Review of Selene Arfini, *Ignorant Cognition*, Springer, 2019

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Knowledge and ignorance have been treated asymmetrically throughout the history of epistemology. Not only knowledge has hogged the spotlight, but it has been widely understood as explanatory prior to ignorance. In recent years, however, scholars have started to counterbalance this tendency and the problem of ignorance has been gaining prominence in philosophy and related areas. Not surprisingly, and despite these recent efforts, finding a satisfactory philosophical definition of the notion has proven to be particularly difficult.

Ignorant Cognition, Selene Arfini's first book, is a bold attempt to face the problem of ignorance with full awareness of the issues mentioned above. Instead of ruminating about the analytical definition of ignorance, Arfini's strategy consists of exploiting our basic intuitions about ignorance throughout an analysis of its role in various dimensions of individual and social cognition. With a strong influence from Peirce's epistemology, she develops a thorough examination of the place of ignorance in the dynamics of belief and doubt, its influence on reasoning, and its "diffusion" in large groups.

The book is composed of twelve chapters (in an article-like format) grouped into three parts. Part I presents an epistemological analysis of the "fugitive" nature of ignorance, its role in belief fixation, doubt, and metacognition. Part II deals with reasoning under uncertainty and explores what the author calls the "tenacity" of ignorance. Finally, Part III puts the focus on social cognition, and in particular, on how ignorance spreads in online communities and how this affects individual reasoning in various ways.

It is impossible to do justice to all the sophisticated arguments and the wide range of topics that compose the book. In this review, I will focus on what I considered the most important and thought-provoking points of it.

Fugitive Ignorance

As said above, the first part of the book is devoted to explaining why ignorance has a "fugitive nature", and to exploring some of the consequences of this fact. Arfini's analysis mirrors John Woods' theory of knowledge and belief. According to Woods, an epistemic property is fugitive when it cannot be fully grasped or confirmed by the agent from

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the first-person perspective (Woods 2005). Truth seems to be fugitive in relation to beliefs because the attitude of believing a proposition *p* implies believing that *p* is true, regardless if *p* is objectively true. In Woods' words: "A belief is the condition of knowledge and the impediment of its attainment." (cited by Arfini, p. 49). Building on this idea, Woods defines the notion of epistemic bubble, i.e., a sort of epistemic state (consequence of the dynamics of our belief system) in which agents are not able to distinguish between their thinking that they know *p* and their knowing *p*. Woods defines the epistemic bubble as an "autoimmune" mechanism of cognitive systems since it prevents the agents from seeing the fallibility of their epistemic states.

Arfini claims that ignorance displays the same structural features. Understanding them, however, requires changing the focus from *belief* to the (much less attended) propositional attitude of *doubt*. Doubt is the epistemic state which gives us some minimal access to our ignorance, which is, just like knowledge, mostly tacit (see Chapter 2). Arfini directly builds on Peirce's epistemology to analyze this notion. She attributes to doubt three main properties: (1) it is a conscious state; (2) it has a phenomenological dimension that manifests itself as unpleasantly and irritation; (3) it requires inference to end (p. 37).

Now, Arfini thinks that the role of doubt in ignorance is somehow symmetric to the role of belief in knowledge: doubts are the only epistemic devices that allow the agent to grasp some of her ignorance, but they also induce her to think that she knows the limits of her knowledge. The author then advances the notion of *ignorance bubble*, i.e., a sort of illusion that makes the agent believe that she has her ignorance "framed" within her doubtful states, while her ignorance goes well beyond these states. Ignorance is then also *fugitive*; it cannot be fully grasped from the first-person perspective.

The epistemic and the ignorance bubbles form what Arfini calls a "cognitive autoimmunity system" (Chapter 3): belief and doubt are the only tools we have to attain knowledge and grasp parts of our ignorance; however, their intrinsic structure prevents us from seeing the blind spots of our knowledge and the real dimension of our ignorance (p. 54). As a consequence, the autoimmune system is the main obstacle that agents face for being able to distinguish between their knowledge and their ignorance. At the same time, this system is functional to our cognitive economy because "logically ideal" mechanisms of belief revision would be extremely effortful and resource-consuming, probably making belief and doubt ill-equipped to fulfil their main role, i.e., mediate between perception and action.

