

Roberto Casati, *The Cognitive Life of Maps*, MIT Press, 2024, 256pp., \$45.00 (pbk), ISBN 9780262547086.

In *The Cognitive Life of Maps*, Roberto Casati reflects on how maps, as well as many other superficially different but fundamentally similar kinds of representation, such as clocks and musical notation, aid us in navigation and other cognitive tasks. Chapter 1 begins by describing how using a map aids navigation by offloading the difficult task of visualising the terrain to an external tool. Casati also notes an analogy between this use of maps and the famous example of Otto's notebook discussed in the literature on the extended mind (Clark and Chalmers 1998), but he sensibly refrains from taking up the question of whether maps used in this way should be considered part of the mind, and instead proposes labelling the phenomena neutrally as "equipped-cognition". The rest of the book considers more, mostly map-like, examples of this phenomenon.

Chapter 2 revisits the now familiar semantics of maps first proposed by Casati, with coauthor Achille Varzi, in chapter 11 of their *Parts and Places* (Casati and Varzi 1999, 187–96). According to Casati and Varzi, what a map represents depends compositionally on what is represented by its atomic stages, where a *map stage* is any colouring of a map's regions, and a map stage is atomic if and only if it colours all and only the regions of a single shade (Casati and Varzi 1999, 192). Colours are like predicates: they represent properties. Regions are like names: they represent objects (Casati and Varzi 1999, 191). Hence, atomic map stages are like atomic sentences, other map stages are like complex sentences.

An atomic map stage is true, according to the semantics, if and only if (a) it colours a region of the map which represents a region of the world which has the property represented by its colour and (b) the region of the world represented by the rest of the map does not have that property (Casati and Varzi 1999, 194). So the blue atomic stage of the world map, for example, is true if and only if the region it colours represents a region covered by ocean, and the rest of the map doesn't. All other map stages, including whole maps, are true if and only if all their atomic stages are true (Casati and Varzi 1999, 195). The world map, for example, is true if and only if its green and blue atomic map stages are both true.

Casati's presentation of the semantics in this book is less formal and therefore more accessible than it was in *Parts and Places*, and most of his discussion focuses on pointing out the many ways in which ordinary maps are more complex than these

“formal maps”, as a preliminary to discussing the cognitive role of maps and artifacts more generally in the rest of the book. Nevertheless, since this semantics has played a central role in recent philosophical discussion of maps, it’s interesting to pause to see how Casati responds to this discussion. Michael Rescorla, for example, has argued the “absence intuition”, encapsulated in clause (b) above, undermines Casati and Varzi’s analogy between predication and map colouring, and so undermines their motivating analogy between maps and language too (Rescorla 2009b; see also Kulvicki 2015).

A natural response to this point would be to drop clause (b) from the semantic theory, and instead explain the absence intuition pragmatically, by appeal to the fact that cooperative mapmakers should include all relevant information (Blumson 2012, 427–30; Bronner 2015; Camp 2018, 33). Rather than accept this response, Casati opts to double-down, and argues for retaining the explanation of the absence intuition by including clause (b) in the semantics, while denying that this undermines the analogy with predication and language. To do so he draws another analogy between maps and lists, especially lists functioning as inventories, where any absences from the list are forbidden (Casati 2024, 52–53). I would argue the best explanation of this phenomena is still pragmatic, both for lists and maps. Be that as it may, the analogy between maps and lists is insightful. (It also reappears in chapter 7 (Casati 2024, 174).)

Another problem for Casati and Varzi’s semantics of maps concerns its ability to explain the productivity of maps or, in other words, how we are able to understand infinitely many maps (Blumson 2010). While not addressing this objection explicitly, Casati now argues that the assignment of world regions to map regions is “automatic” (Casati 2024, 58–59). Moreover, just as pictures are “naturally generative”, meaning that anyone who can understand one picture can understand any picture which depicts something they have the ability to recognise, maps are “hyper-generative”, meaning that anyone who can understand one map can understand similar maps, even without any perceptual ability to recognise what the map represents (Casati 2024, 61–65).

Chapter 2 closes with a discussion of the way the “formal” maps described by Casati and Varzi’s semantics differ from “ordinary” maps. This includes the addition of icons, text, and other symbols not recognised in the semantics, which he argues can be assimilated into the semantics in analogy with colours, so that a label such as the word ‘Paris’ on a map predicates the property of being Paris of the region it labels (Casati 2024, 68–72). Casati also makes clear that he includes as formal maps some representations that may ordinarily not be included, such as a North-American map

which, although it inverts east and west, and thus is the mirror-image of a normal North-American map, nevertheless meets all the conditions of the semantics (Casati 2024, 72–74). This sets the stage for the rest of the book, which discusses many kinds of representation which are map-like, but in a highly attenuated and abstract sense.

