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Editorial

Wolfgang Spohn is no stranger to the readers of *The Reasoner*. Four years ago Matteo Morganti interviewed him on his work and his views

on the state of the philosophy of science. At that time, Spohn mentioned a book on ranking theory he was working on. With this book, ranking theory was supposed to be "reaching adulthood". Last year, *The Laws of Belief: Ranking Theory and Its Philosophical Applications* was finally published at OUP. It was distinguished by the Lakatos Award 2012. This is good reason to take a closer look at ranking theory.

Spohn developed ranking theory in the early 80's in order to overcome problems he found with Peter Gärdenfors' account of the dynamics of belief. He introduced ranking functions as so-called ordinal conditional functions to the scientific community in 1988. Since then, Spohn's philosophizing was strongly influenced by the work on ranking theory.

Though ranking theory is a theory of rational belief change, its basic notion is that of a degree of disbelief. The rank of a proposition is a non-negative integer that indicates how strongly an agent disbelieves this proposition. For this reason ranks are sometimes called negative ranks. These degrees of disbelief trivially determine the extent to which a proposition is believed: if a proposition is disbelieved to some degree, its negation is believed to that degree. If an agent neither disbelieves a proposition nor its negation, she is indifferent.

While preparing our interview with Wolfgang Spohn we discussed how influential ranking theory is today. It seemed to us that while the existence of ranking theory is well known, its content is rarely studied. To many it may seem that subjective probability theory is all the theory of degrees of belief they need, giving them no reason to invest into getting familiar with the (not so) alien mechanism of ranks. We think that this is unfortunate. Probabilities are just one possible way to measure degrees of belief. It is very illuminating to investigate the alternatives and compare their consequences. We are also sure that most readers will find ranks a very natural and useful way to understand degrees of belief, after having acquainted themselves with them. Many useful applications in philosophy of science and epistemology are forthcoming.

It is much to be hoped that the Lakatos Award will attract further attention to ranking theory and motivate researchers to dive into the realm of ranks.

Benjamin Bewersdorf
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Features

Interview with Wolfgang Spohn

Wolfgang Spohn is Professor of Philosophy and Philosophy of Science in the Department of Philosophy of the University of Konstanz. Over the last 30 years he has de-

veloped a comprehensive theory of rational belief change called ranking theory. This theory is discussed in great detail in his most recent book *The Laws of Belief: Ranking Theory and Its Philosophical Applications* (OUP 2012) for which Wolfgang Spohn has received the Lakatos Award 2012.

Corina Strößner and Benjamin Bewersdorf: When Matteo Morganti interviewed you for *The Reasoner* in 2009, you where hoping to finish *The Laws of Belief* in that year. Now, we all know that such things have a way of always taking longer than expected. In your case, what were the main challenges you had to overcome in getting your book from your head into our hands?

Wolfgang Spohn: First, I started rethinking almost everything and found improvements of my older papers at many places. This was fun, but it took a lot of time. The major difficulty was to find sufficient time for such a huge work besides ongoing obligations. There I sometimes despaired, but also got a lot of support by additional sabbaticals. A major challenge was to keep up with the literature. The book covers a lot of ground. The older chapters were several years old, when I finished the more recent ones. It seemed I could go on revising forever. Here, I simply gave up in the end.

SB: The topic of *The Laws of Belief* is ranking theory. Ranking theory is a formal account of rational belief change, but it is not the only such account on the market. In particular, both Bayesian epistemology and the AGM belief revision theory are very popular and well-developed theories of rational belief change. Can you explain how ranking theory relates to its rival theories and why you think another approach to rational belief change is needed?

WS: The big *difference* between probability and ranking theory is: the latter has the notion of belief, and the former doesn't. In the literature, belief is often qualified by various adjectives. This indicates uncertainty about the notion of belief. I cannot share such worries. To believe A is to take A to be true. This is clear enough, even though I admit its vagueness. And it entails the law of conjunction: If you take A to be true and B to be true, then you can't rationally fail to take $A\&B$ to be true. However, there is no probabilistic account of that law and thus none of belief. The Lockean thesis (belief = sufficient degree of belief) is simply false for probabilistic degrees, though it is true for ranks (i.e., ranking-theoretic degrees). Thus, you can either join Jeffrey's radical probabilism and say there is no theoretical need to talk of belief, or you can say you want to talk of belief and then design a different theory for it, as I did. However, you *should* want to talk about belief. Beliefs can be true or false, probabilities cannot. So, if we search for the truth, we can only describe this in terms of belief. The basic principle relating belief and meaning is the disquotation principle: if you seriously and sincerely assert "p", then you believe that p. You need the notion of belief for stating this principle. And there are many more reasons.

The big *similarity* between ranks and probabilities is: you may formally take disbelief as infinitesimal probability, so that belief in A is having a probability for A of at least $1 - i$ (for some infinitesimal i). Thereby, the axioms of probability theory translate into

the axioms of ranking theory. Of course, this would be inadequate as an interpretation of belief; you could bet your life on such probabilities, but usually you do not rely so firmly on your beliefs. However, the formal translation explains why so much of what is familiar from probability theory holds in ranking theory as well. This translation has been a guiding line in my book (though one must take care, it does not always work), and it came as a surprise, even to me, that it always makes good and novel sense. So, this turned out to be a really successful research strategy.

However, we must not conclude that ranking theory could be reduced to probability theory, not even formally. Rather, when trying to perfect the probabilistic point of view, you end up with merging probability and ranking theory (as I show in section 10.2).

The crucial criticism of AGM belief revision theory is that it offers only an incomplete dynamics; the problem of iterated belief revision is not completely solved. Ranking theory, by contrast, offers a complete dynamics of belief, with all the accompanying advantages such as an adequate notion of conditional belief, of epistemic relevance and independence, etc. Indeed, the axioms of iterated contraction are completely stated. I do not really understand the motive behind looking for further incomplete solutions of the iteration problem.

Formally, ranking theory is a strengthening of AGM belief revision theory, insofar as the AGM theory works with ordinal entrenchment orderings, whereas ranking theory works with cardinal entrenchment gradings. On the one hand, the cardinality is responsible for all the formal advantages. On the other hand, the cardinality met a lot of reluctance: "Where do these numbers come from?" However, this reluctance is no longer justified, since there is a complete operationalization or measurement of ranks in terms of iterated contraction (just as there is the old AGM operationalization of the entrenchment order in terms of single contractions or revisions). It measures ranks on a ratio scale, entailing an interesting problem of 'interpersonal rank comparison' (which, by the way, explains the vagueness of the notion of belief).

So, to resume: Probability theory is no theory of belief at all, and AGM belief revision theory is an incomplete one. Reason enough to propose another one.

SB: While ranking theory comes with a notion of a degree of belief, this notion is derived from the more basic concept of a (negative) rank, which is a degree of disbelief. What were your motivations for choosing disbelief to be the basic notion? Was this for formal reasons only, or do you think there is something philosophically significant to taking degrees of disbelief to be basic?

WS: The negative terms are quite common. For instance, you often find the characterization of belief as the exclusion of possibilities; that is, you disbelieve in the excluded possibilities. Likewise, I always understood the AGM entrenchment in terms of disbelief. And if you generalize this understanding of entrenchment to a grading, you have what I call a negative ranking function. It was crucial that I started this way, because only thereby could I discover the far-reaching analogy to probability theory, which does not hold in terms of positive ranking functions (directly expressing belief). Because of this analogy I still advise everybody to start with disbelief.