Finally, in Chapter 4, Arfini claims that the autoimmunity system can shed some light on the notion of "epistemic feelings" and their metacognitive role. Roughly, our propositional attitudes are often related to emotional states called "epistemic feelings". For instance, "*doubt, as the negative result of the metacognitive analysis of one's own beliefs regarding an information, is linked to the emotional consequences of "cognitive irritation" or "epistemic anxiety"...* While the state of belief, as the positive metacognitive validation of one's own beliefs regarding a set of data, is connected to the emotional answer of the "*feeling of knowing*" as a pleasurable state." (p. 58). Arfini argues that epistemic feelings are "entangled" with the cognitive autoimmune system. As a consequence, they have a limited influence on our (metacognitive) capacity to revise our beliefs in a non-biased way.

There is some lack of clarity in the explanation offered about the relation mentioned above, especially concerning the causal ordering of belief, doubts, epistemic feelings, and metacognitive judgments. Nevertheless, the main idea seems to be that epistemic feelings are about the presence or absence of a belief regarding some piece of information in our memory. But since they refer to propositional attitudes, and not to the information itself, they are functional to the autoimmune mechanism: "Since the agent will experience feelings that depend on her doubts and belief, and not relatively to the information they may

carry, the inferential process that an epistemic feeling enacts is subordinate to the cognitive autoimmune mechanism". (p. 59).

One issue with the framework advanced in the first part of the book is that it assumes that beliefs and doubts are "all or nothing" propositional attitudes. That is something that should not be taken for granted, since there are strong reasons to consider them as "graded" attitudes, and the notion of "degree of belief" plays a central role in Bayesian psychology and epistemology (see Staffel 2013). The fact that epistemic agents might have different levels of confidence in a belief implies that believing in a proposition *p* does not necessarily involve endorsing the truth of *p*. Clearly, accepting this would have a direct impact on the bubble theses and derivative notions.

Ignorant Reasoning

The second part of the book concerns the relation between ignorance and reasoning. To a significant extent, the question about how our inferential mechanisms are affected by our ignorance overlaps with the study of reasoning under uncertainty, which has a long history in psychology, philosophy, and AI (Chater and Oaksford 2004). Arfini presents here an original analysis that does not build on the mainstream probabilistic approaches to uncertain inference. However, it exploits the framework developed in the first part with a special focus on abduction.

The central claim of the first chapter of part II is that ignorance is tenacious. That means, essentially, that it is "not easily dispelled" (p. 68) through inference, even if we traditionally conceive reasoning as a mechanism that extends our knowledge (i.e., mitigate some of our ignorance). At the same time, the tenacity of ignorance is deeply interwoven with its fugitive nature and with the cognitive autoimmune system. Arfini's argument here is very much in line with widely accepted ideas in the contemporary psychology of reasoning. Navigating our environment requires fast and frugal cognitive mechanisms that allow us to reason and make decisions under uncertainty in real-time. For this, we use a plethora of reasoning strategies that are often successful from a "practical" perspective while being logically defective.

Arfini, who endorses a logicist normative framework, interprets this as a sign of the tenacity of ignorance because it shows that a big deal of our inferential activity neither extends our knowledge nor improves the quality of our belief system. Furthermore, the tenacity of ignorance through reasoning is deeply connected to its fugitive nature and to the ignorance bubble. In the words of the author: "*In a way, the fugitive nature of ignorance entails its tenacity because it immunizes the agent to recognize the fallibility of her ordinary reasoning. In another way, the tenacity of ignorance supports its fugitive nature because it prevents the agent to see her epistemic and ignorance bubble, as long as her reasoning drives her to her epistemic target (as it often does).*" (p. 72). A possibility for bending the tenacity of our ignorance appears when some of our reasoning strategies fail to deliver. According to Arfini, this can produce the emergence of doubt, and as a consequence, an opportunity to revise our beliefs and potentially mitigate some of our ignorance. Arfini understands this as a cognitive state and named it "investigative-ignorance".

