleagues who asked about various aspects of their work. He worked

¹If you are wondering, of course, she read this book and provided feedback!

in the central administration office for the Italian Postal Services in Cagliari. These long conversations used to take him away from lunch or whatever he was up to. The calls did not stop after he retired. And he would still help! In fact, this service-driven mentality continues still today, after many years of retirement. He gives financial advice on how to navigate the intricacies of Italian tax law to those who need it and works as a volunteer for an association that is set to do just that. For many years, I failed to recognize how generous my father is and, probably, one of the reasons why I write about altruism is due to the example he set throughout his life. This is why there is another intellectual debt that I feel it is long overdue. Sometimes, actions speak louder than words and I believe this is a way typical of Sardinians to express themselves. Through his approach to life my father has taught me more than I have ever realized. Thank you, father.

As explained in the Preface, I owe this idea for a book to Flaminio Squazzoni and his invite to the University of Brescia for that seminar in the Spring of 2018. Thank you very much for serving as an inspiration.

I am extremely thankful to my colleague Stephen J. Cowley for our endless talks, seminars, workshops, papers, and conferences that made me realize the limits of my thinking and especially their potentials.

Dinuka B. Herath published his book *Organizational Plasticity. How disorganization can be leveraged for better organizational performance* with Emerald in 2019. He is the one who actually pushed me into writing this book. As a former PhD student of mine, I wish to thank him for the many things he has taught me. Daring to write another book is one of them.

All the colleagues with whom I discussed parts of what has gone into this book deserve a sound and wholehearted thank you. They are Billy Adamsen, Emanuele Bardone, Rasmus Gahrn-Andersen, Bruce Edmonds, Siavash Farahbakhsh, Nicole Gullekson, Dinuka B. Herath, Gayanga B. Herath, Fabian Homberg, Astrid Jensen, Martin Neumann, Laura Parolin, Raffaello Seri, and Yumei Yang.

The editor from Emerald, Niall Kennedy, believed in me since the beginning. Actually, since before I started to seriously think of this book. His nice emails and attempts to nudge me into a book project really worked as a motivation for me in that I would know that, once I had an idea, I could count on a publisher. His support has been exceptional, especially during the pandemic, when I could complete the work on my time as opposed to abiding to a strict deadline.

Last but definitely not least, an immense thank you goes to the love of my life, my wife Claudia. As we were all forced to work from home by the COVID-19 pandemic, she made sure I had some quiet time for myself so that I could write. I cannot fully express how fortunate I am to

have such a patient and caring person next to me. My now 11-month old son Luca gave me the force to recharge my batteries very rapidly when I was off my (too many) projects. His smile and daily developments have been a blessing.

Davide Secchi

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