This is of strategic importance. But I don't see any deeper philosophical significance. Talk of belief and disbelief is trivially interchangeable; there is no conceptual priority.

SB: As do most other theories of rational belief change, ranking theory presupposes a highly idealized agent. How far can such a theory provide a normative account of how a real agent should reason? What is your general stance towards idealizations in theorizing?

WS: This is a big issue, but the start seems simple. Norms tell how things should be and how agents should act. Normative discussions have their own rules, appealing to intuitions, to systematizations, to arguments from apparently unassailable normative premises, etc. In my case, I say how rational epistemic states should be, and the basic assumption of ranking theory is just that you do not have contradictory beliefs conditional on any entertainable assumption. Ranking theory does not tell how you should reason, understood as an active mental process. Indeed, I argue that there are no norms of reasoning in this sense; there are only norms for the results of reasoning. I often use this example: There is no norm how you should calculate 23×29. The only norm is that you should end up with 667. Ranking theory provides rich algorithms for calculating and updating ranks. This is useful for computer scientists, but it does not say that you should rationally proceed according to these algorithms.

In general, idealizations are admissible and useful; of course, it depends on the details. As to normative theories, they have the double function of serving at the same time as idealized empirical theories, simply because we tend to be norm-abiding animals; we tend to be ideal. This idealization is unfortunately often much worse than we thought, but it is unavoidable—simply because we want to understand ourselves as norm-abiding animals, be it norms of rationality, of morality, or whatever (though not norms actually imposed by some ruler, but norms we could accept in that normative discussion). Any theorizing not proceeding from this idealization cannot deliver this self-understanding. I believe that this remark has tremendous methodological consequences for the human sciences.

SB: Ranking theory is not only a theory os rational belief change, it comes with a large range of philosophical applications. One of the most important of these applications is the problem of induction. Can you explain how rational belief change relates to the problem of induction and to what extent ranking theory provides a solution to this problem?

WS: I see in the end you want me to repeat the entire book. Well, very roughly, the induction problem is how to rationally induce our world picture from all the data we have. And the revision problem is how to revise your present world picture (= set of beliefs), whatever it is, upon the reception of a new datum. Stating it in this way may already suggest that the two problems are the same. The difference is that the induction problem looks like a static problem of inference (of unfolding and justifying your present belief state), whereas the revision problem is a dynamic problem about how to change beliefs. And the dynamic perspective is simply the more fruitful one. Insofar as ranking theory states complete rules of belief change, it completely answers the revision problem.

However, all revisions must have started from some a priori state, and where the revisions end up crucially depends on that state. So, one might say that the induction and the revision problem include the question of where to start from. Apriority certainly is a difficult notion. In chapter 17 I try to argue for some rationality postulates for the

a priori states from which learning proceeds. This investigation is as fascinating as insecure.

SB: Apart from the problem of induction, what do you consider to be the most important applications of ranking theory? In your opinion, to whom outside the formal epistemology community would ranking theory be most interesting?

WS: I find all the applications of ranking theory in my book important. My novel view of deterministic laws is (perhaps too) provocative. Unifying the theory of causation by developing a theory of deterministic causation which is similar to, and equally sophisticated as, theories of probabilistic causation is really important. Shedding new light on ill-understood ceteris paribus laws and on dispositions should be useful. And so on.

Moreover, I would wish that traditional epistemologists took notice of ranking theory and of chapter 16 in particular. There is a very unhappy division of epistemology into a theory of knowledge (often called traditional) and a theory of belief (often formal). Bayesianism deepened this division, because it has no notion of belief and hence can't say anything about knowledge. I feel that ranking theory has the potential of overcoming this division. But it can do so only if it is studied on both sides of the division.

SB: Many of the applications of ranking theory address questions from the philosophy of science. What is the relation between rational belief change and philosophy of science in your view?

WS: Oh, it was philosophy of science that raised the issue of belief change in the first place (in our modern times). That is, we first had the discussion about theory change, as initiated by Kuhn in 1962, with many instructive contributions, but also with the insight that foundational studies shouldn't start with such complicated things as scientific theories, but with such simple beliefs as to whether it will rain tomorrow. This is why investigations turned to the logical structure of theory or belief change in the 70's. Neither belief revision nor ranking theory has returned to the Kuhnian topics. But, as I have explained, the dynamic issues are hidden everywhere in philosophy of science, just as conditional belief is about the most basic epistemological phenomenon (ubiquitously implicit in ordinary language). So, everybody is advised to make this explicit.

SB: Are there any topics that you would have liked to address within the book that did not make it in?

WS: All chapters could be further developed; and many open issues are stated there. This amounts to a huge research agenda. Several topics are not well-handled or are multiply addressed without systematic treatment. So, I did not manage to keep all threads together. Qualitative decision theory in terms of ranking theory is treated step-motherly. I say a lot about justification and belief, but do not address knowledge explicitly, clearly a gap. I found the topic of conditionals so messy that I didn't dare to tackle it explicitly. However, I claim that ranking theory has the same applications and deals with them more successfully. The explanation must be that ranking theory successfully deals with conditionals themselves. I am about to redeem that explanation. Wherever you use conditional logic, you should better use ranking theory. And so on.

SB: Now that this book is finished, what are your plans for the future? Are you already working on a new project?

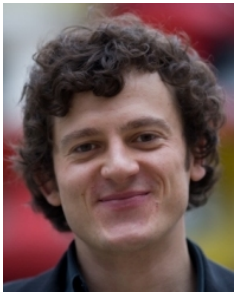
WS: Dynamics is important everywhere. I have various ideas about dynamic rational

choice, which I would like to elaborate under the heading "reflexive decision theory". This is my present project. I hope it does not take as long as the book on ranking theory. There are still other important projects on my desk, which I urgently wish to address as well. Life's too short for striding across the riches of philosophy.

Belief First

I want to defend the thesis that, to the extent that epistemology is a normative discipline, the principle that Ought Implies Can implies that epistemology studies what ideal agents should believe, and how ideal agents should revise their beliefs when they receive new information. To the extent that epistemology is a normative discipline, the principle that Ought Implies Can implies that epistemology does not study what ideal agents should know.

The agents I am considering are *ideal* in the sense that they do not suffer from any computational or other physical limitations and always believe all logical and conceptual truths. The ideal agents also get to decide voluntarily what they believe, and they never forget any of their beliefs. For such ideal agents the principle that Ought Implies Can imposes no constraint on what they should or ought to believe. Indeed, I am inclined to define an agent to be ideal just in case she can carry out any action that is physically possible. In other words, an agent is ideal just in case any action that is physically possible is an action that is possible for her. Such ideal agents ought to do exactly that which they ought to do if they could, where the 'can' in 'could' expresses possibility for the agent, not metaphysical possibility. The restriction to actions that are physically possible is important. My reason for choosing physical possibility rather than, say, metaphysical possibility, is the following. What is possible for an agent is subject to change due to technological and other developments. I take physical possibility to be the "least upper bound", the narrowest modal boundary, for these developments. Physically possible actions that are presently impossible for real agents such as people or computer programs may become possible for those agents at some point in the future. Physically impossible actions will never become possible for those agents.