To further develop these ideas, the author builds on Peirce's elusive notion of "habit", which adds a pragmatic layer to the epistemic states of belief and doubt. In particular, the notion refers to a "rule of action" that emerges from the fixation of a belief. Arfini proposes to extend the notion of habit to ignorance and introduces the idea of "ignorance-based" habit,

i.e., a disposition to generate an abductive inference capable of stabilizing a cognitive tension produced by the breakthrough of doubt when a habit of belief is broken.

Chapters 7 and 8 deal with abduction and model-based reasoning in science. Regarding abduction, Arfini defines it as “*a process of inferring certain facts and/or laws and hypotheses that render some sentences plausible, which explain or discover some (eventually) new phenomenon or observation*” (p. 87). According to the author, abduction is a central cognitive mechanism both in individual and scientific reasoning, and it is deeply connected to ignorance because it emerges from a state of doubt (and surprise), which is, as explained earlier, a manifestation of the agent’s ignorance. In her interesting analysis, Arfini tries to make sense of the fact that abduction can enhance knowledge while being mostly an ignorance-preserving type of inference. She makes her case by discussing two forms of chance-based discovery in which, with the aid of computational methods, abductive reasoning can mitigate ignorance to some extent.

To extend this discussion, Chapter 8 presents an original and intricate analysis of thought experiments. She proposes to understand thought experiments as conceptual metaphors, i.e., as cognitive mechanisms that exploit semantic knowledge of some conceptual domain X for illustrating or understanding features of an idea or event that it is not “natural” to X. The main claim here is that thought experiments, *qua* conceptual metaphors, display an abductive structure, and in this sense, they preserve ignorance. In particular, they are mental model-based abductions that do not extend our knowledge, but that play an important role by allowing us to rethink a problem in a different conceptual setting and come up with new and interesting questions about it (p. 132).

Part II offers a thought-provoking analysis of the role of ignorance in our inferential activities. There are, however, some remarks that can be made to this framework. One is that Arfini seems to assume a very “individualistic” view of reasoning and belief fixation, thus neglecting the fact that personal-level inference and belief revision are often embedded in dialogical contexts (see Brandom 1998; Dutilh Novaes 2013). Thus, even if we may mitigate some of our ignorance thanks to self-reflection on our faulty inferential mechanisms, a big deal of our belief revision is probably a result of social interaction and the dynamics of communication (see Mercier and Sperber 2017).

Another issue regards Arfini’s use of the notion of “fallacy”. As mentioned before, Arfini uses classical logic as normative framework. From that perspective, it is reasonable to see most of our inferential mechanisms dealing with uncertainty as “fallacious”, in the sense that they do not instantiate logically valid reasoning-schemes. The problem is that this classical logic is very limited as a normative framework for evaluating the quality of “everyday” reasoning. Some of the examples given in the book can be considered as instances of fallacious reasoning from a logical perspective, yet the most reasonable inferential moves in these contexts (p. 72). Some recent approaches to reasoning have shown that several inferential strategies and biases that are considered fallacious from a logical perspective are reasonable strategies if they are evaluated from a Bayesian perspective (Hahn 2020; Eva and Hartmann 2018). It could be interesting to try to combine Arfini’s ideas with these new frameworks that offer a richer perspective on the fallibility of our reasoning.

Ignorance Beyond the Individual

The third and last part of the book deals with the social dimension of ignorance. Arfini's main aim is to provide a set of analytical categories for understanding the role of ignorance in social life, with a particular focus on online communities.

