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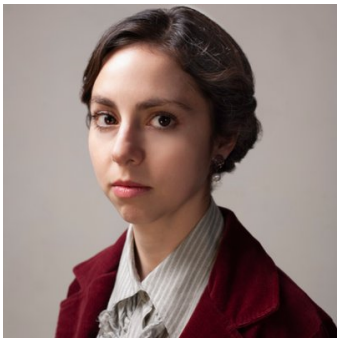
Guest Editorial

I am delighted to be serving as the Guest Editor for this issue of The Reasoner, and to share with you an interview with Philipp Koralus, Fulford Clarendon Associate Professor in Philosophy of Mind and Cognitive Science at the University of Oxford, where he is also the Director of the Laboratory for the Philosophy and Psychology of Rationality and Decision (LPPRD). His main line of work is on the erotetic theory. According to this theory, the aim of resolving questions is central to how the mind works. He has been working on the development of this theory with an interdisciplinary approach, joining efforts with collaborators from diverse backgrounds, including linguistics, psychology, and philosophy. The erotetic theory aims to explain both failures and successes of reasoning. There are various proposals to explain failures of reasoning such as our tendency to pick the wrong cards when we face the Wason selection task, or the phenomenon of so-called illusory inferences. Less attention has been paid to explaining how we can get classically sound reasoning, in this context. The erotetic theory developed by Professor Koralus and his collaborators aims to explain both of these aspects of reasoning through the role questions play in our thinking.



Nancy Abigail Nuñez Hernández
Maimonides Centre for Advanced Studies

Features

Interview with Philipp Koralus

Nancy Abigail Nuñez Hernández Could you start by telling us a little bit about your background, who you are, and how you got into philosophy?

Philipp Koralus When I was very young, I remember my mother walked me past a university building and explained what it was, though she did not have the opportunity to attend. I was immediately attracted by the notion that there is a business called academia in which it is people's job to come up with ideas nobody has thought before, and where some of those ideas might turn out to be worthwhile. Growing up, I was drawn to both the sciences and the humanities, the former for its clarity and rigor and the latter for its air of complete freedom. My first serious academic interest was artificial intelligence, as a kind of vehicle to study thought itself. However, I soon realized that I wanted to study the mind in a way that has a place

for the human first-person perspective. At the time, I was lucky to be able to leave behind some troubled schools and become a boarder at Brockwood Park. This school values meditative introspection and treats exams as secondary. Browsing the library and bookshops, I came across both Kant's *Critique* and Chomsky's *Minimalist Program*, as well as an anthology with papers by Fodor. Of course, most of it didn't make sense to me at the time, but some of the questions that were raised stayed with me.

NN So did you get into philosophy right away when you went to University? **PK** Not at all. It took me a couple of years in college to figure out that various topics that interested me in the humanities, cognitive science, and social science were united in philosophy. I was very lucky to be at Pomona College, a liberal arts college, that permitted that kind of exploration. The final turning point into philosophy came in a literature translation tutorial, of all places. At one point, the Professor, who was a linguist, had enough of me spending more time talking about concepts than about the subtleties of French syntax. He got up and marched me down the hall to the office of one his colleagues in the Cognitive Science Program, Jay Atlas, who is a philosopher of language. You might say I was a difficult student. I was lucky that Jay took the trouble to have a series of long conversations with me about logic, language, and philosophy. That was when I realized that philosophy had been my subject all along, even though I had not yet taken a single philosophy course! I then doubled up on coursework so I could be ready to apply for graduate school a year-and-a-half or so later. Since I had unwittingly been sifting my previous courses for whatever philosophical content they had, making this jump was easier than it might sound. Also, clarity of objective can give you a remarkable kind of efficiency.

NN Did this way of getting into philosophy influence how you see the discipline?

PK Mainly, I try to keep my office door open for promising students regardless of their degree specialty. For example, Vincent Wang walked into my office as a mathematics and computer science undergraduate at St. Catherine's College, Oxford. A few years later, we are now writing a paper together.

NN When you were at Princeton, you ended up doing a joint degree in Philosophy and Neuroscience for your Ph. D. How did that come about?

