

Review: Reasoning as Collaboration

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Book Reviews

REASONING AS COLLABORATION

The Enigma of Reason

By Hugo Mercier and Dan Sperber. Cambridge, MA: Harvard University Press, 2017. 395 pp. Hardcover, \$29.95.

A core proposal of both *The Enigma of Reason* and *The Knowledge Illusion* (Sloman & Fernbach, 2017) is that thought is a social endeavor. Thinking is not merely a cognitive process but a process that happens in a group. Interchange between group members leads to the emergence of new concepts, just as a wall of sound can emerge when just three members of a rock band play the right notes. The interaction between people produces layers of possibility.

It is a testament to the validity of this central thesis that both books came out at roughly the same time. The idea is in the air; it has permeated the community. Indeed, similar claims can be found in recent works on social influences on thought in the cultural cognition community (Kahan, 2012), on forecasting (Tetlock & Gardner, 2016), and on the formation of ideas (Pentland, 2014).

If correct, the suggestion must be more than the cognitive scientific fashion of the day. It is transformational. Once we start thinking about thinking as a social phenomenon, many of the basic tenets of cognitive science go out the window. No longer are working memory capacity and degree of executive control the keys to understanding the nature of reasoning and the determinants of performance. Instead, we have to think about what community an individual is embedded in, who the thought leaders in that community are, what other points of view they encounter, how central the issue they are reasoning about is to the

community's identity, and what the individual's role in the community is. For instance, we venture that the Pope will never endorse abortion, no matter what evidence accumulates. His role in his community just makes it impossible. The human mind evolved to be embedded in a community. This is a revolutionary perspective for cognitive science, though perhaps old hat for anthropology, sociology, and social and cultural theorists in psychology.

Another point of convergence: We could not agree more with Mercier and Sperber that work on human reasoning has focused too much on laboratory tasks (we must admit to being guilty of such focus in our own work). *The Enigma* opens up the analysis of reasoning to a whole world of possibility by bringing in data from the real world. In our book, we also tried hard to look at examples of human behavior from multiple real-world domains to gather evidence and illustrate our claims. We hope both books serve as a model for how to do cognitive science, by marrying laboratory and field work. Doing so may help change cognitive science from an endeavor that tries to identify the sources of task performance to one that tries to identify the sources of actual human behavior.

Our main aim here is to revel in the insight our books share: that cognitive science has to change the way it thinks about thinking. Thinking is a social enterprise, and that is a game changer. But our books present quite different pictures of the form of that conceptualization.

Reasoning Is About More Than Argumentation

The Enigma makes the case that reasoning evolved to serve an argumentative function. The book relies on the traditional "logistic" paradigm (in contrast to

the “new look” probabilistic paradigm, cf. Oaksford & Chater, 1991) to evaluate the accuracy of reasoning and to describe reasoning capacities. In its assessment of the quality of people’s reasoning about syllogisms or about the Wason four-card selection task, it makes the standard move of applying the criteria of propositional logic.

We frame the contribution of reasoning differently: Reasoning, in our view, is about the human ability to explain and predict the effects of actions and mechanisms in the world. It depends on our understanding of how the world works. For this reason, *The Knowledge Illusion* focuses on causal reasoning and evaluates the quality of people’s reasoning by their ability to explain and predict using causal considerations. To take one example, we do not think Cummins’s (1995) subjects were mistaken when they did not draw modus ponens inferences, because they were assuming that the presence of the antecedent of a conditional was not enough. The enabling conditions required by the mechanism insinuated by the conditional were also necessary. Cummins’s subjects were reasoning causally, not propositionally. This is what humans do.

The Enigma claims that reasoning is for representing a position in an argument and for evaluating others’ positions. It considers persuasion contexts and points out that the proper function of reasoning in such contexts is to argue a case. As *The Enigma* points out, options are often chosen by virtue of the social reason that they afford to justify choices to the decision maker and to others. *The Enigma* puts the point beautifully: “Reasons are primarily for social consumption” (p. 127). The book makes a strong and convincing case for this function of reasoning.