A central question here is how ignorance is shared within communities. Arfini's approach builds on the notion of "cognitive niche". Cognitive niches refer to patterns of environmental configurations of objects, tools, and symbolic structures that agents manipulate in different ways to enhance cognition. Just like with the other cognitive/epistemological categories, cognitive niches are meant to analyze knowledge and knowledge distribution. Arfini tries to relate them with ignorance. She points out that similar mechanisms that in niche construction allow for knowledge distribution, also distribute ignorance. For instance, when the structure of a niche is set up for distributing some body of knowledge, it also transmits the epistemic and ignorance bubble associated with it.

Arfini describes three ways in which cognitive niches spread ignorance. First, through "covering beliefs" (i.e., beliefs that do some explanatory work for puzzling phenomena) preventing the agent from developing an inquisitive attitude and thus protecting her ignorance and epistemic bubbles. To give an example, some religious organizations can work as cognitive niches providing covering beliefs for natural phenomena like human and animal evolution, and thus preventing their participants from seeing their ignorance regarding more in-depth scientific explanations of this phenomenon. Second, cognitive niches also spread misinformation via physical settings that stimulate fallacious reasoning. The example used by the author concerns superstitions. In particular, hotels that omit using the number 13 (associated with bad luck) in floors and rooms constitute cognitive niches that diffuse and reinforce a superstition. According to Arfini, these omissions have an impact on guests' reasoning because they stimulate cognitive biases and because they could be potentially used for explaining and reasoning about different events during their stay. Finally, the third feature of ignorance transmission is related to the limitation of the affordances that objects and "concepts" could offer to agents through taboos. A taboo is a cultural prohibition against certain practices and objects that are considered immoral or dangerous for the lifestyle and values of a particular community. Arfini's point here is that taboos, as cultural devices that constitute certain cognitive niches, are obstacles for the agent's attainment of different kinds of knowledge. An example of this is Amish's taboos regarding modern technology and in particular smartphones. By banning the use of these devices, these communities limit the affordances of objects and the flow of information and potential knowledge that they may bring.

The two final chapters of the book offer an analysis of ignorance-spreading in online communities. Roughly, Arfini understands online-communities as *virtual cognitive niches*, that is, "*digitally-encoded collaborative distributions of diverse types of information into an environment performed by agents to aid thinking and reasoning about some target domain*" (p. 152). One distinctive feature of these social environments is that they have a double target domain: a virtual domain with its own symbolic and communicative dynamics, and the "real" off-line domain. The virtual domain has a strong predominance over the real domain, and it is dominated by a "socially-oriented instrumental intelligence". Arfini takes this as an underlying source of ignorance-spreading in online communities. People tend to judge virtual agents with the same criteria used to judge agents in real life, disregarding the fact that the online *personas* are partialized versions of the agents behind them, designed to exploit social biases and gain reputation and influence. Due to the fact that for matters of cognitive economy, we tend to be *docile* regarding how we filter and evaluate information coming from other people,

and because virtual environments are more concerned about establishing social bonds than by sharing high-quality information, online communities are fruitful environments for the diffusion of misinformation of all kinds.

Because of the increasingly important role that online communities are having in structuring social life, the problem of information spreading in these environments is crucial for understanding social cognition. Arfini makes a valuable effort to provide some promising conceptual tools to analyze this phenomenon. I believe that it could be interesting to see how these tools fit within (or interact with) more general theories of cultural transmission like Dawkins' *memetics* (Dawkins 1976), or Sperber's *epidemiology of representations* (Sperber 1996).

Overall, *Ignorant Cognition* is an ambitious attempt to develop a systematic approach to ignorance, covering a wide range of topics. I believe that Arfini successfully shows that ignorance must be studied from a holistic perspective, instead of from reductionist approaches that exclusively focus on categories like knowledge and belief. The book is solidly argued, and it combines ideas from several different disciplines in an interesting way. It might not be an easy read for those who are not familiarized with *Peircean* epistemology, but it certainly worth the effort of those interested in ignorance from a cognitive, epistemological, or social perspective.

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