My thesis is that, to the extent that epistemology is a normative discipline, the principle that Ought Implies Can implies that epistemology studies what ideal agents should do *qua* believers. What ideal agents should do *qua* believers is to hold certain beliefs, and to refrain from holding other beliefs, and to revise their beliefs in certain ways. (Or perhaps they should hold certain beliefs to certain degrees, and revise their degrees of belief in certain ways. The distinction, and relation, between belief and degree of belief does not matter for present purposes.) What ideal agents should do *qua* believers depends on their cognitive goals, which may or may not be transparent to them. Cognitive goals may figure as a condition in the ideal agent's conditional obligations to believe, as in the conditional obligation that Sophia should believe that Vienna is the capital of Austria given that she has the cognitive goal of holding a belief that is true and suffi-

ciently informative to answer the question whether Vienna is the capital of Austria. To the extent that epistemology is a normative discipline, the principle that Ought Implies Can implies that epistemology does not study what ideal agents should do *qua* knowers, unless that is studying what ideal agents should do *qua* believers (the sense in which an expert ought to have known better, or a child should not have known, are cases where what may seem to be obligations to know really are obligations to do something else: the expert should have gathered more information, and the child should not have had access to certain information). The reason is that knowledge, in contrast to belief (and degree of belief), is not an internal affair (Williamson, T. 2000: *Knowledge and Its Limits*, OUP).

Beliefs may also contain an external element in that certain beliefs may be caused by experience. However, how to revise one's other beliefs once those experientially caused beliefs are held is a purely internal affair. We can only require agents to do things that are within their reach, or else we violate the principle that Ought Implies Can. Internal affairs such as beliefs are within the ideal agents' reach, even if the ideal agents' cognitive goals are not transparent to them. Non-internal affairs such as knowledge are not.

For instance, we can require Sophia to look if it is raining, and to listen if the TV is on, and to taste whether the pasta is ready. We can also require her to form a belief about whether Vienna is the capital of Austria. However, we cannot require her to see that it is raining, or to hear that the TV is on, or to taste that the pasta is ready. Nor can we require her to know that Vienna is the capital of Austria. Indeed, we cannot even require her to "truly-believe" that Vienna is the capital of Austria. Here to require her to truly-believe is to require her to believe, which we can, but also to bring it about that the belief is true, which we cannot.

Like their cognitive goals their knowledge may figure as a condition in the ideal agents' conditional obligations to believe, as in the conditional obligations that Sophia should believe that Athens is the capital of Greece given she knows that it is, and that Sophia should not believe that London is the capital of England given that she does not know it is. However, knowledge may not figure in the consequent of a conditional obligation, or in an unconditional obligation: we cannot require Sophia to know that Athens is the capital of Greece, unconditionally or conditional on the assumption that she believes that it is; nor can we require Sophia to not know that London is the capital of England, unconditionally or conditional on the assumption that she does not believe it is. We cannot require Sophia do so, because it is not within Sophia's reach to bring about the external facts that have to obtain in order for her to know, and in order for her to not know.

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Fraud in academic medical research: Lessons from Flanders, Belgium

A scientific survey on fraud in academic medical research in Flanders, of which the results were recently published in popular science magazine *Eos*, has caused tumult in the Flemish academic community. The reason is that these results suggest that scientific fraud (which could indirectly cause ill health and death among patients) is not as rare as earlier estimates indicate. Malpractices are primarily attributed to the pressure to publish. In this piece, we elaborate on the content of the study and pave the way for reform.

In its April 2013 issue, *Eos*, a Belgian popular science magazine, published the results of an anonymous survey on fraud at all medical university faculties in Flanders, Belgium. The study delivers some figures that are remarkably higher than earlier estimates of scientific misconduct (Martinson BC, Anderson MS, de Vries R 2005: Scientists behaving badly, *Nature* 435:737–738; Fanelli D 2009: How many scientists fabricate and falsify research? A systematic review and meta-analysis of survey data, *PLoS ONE* 4:e5738; Gardner W, Lidz CW, Hartwig KC 2005: Authors' reports about research integrity problems in clinical trials, *Contemporary Clinical Trials* 26:244–251). Of the 315 researchers that completely filled out the questionnaire, four admitted that they had fabricated data in the past three years (1.3%). 23 researchers said they had deleted certain data in order to have an hypothesis confirmed by the data (7.3%). Other questionable research practices that the respondents engaged in are: dropping data that were intuitively incorrect (27%), accepting other researchers' poor data (20%), and adding authors who did not make any contribution (69%). 47% reported knowing about a colleague who made up or selectively removed data. The respondents attribute the malpractices to the current 'publish or perish' culture at the university: 64.4% thinks publication pressure causes colleagues to change data, and 52.4% thinks it makes science 'sick' (Verbeke R 2013: Wetenschapsfraude: De harde cijfers, *Eos* April 2013:24–28). These results suggest that the increasing pressure to publish in the academic world, not only in Belgium but in other countries as well, becomes a serious threat to scientific integrity.

Although it is, at this point, difficult to assess the quality of the study (*Eos*-journalist Reinout Verbeke and researcher Joeri Tijdink of the VUmc Amsterdam are currently preparing a scientific article on it), we can already reflect on its implications with respect to (medical) science policy.

As a response to the survey results, Peter Marynen, Vice Rector for Research Policy at KU Leuven, mentioned that all Flemish universities have specialized commissions for the protection of scientific integrity (Het Journaal, Heel wat wetenschappers sjoemelden al eens met resultaten, deredactie.be, March 20, 2013). These commissions mainly depend on whistleblowers, who report their colleagues' misconduct. The results of the *Eos*-survey indicate that such a system is not very effective. Furthermore, Marynen mentions the importance of educating Masters students and Ph.D. students about methods to be used in scientific research (*ibid.*). Whether adequate education is sufficient to prevent the malpractices identified in the *Eos*-survey is, however, questionable, since

these practices are attributed to the pressure to publish, rather than to ignorance on how to conduct research responsibly. Scientists may know that forging data is irresponsible, but they do it anyway, in order to produce high-impact publications.

Universities can make policies to protect scientific integrity more effective by strengthening their capacity to detect offenders. One proposal, mentioned by Nicholas H. Steneck, Director of the Research Ethics and Integrity Program of the Michigan Institute for Clinical and Health Research, is to supplement education on the responsible conduct of research with data audits that check whether guidelines are actually being followed (Steneck NH 2002: Assessing the integrity of publicly funded research, in Steneck NH, Scheetz MD, eds, *Investigating research integrity: Proceedings of the First ORI Research Conference on Research Integrity* 1–16). As this would increase the probability of being caught, scientists will be less inclined to misbehave. But data audits could be expensive. Other strategies to prevent scientific fraud may therefore be more cost-effective. One such strategy is to remove the alleged cause of scientific fraud, i.e., publication pressure.

Publication pressure is not unique to academic life in Flanders. It is a global phenomenon (Leung K 2007: The glory and tyranny of citation impact: An East Asian perspective, *Acad Manage J.* 50:510–513), and it may increase wherever competition for academic positions increases (since this may make a lot of publications in high-impact journals increasingly mandatory to qualify for such a position). Therefore, the relation between publication pressure and scientific fraud should be taken into account not only in Belgium, but in other countries as well. What would be the main lesson, then?