But argumentation is not the only function of reasoning. We do not even see argumentation as its primary function. *The Knowledge Illusion* contends that thinking evolved to support action, and argument is only one form of action. We suspect the selective pressures induced by the need to find food, outsmart enemies, invent new contraptions, and seduce members of the opposite sex were just as critical to the structure of the human mind as the ability to argue. Our book discusses a variety of functions of reasoning: to troubleshoot, to solve problems, to build and adventure, to make decisions, and, more than anything, to tell stories. Argumentation represents only a small subset of the functions of reasoning.

Consider the problem of design (of a living room, a book cover, a logo, or whatever). It is true that a group of designers might spend some time arguing

for their preferred approach. But most of the work of reasoning is in implementation: How can I satisfy the constraints imposed by my medium while achieving the goal I have set myself? This often involves trial and error, appeal to others’ work, and chains of reasoning about how to overcome obstacles. Other people are often involved because others have specialized knowledge and skills to bring to bear. The reasoning has nothing to do with argument; it is about accessing relevant knowledge and bringing chains of inference to bear.

Similarly, troubleshooting is not about taking a position and arguing for it. It is about recognizing patterns and recognizing when you fail to see a pattern. In the latter case, a model needs to be built and thought through, piece by piece, in order to identify what is broken and to reason about how it can be fixed.

Even argument does not necessarily involve arguing. Many arguments in social contexts consist of storytelling. Telling your children about Hansel and Gretel is more likely to dissuade them from wandering into the forest than an argument that compels the conclusion that forests are dangerous. That is why effective politicians are not logicians; they are storytellers.

We found some of the evidence adduced for the argumentation claim tenuous. It was fascinating to learn in Chapter 17 that the British parliament was won over by antislavery forces through force of argument, although we do wonder what economic and political forces were also at play at the time. What is clear is that the issue of slavery and the future of the slave trade were not decided in other parts of the world by force of argument. Indeed, historians have traced some of America’s most fundamental political divisions today to the fact that issues of slavery led not only to America’s most divisive war but to a cultural and regional partitioning that has never been reconciled.

Reasons Are Not Just Intuitions

On another issue, we could not agree more with *The Enigma*’s assertion that we generate reasons to justify decisions that we have already come to. The literatures on moral dumbfounding (Haidt, 2001), belief polarization (Lord, Ross, & Lepper, 1979), and the speed of decision making (Mormann, Koch, & Rangel, 2011) draw us irresistibly to the same conclusion.

However, we note important boundary conditions that parallel our qualms about characterizing reasoning too narrowly: When we know little and hence have

no intuitions, we must rely on a more structured kind of reasoning. For instance, should I turn the screw to the right or the left to tighten it? We have little intuition about this and must run little mental simulations or recite almost-forgotten ditties to answer the question. Similarly, how do I get to the hospital? Fortunately, we go rarely enough that we actually have to construct a route. How do I grill hamburgers? This requires a series of steps that must be ordered correctly or the family goes hungry. The kind of reasoning required in all these examples is more than using intuition to generate a reason. It involves unpacking structured knowledge to generate a sequence of rules and actions. Intuition is surely involved—perhaps at each step—but there is also a control process necessary to get the order and details right.

For this reason, we do not quite understand why the authors are so hesitant to approve of dual system theory. They seem to rely on it throughout the book to distinguish intuitions from reasons. It is true that reasons are generally the product of intuitions, and this has been acknowledged by dual system theorists (e.g., Darlow & Sloman, 2010; Evans & Stanovich, 2013). But reasons are not merely intuitions; if they were the authors would not feel the need to make such great use of the distinction.

Reasons are often strung together via some control process to unpack and make inferences about a structured representation. All the evidence suggests that the requisite control process follows different rules than intuition. So why not call them distinct systems?

Reasoning Is Not Only Linguistic

The fact that thought is a social enterprise gives language a crucial role in reasoning. Language is one of the primary media through which reasoning takes place. In principle, a group can come to a conclusion using only language as an interface. Surely many important problems have been solved over the telephone, in which auditory language is obviously the primary method of communication. It may well be that the medium matters: Perhaps language has an internal logic that constrains the conclusions people come to when natural language is their tool for social thinking, although we know of no successful proposals of this sort.