PK The most systematic theories of cognitive capacities seemed to me to be found in linguistics and in the cognitive neuroscience of vision. I had already read quite a lot of linguistics and psychology, and it seemed like I ought to learn more about the brain. I was able to petition the university to allow for a combination of philosophy and neuroscience. After doing some work on the neural correlates of moral judgment, with Walter Sinnott-Armstrong, Thalia Wheatley, and others, I gravitated back toward more "first person perspective" topics that were complementing my dissertation work on philosophy of language, particularly once I came across Phil Johnson-Laird's work, who eventually became a co-advisor along with Gideon Rosen and Gil Harman.

NN What is the main focus of your work now?

PK Reasoning and decision-making (I'll just say "reasoning" for short). Reasoning is one of the hardest and one of the most promising things we could study. Just think how many kinds of human activities, both practical and theoretical, ultimately revolve around what people conclude or decide.

NN Could you briefly explain the erotetic theory?

PK As I see it, if we want to understand the human capacity for reasoning, we need to understand both how this capacity allows for systematically correct reasoning and how this capacity engenders fallacies. The erotetic, or question-based, theory is an attempt to do both. Once we look at the mathematical formulation of the theory, things get complicated, but the underlying idea is quite simple. Reasoning always begins with an issue or a question. I say "issue" here to avoid any suggestion that thought is limited to natural language. Once we have an issue on board, we try to treat further inputs as answers to this issue, even in cases in which those inputs cannot settle it from a logical or probabilistic point of view. You might ask where those issues come from.

NN Let's say I asked.

PK A growing number of linguists have been arguing that various unexpected parts of language give voice to issues. For example, on this view, if we interpret the statement "there is an ace and a queen in the hand, or there is a king and a jack," that gives rise to the issue of whether we are in an ace-and-queen situation or in a king-and-jack situation. Let's imagine that we have a large hand of cards and are trying to decide what we may conclude about them. The erotetic theory holds that if we are now given the further information, "there is an ace in the hand," we will tend to treat this information as a strong answer to our issue – and we will end up concluding "there is an ace and a queen." But this is what Clare Walsh and Phil Johnson-Laird dubbed an illusory inference. Almost everyone makes this inference on a first look, but it is a fallacy.

NN How does correct reasoning come into the picture?

PK On the erotetic theory, if we had raised enough further questions to alert us to the possibility of there being an ace but no queen, before taking on board something as an answer, we could have avoided the fallacy we just discussed. The erotic theory holds that the same systems that produce fallacies also allow us to reason correctly – we just have to be more inquisitive. Beyond the toy example we just discussed, systematically correct reasoning and decision-making as well as a very large catalogue of seemingly unrelated reasoning and decision-making errors can be explained through similar question/answer patterns. Once we look at the mathematical representation of the theory, we can see that we can get classically sound reasoning and rational choice as special cases.

NN How does this relate to the cognitive psychology of reasoning?

PK Phil Johnson-Laird generously suggested in a previous issue of The Reasoner that I am making mental models compatible with logic. From the vantage point of cognitive psychology, a useful perspective on the erotetic theory would be to say that I am on board with the view that inference is a matter of the dynamics of updating mental models. I would then add that the nature of this update process, both in reasoning success and in reasoning failure, is explained by the relationship between questions and answers, and that we should make mental

models and their dynamics mathematically precise.

NN How did you come up with the erotetic theory? **PK** The core of it emerged as a collaborative effort with Salvador Mascarenhas. My own starting point was becoming convinced that we interpret sentences relative to a question we seek to answer, and that this question has psychological reality as a mental model. I took some tentative steps toward formalizing mental model theory to articulate this view while I was at the Institute for Advanced Study at the University of Notre Dame. Around the same time, Salvador, whom I had met at the now legendary 2005 LSA meeting at MIT [celebrating 50 years of Chomsky's *Logical Structure of Linguistic Theory*], was working on the logic of questions and its application to semantics. When I later moved to the Philosophy-Neuroscience-and-Psychology Program at Washington University in St. Louis, I invited Salvador to give a guest lecture in a seminar, and it became clear to us over dinner afterwards that what we had individually done could add up to a theory of reasoning. Kit Fine provided some useful suggestions as well. It then only took about three or four months to write a draft of the first formally complete erotetic theory for propositional reasoning. During chunks of that time, Salvador and I were basically occupying a common room in the NYU Linguistics Department, yelling at each other and laughing in equal measure in front of a white board. We'd occasionally take breaks to eat take-out and watch episodes of *Game of Thrones* to keep symbol fatigue at bay.