Counting publications and comparing impact factors is easy, but unfortunately, it is not a good basis for decisions on research funding, promotion, or tenure. When career opportunities depend too heavily on number of publications and journal impact factors, then this is a serious threat to the integrity of research. An important challenge for the academic community is then to find other, more adequate criteria for making decisions on research funding, promotion, and tenure. These criteria should of course be reliable and practicable indicators of the quality of the researcher and his/her work. But it is also important that using them in the decisions under consideration does not stimulate scientific fraud. Instead, it should motivate scientists to perform the most valuable research with the highest degree of integrity. As long as such criteria are not implemented, we cannot rely on academic research as the more trustworthy counterpart of industry research.

Jan De Winter
Laszlo Kosolosky
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Emergence of Consciousness, 9 May

The Society for the Study of Artificial Intelligence and the Simulation of Behaviour (AISB) is a learned society for AI, Cognitive Science and related fields. A series of member workshops is being organised to promote sharing and discussion of current work in areas of interest. The first two workshops addressed Sensorimotor Theory and Distributed Thinking respectively, and further events are in the pipeline.

The third AISB workshop, organised jointly with the Centre for Bioethics and Emerging Technologies (CBET) at St Mary's University College, set out to examine current understanding of consciousness: what is it, and is it unique to humans? Did it emerge, and if so how, when and why? Is there a continuum between consciousness and non-consciousness, and is there something special about self-consciousness?

The first keynote speakers addressed questions of consciousness in animals and machines. Murray Shanahan presented the concept of Global Workspace Architecture, and showed how the wiring of many animal brains appears to fit this structure, raising the probability that machines endowed with equivalent 'brains' would become conscious. Steve Torrance pursued the concept of 'superintelligent' machines, that could arise as machines recursively create new machines a little more intelligent than themselves—and the likely concomitance of 'superconsciousness'. Are we working towards a race of electronic beings who will eventually afford us the same ethical and moral consideration we currently give to the higher animals?

Our second pair of keynote speakers considered what cognitive archaeology and palaeoanthropology can contribute to the debate. James Steele presented studies on the development of human physiology as compared with early hominids and extant ape species, What might this tell us about the emergence of language and—perhaps—consciousness? Geoffrey Hunt offered a critique of MJ Rossano's 'Archaeology of Consciousness', which proposes that the development of hand-axe technology is evidence of developing consciousness. Speakers and audience alike look forward to further co-operation in these areas.

In the general sessions, we heard from researchers at all levels from MSc student to established professor, offering empirical and theoretical research, and one speculative position paper on the role of time and 'runningness' in consciousness. The question of emergence was addressed from a range of perspectives, including when and why the concept of consciousness arose in scientific thought. Questions were raised on physicalism and substance dualism; and an alternative duality of abstract vs concrete was proposed, with the intriguing concept of 'panabstractism'. Developments were presented on Dennett's intentional stance in the light of contextual emergence, and on Davidson's account of the role of language in rationality, as well as what enactivism has to say about Mary, bats and zombies. Some 'relatively neglected' writings of Locke were reviewed in light of their use by subsequent research. The final session focussed on social aspects of consciousness, including aspects of agency and community, how self-awareness is

mediated by other minds, and an evolutionary approach to morality and ethics.

Janet Gibbs
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Putnam's Model-Theoretic Arguments, 23 May

In his papers "Realism and Reason" (1977) and "Models and Reality" (1980) as well as in his book *Reason, Truth and History* (1981), Putnam launched his attack on (metaphysical) realism. Using tools from model theory, he aimed to show that the total use of our language (theoretical plus operational constraints) cannot determine a unique intended interpretation. On May 23, the Munich Center for Mathematical Philosophy (MCMP) hosted a one day workshop on Putnam's model-theoretic arguments (MTAs) organized by Georg Schiemer (MCMP, LMU Munich) and Julien Murzi (MCMP, Kent).

The workshop started with a talk by Tim Button (Cambridge). He argued that the MTAs arise from adhering to a faulty philosophy of perception, viz., that the world is hidden behind a veil of sensations. Thus, in invoking causation as a means to fix reference, we might equally well appeal to magic. Button then argued that the MTAs provide a means to turn Cartesian scepticism into (incoherent) Kantian scepticism. Finally, he argued that Putnam's own direct realism (as laid down in "The Threefold Cord") is insufficient to prevent Cartesian scepticism from arising. Tim Button discusses this in detail in his forthcoming book *The Limits of Realism*.

Kate Hodesdon (Bristol) linked the MTAs to the so-called Newman objection to structural realism. She pointed out that epistemic structural realism and metaphysical realism both share the view that there are epistemically inaccessible things. This assumption is rejected by ontic structural realism and Putnam's internal realism, thus blocking the model theoretic machinery.

Igor Douven (Groningen) first brought into focus the thesis that semantics is an empirical science, which he regards as one of the main premises that Putnam ascribes to the metaphysical realist. He then argued that if semantics is conceived of as a science which is not susceptible to physicalist reduction, then the MTAs might not work. However, from this it doesn't follow that reference is not indeterminate. In the last part of his talk, Igor presented recent results in cognitive semantics that suggest the possibility that reference is indeed indeterminate.

Finally, Timothy Bays (Notre Dame) reassessed his earlier view on the MTAs as applied to set-theory. While all of his older papers basically concluded that the MTAs don't work, he now thinks that some versions of it actually might work. However, he argued that there is a trade-off between making the MTAs work and making the MTAs philosophically interesting. Thus, in cases where the MTAs work, the conclusion is neither surprising nor troublesome, and in those cases were they want to establish a perplexing result they just don't work.

Videos of all talks are available on the iTunesU site of the MCMP.

Thomas Schindler
MCMP, LMU Munich

Truth and Paradox, 24–25 May

Tarski's theorem shows us that if a language contains its own truth-predicate then either some instances of the T-schema, $\phi \leftrightarrow T\ulcorner\phi\urcorner$, must fail, or the logic cannot be classical. "Revisionary" approaches argue that the T-schema should be kept, but some classically valid structural inference rules should be rejected. Alternatively, "axiomatic" and "semantic" approaches argue that certain instances of the T-schema should be rejected. The axiomatic and semantic approaches differ by how they specify the theory of truth. The Truth and Paradox workshop organized by Julien Murzi (Kent, Munich) and Ole Hjortland (Munich) in Munich brought together researchers working on revisionary, semantic and axiomatic theories of truth.

The workshop started with a talk by Francesco Paoli (Cagliari) who investigated how non-classical Ripley's ST is. Building on work on abstract consequence relations by Blok-Jonsson, he distinguished internal from external consequence and argued that Ripley's external consequence relation is highly non-classical.

Christine Schurz (Salzburg) presented an alternative to the standard way of modeling reasoning about the strengthened liar, $\lambda \leftrightarrow \neg T\ulcorner\lambda\urcorner$, within contextual-hierarchical approaches.

Extending work by Halbach and Welch, Johannes Stern (Munich) presented a proof-theoretic reduction of a theory with a modal predicate to a theory with a modal operator and a truth predicate, where "$\ulcorner\phi\urcorner$ is necessary" is translated to "necessarily, $\ulcorner\phi\urcorner$ is true".