But language is not the only medium for social reasoning. Gestures are important, and joint reference to diagrams, photographs, sound snippets, and the world more broadly are often the means by which people communicate when reasoning together. We

have been known to spend minutes at a time pushing nodes and arrows around in an attempt to build an explanatory model of data without passing many words between us. There is nothing quite like language to mediate social reasoning, but it is not absolutely necessary.

So we are puzzled by *The Enigma*'s claim that "To be socially shared, reasons have to be verbally expressed and, indeed, reasons appear on the mental or public scene in verbal form." We have often seen people provide a reason for shutting up by simply darting a glance at someone who has just made an entrance. Reasons are not language, and language is not thought. It is important to distinguish them, because only by doing so can we begin to understand the mechanisms people use to reason.

How well does the interactionist theory account for group decisions?

The Enigma posits that reasoning is a joint affair. Effective decisions are not made by voting; they are made by collaboration (see p. 284). The book returns on several occasions to its primary form of evidence: People solve all sorts of problems better in groups than alone. This is a critical insight, and it parallels many of our own vignettes about how working together enhances education, medicine, flying planes and steering boats, building nuclear weapons, making decisions, and crossing the street—pretty much anything that people do.

But the argumentation theory applies only under special conditions. In the examples of reasoning and probabilistic judgment fallacies discussed in *The Enigma*, discussion benefits problem solving because the problem can be solved by one individual using a principle that is easily articulable and comprehensible by most others in the group. For instance, if one person sees that feminist bank tellers are a subset of bank tellers and understands the implications for probability, it is easy to convince others that the probability of the former must be less than the probability of the latter. Group discussion can surely be beneficial in other situations too—for instance, when different members of a group each can contribute independent knowledge or skills to an overall solution. But groups can sometimes exacerbate bad reasoning, as when groupthink sets in, mob mentality reins, or group discussion leads to polarization.

Conclusion

This is a bold and important book. Mercier and Sperber rightly point to the essential role of interaction in reasoning. Cognitive scientists rarely appreciate

the centrality of social factors. *The Enigma* paints a picture of individual thinkers embedded in a community. Our view is more radical: We would defend the claim that thought itself is a community enterprise and does not belong to any individual alone; what I think depends on what others think. We believe our view is more consistent with the fact that argumentation can lead to problems as well as solutions, as when members of a group take an invalid argument on board and become extremist. And you only need to look around to see how common this is. Nevertheless, thinking is a collaborative process, and that fact provides significant constraints on how to understand cognition.

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BENIGN ILLUSIONS IN A BENEVOLENT COMMUNITY OF KNOWLEDGE?

The Knowledge Illusion: Why We Never Think Alone

By Steven Sloman and Philip Fernbach. New York, NY: Riverhead Books, 2017. 296 pp. Hardcover, \$28.

In *The Knowledge Illusion: Why We Never Think Alone*, Steven Sloman and Philip Fernbach bring together two themes that have been much discussed in recent psychological research. The first theme (evoked by the title of the book) is the degree to which people assume they know more than they actually do. The second theme (evoked by the subtitle) is the extent to which human thinking is a social rather than an individual activity. The book does a very good job of introducing and illustrating both themes to a lay audience without entering into more technical or controversial issues that are mostly of interest to psychologists and philosophers. Even so, the way in which the authors articulate the two themes of the book is original and challenging.

“The story of this book,” the authors write in the *Acknowledgments*, “start with the work of Frank Keil.” In a famous 2002 article, “The Misunderstood Limits of Folk Science: A Illusion of Explanatory Depth,” Leonid Rozenblit and Frank Keil (2002) reported a series of elegant experiments where they asked participants whether they knew, for instance, how a flush toilet works. Most said they did. Then the participants were asked to actually *explain* what happens when they flush. Most were stumped. Sure, water flows and then there is this suction flushing away the contents of toilet bowl. But how is the suction actually brought about? Most people had no idea. They were suffering from an “illusion of explanatory depth”: a sense of understanding with no actual understanding. Similarly, most people believe they understand a wide range of policy issues. By asking participants who claimed such understanding to provide actual explanations, Sloman and Fernbach showed that this too, most of the time, is a mere illusion of knowledge (Fernbach, Rogers, Fox, & Sloman, 2013).

That we are ignorant of how most things work is hardly surprising: How could we have the time and competence to acquire all that knowledge, and