NN Tell us more about your lab at Oxford.

PK I started the laboratory for the philosophy and psychology of rationality and decision (LPPRD) to continue doing interdisciplinary work. Generous support from the Laces Trust and St. Catherine's College allowed me to bring Salvador to Oxford before he founded his own group at the École Normale Supérieure in Paris. More recently, I have collaborated with Vincent Wang and Sean Moss, two mathematicians, and Beau Mount, a philosopher, on increasing the expressive power of the erotetic theory to quantification. I have also collaborated with Mark Alfano to apply the erotetic theory to moral judgment, and with Jens Madsen, Ernesto Carrella, and Richard Bailey (respectively in psychology, computational economics, and geography), to use the erotetic theory in a computer model of decision making for natural resource management. We've also got some projects in the works with Sunny Khemlani.

NN What do you think about interdisciplinary collaborations in light of that experience?

PK Interdisciplinary collaborations happen naturally if one is dealing with questions that belong to multiple disciplines. I largely forget people's home discipline once work gets under way. Beyond a commitment to rational inquiry, you just need enough slack in the system for informal interactions in which researchers might discover shared interests. Institutions that provide food and drink without some immediate agenda have a natural advantage. **NN** What do you think about experimental philosophy?

PK Empirical work conducted by philosophers is often excellent when the questions being asked are of the kind that can be settled by empirical work. In that case, results are often very robust since they tend to involve effects that are strong enough to be *almost* available by introspection. It can be good psychology unhampered by professional pressure to be methodologically clever for its own sake.

NN What do you enjoy the most about being a member of Oxford's Faculty of Philosophy?

PK What I like the most about Oxford is the overall sense of intellectual freedom. This seems to me to be closely connected to the fact that the center of gravity of the University is made up of over 30 colleges that have a considerable degree of administrative and financial independence and that are largely governed by the consensus of their Fellows. The element of decentralization may be part of what explains the resilience of the institution through history. People have been teaching philosophical texts here since at least 1096. Perhaps surprisingly, Oxford is less hierarchical than many other universities. The fact that we sometimes wear gowns is often misunderstood from a distance. I see the unusual amount of ceremony as another strength of the institution. It is a way of collectively bearing witness to the intrinsic value and dignity of the scholarly enterprise, which includes students, academics, and staff. You might say that all sounds like a bit much, but I think we should not be afraid to celebrate these things.

NN What do you feel passion for besides philosophy?

PK I would like to say culture in most of its forms, both "high" and "low". There usually end up being feedback loops into work. Behind me where I sit in my office is a print that resulted from a collaboration between the artist Geraldine van Heemstra and the Thai-British composer Prach Boondiskulchok, who is a good friend, visualizing one of his piano pieces. I am not musical but I find it resonates with my thought processes, so I enjoy seeing it when I get to my desk.

NN What is the first thing you would advise someone interested in the erotetic theory to read?

PK A good starting point would be the following:

Koralus, P., & Mascarenhas, S. (2018). Illusory inferences in a question-based theory of reasoning. https://doi.org/10.1163/9789004365445_011

Koralus, P., & Alfano, M. (2017). Reasons-based moral judgment and the erotetic theory. http://psycnet.apa.org/record/2017-16691-004

If that looks sufficiently interesting, you could keep an eye out for my book *Reason and Inquiry*, which I am in the process of completing for Oxford University Press. There, I present the erotetic theory as a more general mathematical approach to problems in reasoning and decision making.

News

Scientific Reasoning in Action—From the Early Modern Period to 1900, 10–12 October

The workshop *Scientific Reasoning in Action—From the Early Modern Period to 1900* was held from October 10 till 12 in Ghent, Belgium. It was the eighth workshop in the *Logic, Reasoning and Rationality* series supported by the Research Foundation Flanders (FWO) through the scientific research network on *Logical and Methodological Analysis of Scientific Reasoning Processes*. The network brings together research groups from nine European universities carrying out research on relevant topics: Adam Mickiewicz University Poznań, Free University of Brussels, Ghent University, Ruhr-University Bochum, Tilburg University, University College London, University of Antwerp, Utrecht University and VU University Amsterdam. For the duration of the project, from 2016 till 2020, two workshops are organized every per year (one in spring and one in autumn). The eighth workshop was organized by the