To provide a philosophical interpretation of what it is to reject structural contraction, Lionel Shapiro (Connecticut) argued for a naive approach, where the turnstile is a metalanguage predicate substituting for implication of the object language.

The second day of the workshop began with Dave Ripley (Melbourne), who argued that closing non-contractive logics under contraction leads to interesting non-transitive logics that may govern particular phenomena.

Thomas Schindler (Munich) presented a disquotational theory of truth which is obtained by restricting the T-biconditionals to formulae "not obtained by diagonalization". The resulting theory is as strong as Z_2^- and is ω-consistent.

Martin Fisher (Munich) argued that a good criterion for the increase in expressive power of theories of truth is their ability to provide shorter proofs. Theories may satisfy this criteria while remaining conservative over Peano Arithmetic, thereby allowing for theories the desiderata of a deflationary theory of truth, namely to be both expressive and non-substantial.

The conference finished with Elia Zardini (Aberdeen) who argued that whenever one remains non-substructural and retains the unrestricted T-biconditionals then one cannot interpret bounded quantifiers as $\forall x(\phi(x) \rightarrow \psi(x))$ whilst allowing rules that we would expect to govern bounded quantification.

Videos of all talks are available on the iTunesU site of the MCMP.

Catrin Campbell-Moore
Thomas Schindler
MCMP, LMU Munich

Formal Epistemology Festival, 2–5 June

The Formal Epistemology Festival, which started in 2008, had its fifth and final event in Toronto. Rachael Briggs (ANU), Kenny Easwaran (USC), Jonathan Weisberg (Toronto) and Franz Huber (Konstanz/Toronto) organised the festive meeting including twelve talks.

As one would expect, attention was given to questions on probabilities. Ronnie Hermens (Groningen) discussed whether conditional probability can equal the probability of a conditional. He came to the conclusion that this is possible if one evaluates the conditionals with respect to a context. Kenny Easwaran extended the definition of expected utility in order to evaluate a class of infinite gambles, like the Pasadena game, by using truncations.

Decision theory was one of the main topics. Some of the contributions focused on the epistemic side of decision making. Rohan Sud (Michigan, Ann Arbor), for example, analysed Elga's decision theoretic argument against imprecise credences. Hanti Lin (Carnegie Mellon University/ANU) argued in favour of a decision theoretic framework based on plain belief instead of subjective probability. Decision theory was also discussed from the side of the agent's non-epistemic characteristics. Most notably, Lara Buchak (Berkley) presented her risk functions in order to capture risk-sensitive decision making. This subject was taken up again by Zachary C. Irving (Toronto) who investigated Buchak's risk functions from a psychological perspective.

Another focus of the discussion was rationality. In his talk on time slice rationality, Brian Hedden (MIT/Oxford) argued that an agent has no stronger obligation to be in line with his past and future selves than with other persons. Real agents are often not coherent and so Julia Staffel (USC) asked whether such agents should pretend they are perfect. She argued that incoherent agents cannot minimize their incoherence by evaluating new propositions probabilistically coherent with respect to at least some of their previous beliefs. The fact that agents might not know exact probabilities was the background of Jonah Schupbach's (University of Utah) talk. He presented inference to the best explanation as a heuristic rule that is almost as reliable as Bayesian reasoning.

Though formal epistemology differentiates itself thematically from mainstream epistemology, the event included much discussion of traditional subjects of epistemology and philosophy in general. Anna-Sara Malmgren (Stanford) examined inferential justification. Justification was also the subject of Jennifer Nagel's (Toronto) talk, which focused on the collection of evidence and the effort this takes. Carolina Sartorio (Arizona) appealed to causal relationships between reasons and actions to give a compatibilist account of free will. To sum up, the festival provided insight into recent debates in formal epistemology but also on the broader context of forming beliefs and acting upon these beliefs.

Corina Strössner
University of Konstanz

Calls for Papers

Infinite Regress: special issue of *Synthese*, deadline 1 July.

The Life and Work of Leon Henkin: Mara Manzano, Ildiko Sain and Enrique Alonso eds, deadline 1 September.

What's Hot in ...

Logic and Rational Interaction

The name "deontic logic" refers to a class of logical models developed for reasoning about obligations of all kinds. Compared to other philosophical fields, deontic contexts turned out to be highly refractory to satisfactory formalization. For instance, the wish to have conditional obligations such as: "You ought not kill; but if you kill you ought to do it gently" prohibits the use of well behaved (normal, unary) operators known from epistemic logic. Current debates in deontic logic are still highly centered around the choice of the right framework for avoiding certain paradoxes. While temporal arguments are prominent in epistemic contexts, they have been mainly ignored in deontic considerations so far. Some recent publications change this, as we shall see.

Davide Grossi, Johan van Benthem and Fenrong Liu apply some instruments from the dynamic logic toolbox to deontic reasoning. Following the seminal approach of Hanson, the underlying tool for representing obligations is a betterness relation on a set of possible worlds. A conditional obligation for some φ given some ψ then means that φ holds in the best ψ worlds. Interestingly, this is equivalent to giving a betterness relation on some ordered set of formulae and declaring a world to be better than another if better formulae hold at the first world. This kind of orderings between worlds is well known from doxastic logic, where the orderings represent plausibility of belief states. The authors show that two operators developed for tracking belief changes—public announcement and the strong revision—are useful for reasoning about the changes of deontic situations. While the public announcement operator can track the change of obligations under learning facts about the world, it can also be used to identify all conditional obligations whose conditions are true at the actual world. The revision operator on the other hand can be used to incorporate new normative requirements into the betterness order.

Expansions and Contractions of the normative basis also feature prominently in studying legal norms. A legal code isn't static, but norms are constantly added and removed or abrogated. The usual way in which an abrogation works is that the particular norm does not apply to any future instances, though it does apply to all events that happened before the time of abrogation. There is a second kind of legal norm change, exercised for instance by constitutional courts: annulling a norm, that is retroactively declaring it invalid. The difference between these two is subtle: in judging some event that took place at some time t a court can refer to norms that were in force at t but were abrogated in the meantime. It cannot make use of any norms that were in force at t but were annulled later, as anullment works retroactively. In their current paper Guido Governatori

and Antonino Rotolo present a temporal-logical framework that is fine grained enough to model the distinction between abrogation and anullment. Their framework contains time-stamps for the various moments relevant, that is for the times of action, norm-introduction and judgment. Their framework also incorporates a second aspect of legal reasoning, the distinction between strict and defeasible inferences, as well as allowing for representation of defeaters.

In a third paper, Olivier Roy, Albert Anglberger and Norbert Gratzl pursue a different interesting approach: The intuition behind their model is that not obligations but permissions are the primitive objects of deontic reasoning. In their approach an actor ought to do some φ just in case every act the actor is permitted to do is a φ-act, that is the actor has no permitted way of avoiding φ. The authors present an interesting non-normal modal logic formalizing this intuition. They show that their logic satisfies various desiderata that came up in the course of debate about deontic logics.

LORIweb is always happy to publish information on topics relevant to the area of Logic and Rational Interaction—including announcements about new publications and recent or upcoming events. Please submit such news items to Rasmus Rendsvig, our web manager or to the loriweb address.