Chapter 3 compares maps with pictures. In discussions of picture projection, it is common to imagine rays emanating from the scene and intersecting a plane, which Casati calls the “Albertian window”. His main thesis about the relationship between maps and pictures is that pictures are maps of the Albertian window (Casati 2024, 83–87). He goes on to endorse the structural account of pictorial representation, and uses these to further distinguish between maps and pictures, but also expresses sympathy for the recognitional theory of pictorial representation, in arguing that by mapping the Albertian window the picture enables recognition of what it represents (Casati 2024, 87–90). He then contrasts maps with aerial photography and other pictures from the birds-eye point of view (Casati 2024, 91–94), discusses the relative priority of maps and pictures (Casati 2024, 94–96), and borderline cases including tables of contents, axonometric or orthographic projection, brain scans, celestial maps and diagrams.

Chapter 4 returns to the use of maps in navigation, and distinguishes between “red dots”, such as a label reading ‘you are here’, which marks the viewer’s location on the map, and “green dots” which mark the location of an arbitrary person or thing, and both of which may or may not be updated dynamically (Casati 2024, 109–21). Although Casati does not make the connection, this discussion is reminiscent of the more general discussion of self-locating in philosophy of mind and language, in which maps are a common example (Castaneda 1987; Lewis 1979; Perry 1979). The chapter moves on to discuss the more general phenomenon of “Borgesian maps”, after Jorge Luise Borges’ “On Exactitude in Science”, which describes a map drawn on the same scale as the empire it represents, which is thus completely useless.

Drawing on a previous paper (Casati, Kulvicki, and Zeimbekis 2020), Casati argues that maps of the same scales as and superposed upon the regions they represent are neither fantastical nor useless, but are common and practical. At my university, for example, the corridors which connect different buildings have yellow ceilings, and it’s possible to pass between every pair of buildings on campus while remaining under the yellow ceiling, which is especially useful during tropical storms. Casati holds that the yellow ceiling is a Borgesian map of my campus, which marks the routes between buildings on the same scale as the routes themselves. It is easy to find where you are

on a Borgesian map, since one's location on the map just is your location in the region it represents (Casati 2024, 128).

Chapter 5 is called “maps and models”, but it is mostly taken up by discussion of globes. Casati is especially interested in situated globes, whose axes are parallel to the Earth's axis, and which are situated so that the region representing their location is on top, in which case when they are illuminated by the sun, the illuminated region of the globe represents the region of the world in which it is daytime, and the shadowed region of the globe represent the region of the world in which it is night (Casati 2024, 136–44). This chapter also discusses several other examples, including astrolabes and sundials. That provides a bridge to Chapter 6, on clockfaces, which Casati argues are maps of sequences of temporal events, with the position of the hands functioning as a “red dot” for the present time of the viewer (Casati 2024, 151–58).

Further pursuing the analogy between maps and clockfaces, Chapter 6 points out if a clockface divided into twenty-four hours, instead of the usual twelve hours, is superimposed on an azimuthal projection of the Earth centred on the South Pole, and the map is allowed to rotate around the clockface every twenty-four hours, beginning from a position in which the region representing Greenwich is at zero, then the region representing the place of the viewer will be at the position of the clock representing the current solar time. Moreover, the viewer of the map could ascertain the solar time from their location, or ascertain their location from the solar time. Calling this device a “Chronogeoscope”, Casati reports he and his collaborator Glen Lomax have created a software version for educational purposes, which can be viewed [here](#).

In Chapter 7, Casati pursues an analogy between maps and music notation, in the course of which he outlines a semantics for classical western notation inspired by his semantics for maps (Casati 2024, 167–80). In Chapter 8, the analogy is extended to include mnemonics for ordered lists, including even numerals, lift buttons, subway diagrams, which Casati surprisingly does not regard as straightforward examples of maps, and even queues. After some concluding remarks in Chapter 9, a brief appendix discusses the role of maps and images in thought. This is a topic that could easily fill a whole book on its own, but it's surprising Casati did not engage here with the recent work on this topic most closely connected with his own map semantics (for example, Camp 2007; Rescorla 2009a; Blumson 2012; Aguilera 2016; Johnson 2015).

Another topic which one might have expected more in depth coverage of is the metric structure of maps – a lacuna inherited from the topological theme of *Parts and*

*Places* where Casati and Varzi's map semantics debuted – and the various systems of map projections. The latter is particularly surprising, as the choice of map projection is often tied to exactly the kind of cognitive considerations that Casati is interested in. For example, the familiar Mercator projection is useful since straight lines on the map represent rhumb lines, or the course of a ship following a constant compass bearing, whereas retroazimuthal projections, which accurately show the distances from a given point, may be preferable if one wants to illustrate the range of a nuclear missile (see, for example, the recent discussion of map projections in Rowińska 2024, 81–158).

While the topics on which Casati chooses to focus – like music notation instead of map projection – are not always what one would expect in a book ostensibly about maps, these idiosyncratic choices are part of the charm of the book. Plenty of ink has been spilt elsewhere on map projection and cognitive maps, but nowhere else can you read a comparison of maps and music notation, or a rigorous analysis of the pros and cons of queueing. Many readers of the *Cognitive Life of Maps* are sure to be surprised that it is not quite what one would expect from the title, as the book addresses a much broader range of representations than are traditionally thought of as maps. Although many readers may be surprised, few will be disappointed: they will be delighted.

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