Dominik Klein
TiLPS, Tilburg University

Uncertain Reasoning

On 14 May 2013 actress Angelina Jolie wrote in The New York Times that she carries a harmful mutation in the BRCA1 gene. According to her counsellors this contributes to giving her a 87% lifetime risk of developing breast cancer. As a result, she decided to undergo bilateral prophylactic mastectomy. In her NYT piece titled "My Medical Choice" she explains—in the hope "that other women can benefit from my experience"– how she "decided to be proactive and to minimize the risk" as much as possible. The preventive surgery now leaves her with a 5% probability of developing breast cancer, half the "average" risk. She is also considering hysterectomy, for her faulty BCRA1 is considered to push her risk of developing ovarian cancer, to which she lost her mother aged 56, up to 50%. Further details of her risk-management strategy are provided by one of Jolie's doctors.

The interest in the actress's analysis of her own decision-making goes well beyond uncertain reasoning. Indeed, Jolie's piece attracted immediate global and intersectoral attention. This owes partly to her celebrity status and partly to the multifaceted set of questions raised by her decision and its public disclosure. Worries of ethical, epistemological, financial and economic kinds are intertwined across the vast number of commentaries which are already available on the case.

What appears to be the most pressing issue has to do with the impact Jolie's story is likely to have on BRCA screening, which is commercially available, albeit very controversially so. As of June 2013 the company Myriad Genetics holds the right to patent the BRCA test, a right which is currently being challenged in the Supreme Court. Conflicts of interests aside, BRCA testing carries enormous personal risks, as is clearly detailed in US National Cancer Institute factsheet on BRCA1 and BRCA2: Cancer Risk and Genetic Testing:

> The direct medical risks, or harms, of genetic testing are very small, but test results may have an effect on a person's emotions, social relationships, finances, and medical choices. People who receive a positive test result may feel anxious, depressed, or angry. They may choose to undergo preventive measures, such as prophylactic surgery, that have serious long-term implications and whose effectiveness is uncertain. People who receive a negative test result may experience "survivor guilt," caused by the knowledge that they likely do not have an increased risk of developing a disease that affects one or more loved ones.

The UK National Health Service warns people with a family history of breast cancer that the decision whether or not to take a genetic test should be accompanied by genetic counselling especially aimed at helping patients figure out how they will cope with the results. Even if genetic screening were completely accurate, the consequences of losing one's ignorance about one's own genetic make-up may be enormously distressing. However, such a complete accuracy seems to be yet to come. The NHS's Genetic testing—a

guide for people with a family history of breast cancer warns in fact that

> the results of some genetic tests are inconclusive because we don't know what effect a particular gene fault may have on breast cancer risk.

It is apparent that Jolie's case, not the first of its kind but surely the most sensational to-date, is likely to trigger a major public and scientific debate on the issue of genetic screening and preventive surgery. Perhaps a debate reminiscent of the mid-eighteenth century dispute on the inoculation of smallpox. Back in the 1760s Daniel Bernoulli modelled mathematically the hard-to-measure expected individual benefits of vaccination, arguing it was rational to undergo such a prophylactic treatment. Against this, D'Alembert held up the view that good sense should prevail over dubious quantifications of uncertainty, i.e., the misuse of probability, in matters of central public interest. In hindsight, both contenders were right about *some* aspect of the problem. Indeed, 250 years on, we can fully appreciate the fundamental role for the wider field of uncertain reasoning played the Bernoulli-D'Alembert controversy (see, e.g., chapter 4 of Nicolas Bacaer 2011: *A Short History of Mathematical Population Dynamics*, Springer).

Finally, I'd like to mention a coincidence. On 5 June 2013 Paul B. Farrell warned on Market Watch that there is currently a 87% risk of financial doomsday by the end of 2013. It is the same figure that Jolie's experts fed into her decision tree. I leave it to the readers of The Reasoner to speculate on the comparison between Jolie's attitude towards risk and that of the Big Guys who run global finance.

Hykel Hosni
Scuola Normale Superiore, Pisa
CPNSS, LSE

Events

July

Unconceived Alternatives and Scientific Realism: Durham University, 1–2 July.
LMiAP: 7th Latin Meeting in Analytic Philosophy, Institut Jean Nicod, Paris, 1–2 July.

CaEitS
Causality and Experimentation in the Sciences
Paris, 1–3 July

CEPE: Ambiguous Technologies: Philosophical Issues, Practical Solutions, Human Nature, Lisbon, Portugal, 1–3 July.
SIROCCO: 20th International Colloquium on Structural Information and Communication Complexity, Ischia, Italy, 1–3 July.
Influences on the Aufbau: MCMP, Munich, 1–3 July.
CiE: The Nature of Computation, Milan, Italy, 1–5 July.

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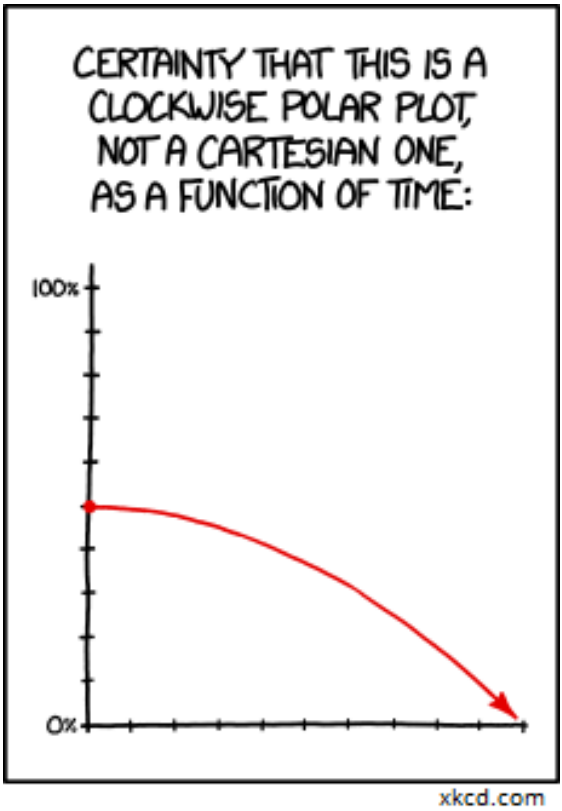
ISIPTA: 8th International Symposium on Imprecise Probability: Theories and Applications, Compiegne, France, 2–5 July.
IC-EpsMsO: 5th International Conference on Experiments/Process/System Modeling/Simulation/Optimization, Athens, Greece, 3–6 July.
YSM: Young Statisticians' Meeting, Imperial College London, 4–5 July.
Carnap on Logic: MCMP, Munich, 4–6 July.
ECSQARU: 12th European Conference on Symbolic and Quantitative Approaches to Reasoning with Uncertainty, Utrecht University, The Netherlands, 7–10 July.
AAP: Australasian Association of Philosophy Conference, University of Queensland, 7–12 July.
GDRR: 3rd Symposium on Games and Decisions in Reliability and Risk, County Cork,



Ireland, 8–10 July.
CCA: Computability and Complexity in Analysis, Nancy, France, 8–10 July.
ICALP: 40th International Colloquium on Automata, Languages and Programming, Riga, Latvia, 8–12 July.
Scepticism: New Perspectives on External World Scepticism, MCMP, LMU Munich, 9–10 July.

What Can Category Theory Do For Philosophy?

University of Kent, Canterbury, 9–11 July

Gödel: From Logic to Cosmology, Aix-en-Provence, 11–13 July.
IUKM: 3rd International Symposium on Integrated Uncertainty in Knowledge Modelling and Decision Making, Beijing, China, 12–14 July.
AAAI: 27th AAAI Conference on Artificial Intelligence, Bellevue, Washington, USA, 14–18 July.

StaRAI: 3rd Workshop on Statistical Relational Artificial Intelligence, Bellevue, Washington, USA, 15 July.
ACSL: Workshop on Approaches to Causal Structure Learning, Bellevue, WA, USA, 15 July.
EetN: Formal Methods in Philosophy, Gdańsk, Poland, 15–17 July.
IACAP: Annual Meeting of the International Association for Computing and Philosophy, University of Maryland at College Park, 15–17 July.
PLS: 9th Panhellenic Logic Symposium, National Technical University of Athens, Greece, 15–19 July.
AI4FM: 4th International Workshop on the use of AI in Formal Methods, Rennes, France, 22 July.
DMIN: International Conference on Data Mining, Las Vegas, USA, 22–25 July.
LC2013: Logic Colloquium, Évora, Portugal, 22–27 July.
FoP: Foundations of Physics, LMU, Munich, 29–31 July.
Uncertainty Handling: Practical and Theoretical Concerns on Uncertainty Handling in AGI, Beijing, China, 31 July.
AGI: 6th Conference on Artificial General Intelligence, Beijing, China, 31 July–3 August.

August

AIBD: 1st Workshop on Artificial Intelligence for Big Data, Beijing, China, 3–4 August.
ITDAS: International Workshop on Information and Trust Dynamics in Artificial Societies, Beijing, China, 3–5 August.
WL4AI: Weighted Logics for AI workshop, Beijing, China, 3–5 August.
GKR: Graph Structures for Knowledge Representation and Reasoning, Beijing, China, 3–5 August.
NRAC: 10th International Workshop on Nonmonotonic Reasoning, Action and Change, Beijing, China, 3–5 August.
TAFA: 2nd International Workshop on Theory and Applications of Formal Argumentation, Beijing, China, 3–5 August.
IJCAI: 23rd International Joint Conference on Artificial Intelligence, Beijing, China, 3–9 August.
WCP: 23rd World Congress of Philosophy, Athens, Greece, 4–10 August.
BLAST: Chapman University, Southern California, 5–9 August.
KSEM: International Conference on Knowledge Science, Engineering and Management, Dalian, China, 10–12 August.
MLG: 11th Workshop on Mining and Learning with Graphs, Chicago, 11 August.
LMoGDM: Logical Models of Group Decision Making, Düsseldorf, Germany, 12–16 August.
WoLLIC: 20th Workshop on Logic, Language, Information and Computation, Darmstadt, Germany, 20–23 August.
Prior: Arthur Prior Centenary Conference, Oxford, 21–22 August.
RACR: 4th International Conference on Risk Analysis and Crisis Response, Istanbul, Turkey, 27–29 August.

EPSA: European Philosophy of Science Association, University of Helsinki, Finland, 28–31 August.
EoM: Epistemology of Modality, University of Lisbon, 29–31 August.

September

ICSCCW: 7th International Conference on Soft Computing, Computing with Words and Perceptions in System Analysis, Decision and Control, Izmir, Turkey, 2–3 September.
LSFA: 8th Workshop on Logical and Semantic Frameworks with Applications, Sao Paulo, Brazil, 2–3 September.
DIAL: Dialectic in Aristotle's Logic, Groningen, Netherlands, 2–4 September.
CSL: 22nd EACSL Annual Conference on Computer Science Logic, Turin, Italy, 2–5 September.
ECAL: 12th European Conference on Artificial Life, Taormina, Italy, 2–6 September.
ENPOSS: European Network for the Philosophy of the Social Sciences and the Philosophy of Social Science, University of Venice Ca' Foscari, 3–4 September.
MANY-VAL: Games, Decisions, and Rationality, Prague, Czech Republic, 4–6 September.
WPMSIIP: 6th Workshop on Principles and Methods of Statistical Inference with Interval Probability, Switzerland, 5–10 September.
MCU: Machines, Computations and Universality, University of Zurich, 9–12 September.
ITA: 5th International Conference on Internet Technologies and Applications, Glyndwr University, Wrexham, North Wales, UK, 10–13 September.
HAIS: 8th International Conference on Hybrid Artificial Intelligence Systems, Salamanca, Spain, 11–13 September.
SOCO: 8th International Conference on Soft Computing Models in Industrial and Environmental Applications, Salamanca, Spain, 11–13 September.
SEFA: Seventh Meeting of the Spanish Society for Analytic Philosophy, University Carlos III, Madrid, 11–14 September.
SOPHIA: Salzburg Conference for Young Analytic Philosophy, University of Salzburg, Austria, 12–14 September.
SMLC: Synthetic Modeling of Life and Cognition: Open Questions, Bergamo, 12–14 September.
AIGM: 3rd Workshop on Algorithmic issues for Inference in Graphical Models, Paris, 13 September.
CLIMA: 14th International Workshop on Computational Logic in Multi-Agent Systems, Corunna, Spain, 16–17 September.
SUM: 7th International Conference on Scalable Uncertainty Management, Washington DC, 16–18 September.
SIFA: Graduate Conference on Language, Logic and Mind, University of Cagliari, 16–18 September.
CLPS: International Conference on Logic and Philosophy of Science, University of Ghent, 16–18 September.

ASAI: Argentine Symposium on Artificial Intelligence, UNC, Córdoba Capital, Argentina, 16–20 September.
ALC: Asian Logic Conference, Guangzhou, 16–20 September.
KI: 36th Annual Conference on Artificial Intelligence, Koblenz, 16–20 September.
DKB: Dynamics of Knowledge and Belief, Koblenz, Germany, 16–20 September.

PROGIC

The sixth workshop on Combining Probability and Logic. Special focus: combining probability and logic to solve philosophical problems. Munich, 17–18 September

MATHEMATICAL VALUES: London, 17–19 September.
CAEPIA: 15th Conference of the Spanish Association for Artificial Intelligence, Madrid, Spain, 17–20 September.
DF& N: Doxastic Freedom and Normativity, University of Regensburg, Germany, 19–21 September.
IJCCI: 5th International Joint Conference on Computational Intelligence, Algarve, Portugal, 20–22 September.
FOTFS: History and Philosophy of Infinity, Cambridge, UK, 20–23 September.
PT-AI: Philosophy and Theory of Artificial Intelligence, Oxford, 21–22 September.
MFCA: 4th MICCAI Workshop on Mathematical Foundations of Computational Anatomy, Nagoya, Japan, 22 September.
SCALE: Scalable Decision Making: Uncertainty, Imperfection, Deliberation, Prague, Czech Republic, 23 September.
TBILLC: 10th International Tbilisi Symposium on Language, Logic and Computation, Georgia, 23–27 September.
TYPE: Type Theory, Homotopy Theory and Univalent Foundations, Barcelona, 23–27 September.
AIAI: 9th IFIP International Conference on Artificial Intelligence Applications and Innovations, Paphos, Cyprus, 30 September–2 October.

OCTOBER

APMP: 2nd International Meeting of the Association for the Philosophy of Mathematical Practice, University of Illinois at Urbana-Champaign, USA, 3–4 October.
LORI: 4th International Workshop on Logic, Rationality and Interaction, Zhejiang University, Hangzhou, China, 9–12 October.
INVESTIGATING SEMANTICS: Ruhr-University-Bochum, 10–12 October.
EXPERIMENTAL PHILOSOPHY: State University of New York, Buffalo, 11–12 October.

INDUCTIVE LOGIC AND CONFIRMATION IN SCIENCE

University of Kent, Paris Campus, 17–18 October

IDA: 12th International Symposium on Intelligent Data Analysis, London, UK, 17–19 October.
FPMW: French PhilMath Workshop, Paris, France, 17–19 October.
ICPI: International Conference on Philosophy of Information, Xian, China, 18–21 October.

LENLS: Logic and Engineering of Natural Language Semantics, Kanagawa, Japan, 27–28 October.
HaPoC: 2nd International Conference on the History and Philosophy of Computing, Paris, France, 28–31 October.

November

CHPS: 29th Boulder Conference on the History and Philosophy of Science, University of Colorado at Boulder, 1–3 November.
Madrid IV: Inferentialism in Epistemology and Philosophy of Science, Madrid, 11–13 November.
Reduction and Emergence: Reduction and Emergence in the Sciences, LMU Munich, 14–16 November.
Philosophy of Medicine Roundtable: Columbia University, New York, 20–21 November.
SCAI: 12th Scandinavian Conference on Artificial Intelligence, Aalborg, Denmark, 20–22 November.

December

PRIMA: 16th International Conference on Principles and Practice of Multi-Agent Systems, Dunedin, New Zealand, 1–6 December.
TPNC: 2nd International Conference on the Theory and Practice of Natural Computing, Cáceres, Spain, 3–5 December.
AJCAI: 26th Australasian Joint Conference on Artificial Intelligence, Dunedin, New Zealand, 3–6 December.
ICDM: International Conference on Data Mining, Dallas, Texas, 8–11 December.
LPAR: Logic for Programming, Artificial Intelligence and Reasoning, Stellenbosch, South Africa, 14–19 December.
OBayes: International Workshop on Objective Bayes Methodology, Duke University, Durham, NC USA, 15–19 December.
IICAI: 6th Indian International Conference on Artificial Intelligence, Tumkur, India, 18–20 December.

Courses and Programmes

Courses

ACAI Summer School 2013: Computational Models of Argument, King's College London, UK, 1–5 July.
EASSS: 15th European Agent Systems Summer School, Kings College London, 1–5 July.
ESSLLI: 25th European Summer School in Logic, Language and Information, Heinrich Heine University in Düsseldorf, Germany, 5–16 August.

IFAAMAS: Summer School on Autonomous Agents and Multi-agent Systems, Beijing, China, 9–12 August.
CN& C: Concepts, Normativity, and Cognition: Philosophical and Empirical Perspectives, Pärnu, Estonia, 26–30 August.
MLSS: The Machine Learning Summer School, Max Planck Institute for Intelligent Systems, Tübingen, Germany, 26 August–6 September.
EthicSchool: Virtual Summerschool on Ethics of Emerging Technologies, 9–13 September.

Programmes

APhil: MA/PhD in Analytic Philosophy, University of Barcelona.
Doctoral Programme in Philosophy: Language, Mind and Practice, Department of Philosophy, University of Zurich, Switzerland.
HPSM: MA in the History and Philosophy of Science and Medicine, Durham University.
Master Programme: in Statistics, University College Dublin.
LoPhiSC: Master in Logic, Philosophy of Science & Epistemology, Pantheon-Sorbonne University (Paris 1) and Paris-Sorbonne University (Paris 4).
Master Programme: in Artificial Intelligence, Radboud University Nijmegen, the Netherlands.
Master Programme: Philosophy and Economics, Institute of Philosophy, University of Bayreuth.
Master Programme: Philosophy of Science, Technology and Society, Enschede, the Netherlands.
MA in Cognitive Science: School of Politics, International Studies and Philosophy, Queen's University Belfast.
MA in Logic and the Philosophy of Mathematics: Department of Philosophy, University of Bristol.
MA Programmes: in Philosophy of Science, University of Leeds.
MA in Logic and Philosophy of Science: Faculty of Philosophy, Philosophy of Science and Study of Religion, LMU Munich.
MA in Logic and Theory of Science: Department of Logic of the Eotvos Lorand University, Budapest, Hungary.
MA in Metaphysics, Language, and Mind: Department of Philosophy, University of Liverpool.
MA in Mind, Brain and Learning: Westminster Institute of Education, Oxford Brookes University.
MA in Philosophy: by research, Tilburg University.
MA in Philosophy of Biological and Cognitive Sciences: Department of Philosophy, University of Bristol.
MA in Rhetoric: School of Journalism, Media and Communication, University of Central Lancashire.
MA programmes: in Philosophy of Language and Linguistics, and Philosophy of Mind and Psychology, University of Birmingham.

MRes in Cognitive Science and Humanities: Language, Communication and Organization: Institute for Logic, Cognition, Language, and Information, University of the Basque Country, Donostia, San Sebastian.
MRes in Methods and Practices of Philosophical Research: Northern Institute of Philosophy, University of Aberdeen.
MSc in Applied Statistics: Department of Economics, Mathematics and Statistics, Birkbeck, University of London.
MSc in Applied Statistics and Datamining: School of Mathematics and Statistics, University of St Andrews.
MSc in Artificial Intelligence: Faculty of Engineering, University of Leeds.

MSc in Cognitive & Decision Sciences: Psychology, University College London.
MSc in Cognitive Science: University of Osnabrück, Germany.
MSc in Cognitive Psychology/Neuropsychology: School of Psychology, University of Kent.
MSc in Logic: Institute for Logic, Language and Computation, University of Amsterdam.
MSc in Mathematical Logic and the Theory of Computation: Mathematics, University of Manchester.
MSc in Mind, Language & Embodied Cognition: School of Philosophy, Psychology and Language Sciences, University of Edinburgh.
MSc in Philosophy of Science, Technology and Society: University of Twente, The Netherlands.
MRes in Cognitive Science and Humanities: Language, Communication and Organization: Institute for Logic, Cognition, Language, and Information, University of the Basque Country (Donostia San Sebastian).
Open Mind: International School of Advanced Studies in Cognitive Sciences, University of Bucharest.
PhD School: in Statistics, Padua University.

Jobs and Studentships

Jobs

Post-doc Position: in Set Theory, Torino University, until filled.
Assistant Professor: in Logic or Analysis, Department of Mathematics, University of Connecticut, until filled.
Post-doc Position: in Artificial Intelligence, Institute for Artificial Intelligence, University of Georgia, until filled.

Post-doc Position: in Philosophy of Science, University of Johannesburg, deadline 15 July.
Post-doc Position: in Philosophy of Science, KU Leuven, deadline 30 September.

Studentships

PhD Position: on project "Non-Classical Foundations of Mathematics," Department of Mathematics and Statistics, University of Canterbury, New Zealand, until filled.
PhD Position: on the project "Models of Paradox," Philosophy, University of Otago, until filled.
PhD Position: in Philosophy of Science and / or Epistemology, University of Vienna, deadline 4 July.