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§1

EDITORIAL

It is a great pleasure to join *The Reasoner* as a guest editor for the last month of this year. I want thank Jon Williamson and Federica Russo for their invitation. This month we will talk with Johan van Benthem, Professor of Logic at the University of Amsterdam and Stanford University. Before starting our conversation, I would like to say a few words about the background.

A long-term project was started in October 2006, with the aim of translating van Benthem's classic works into Chinese, making them accessible to a wide variety of Chinese readers in various disciplines. Volume I "Logic, Information and Interaction" on pure and applied modal logic, and Volume II "Logic, Language and Cognition" on logic and natural language have been published with Beijing Science Press in 2008 and 2009. Volume III "Modal Correspondence Theory" is in print right now. I have the honor of being the general editor of this series, called "A Door to Logic". (逻辑之门). The translators are a group of young logicians coming from different Chinese Universities.

At a recent meeting in Beijing of "Author Meets Translators", a tradition of our series, we had an interview with Johan van Benthem on various issues that emerged from the translated papers and the translation experience. The meeting turned out to be not only an interaction between logicians from China and Europe, but also an encounter between different cultures. Now I would like to leave you with the following questions and answers selected from the interview, and mainly directed toward logic, language, computation, and in the end even culture and society. I hope you will enjoy it.



Tsinghua University, Beijing

§2

FEATURES

Interview with Johan van Benthem

[Johan van Benthem](#) is University Professor of logic at the University of Amsterdam, and Henry Waldgrave Stuart Professor of philosophy at Stanford University. So far, he has published 6 monographs, 3 textbooks, some 300 academic research papers, and edited 4 influential handbooks. His research covers a wide range of topics: modal logic, temporal logic, logic of natural language, philosophy of logic, information dynamics, logic and games, and more.

Fenrong Liu: You started out as a mathematically oriented logician, as readers can see in the first volume on modal logic that we have translated. How did you get inter-

ested in natural language, which seems a ‘softer’ subject?

Johan van Benthem: You are quite right, to get there, I underwent a change! As a student I was educated by the famous Misleading Form Thesis of Russell and Carnap that natural language is unsystematic, and that we need formal languages to correct it, or even replace it for the purpose of logical reasoning. I was thrilled by its stark austerity. But gradually, I came to see that logic and linguistics have a long shared history: Aristotle did ground-breaking work on both. Then in the 1960s linguistics underwent its modern mathematical turn, I took courses in Chomsky’s new theories. We learnt about many surprising and beautiful patterns, showing that natural language was not unsystematic at all. In the 1970s, under the influence of Richard Montague’s work on formal semantics, Amsterdam became a hotbed for interfaces between logic and natural language, and the ILLC still is a leading research center worldwide.



You can ask for deep reasons here, but it is always *people* that create such a ‘wave’. Many of our best philosophy students were interested in language, such as Jeroen Groenendijk and Martin Stokhof. Also, the Dutch linguist Frans Zwarts, one of my high-school friends, worked together with me on generalized quantifiers, ‘natural logic’ and other topics linking logic and language. I got swept along by this wave, and over three decades, it has carried me all the way to my current interests in logical dynamics and intelligent agency. There is much more to be told—and a nice history is in a master’s thesis in Groningen (Leonoor van der Beek, ‘Van Beth tot Van Benthem: de opkomst van de Nederlandse Semantiek’, 2001).

Xinwen Liu: This second volume is about logic in connection with language. In China, we call such research “yuyan luoji” (linguistic logic). But it is not clear to people what linguistic logic is, as there is no commonly accepted definition. Can you provide one?

Johan van Benthem: I would say that ‘linguistic logic’ is the study of both the static structure and the dynamic uses of natural language by means of concepts and techniques from logic. But this is not a static definition: the interface between the two disciplines is evolving over time. It is not just a matter of applying logic as it is to fixed linguistic questions, but also of creating new themes. For instance, the ‘generalized quantifier theory’ of the 1980s is a common child of the two disciplines, and the same may be said for current logics of information dynamics. Also, influence can just as well flow the other way, and insights about natural language may provide new perspectives on logical systems. This happened in the 1980s in the ‘situation semantics’ of Barwise & Perry, or the ‘discourse representation theory’ of Kamp, new paradigms in logic that came from the semantics of natural language.

Yu Yu: Your Handbook of Logic and Language appeared in 1997, more than 10 years ago. What are the latest directions in the area that have happened since that time?

Johan van Benthem: Good question, and it had already occurred to the two editors Alice ter Meulen and me! We have reassessed the chapters, and found that some areas have more or less remained the same, while others evolved rapidly, and also, new areas and trends have emerged. As to the latter, connections with computer science have become stronger, and in line with this development, the dynamics of language use has

become a broad topic, all the way up to current game-theoretic views of natural language. Another important new development has been the rise of Optimality Theory as a non-rule-based view of language based on preferences of language users induced by ordered ‘constraints’. Next, the topic of learnability of natural languages has become more important, and connections between learning theory, computer science, philosophy, and logic are strengthening. Then I would mention the growing influence of probabilistic methods working over large corpora of text and records of actual language use. This represents an important shift in attitudes.

Much work in logic and language tended to be a sort of armchair philosophy driven by ‘intuitions’ of the researchers writing the papers. Nowadays, large-scale records of actual usage, and probabilistic patterns in them, seem at least as legitimate as the evidence that our logical theories should explain, perhaps even more legitimate. Connected with the latter trend is the rising influence of cognitive science, which affects many themes in logical semantics. There, too, sophisticated models are partly logical, partly probabilistic, since language use (or reasoning, for that matter) involves the interplay of two basic cognitive skills: powers of applying rules and powers of memory. (By the way, all these trends also pose exciting challenges to fundamental logical theory.) So, the interface is evolving and expanding, and it will not surprise you that we are currently preparing an updated version of the *Handbook of Logic and Language*, that should appear on the web soon.

Liyang Zhang: In your article “Computation as Conversation”, when talking about ‘Computation in Europe’, you write: “Thus, what is going on at, say, all those Parisian terraces as I write these lines, on the last day of the Tour de France, is one gigantic parallel computer.” I find it an appealing metaphor, but can you say something more about this idea?

Johan van Benthem: Liyang, you have seen already in my earlier answers how computation is a running theme in my view of language. In particular, ‘logical dynamics’ treats the many uses of language and related cognitive activities as processes of computation over information states. And when you then study multi-agent processes like argumentation, where goal-directed strategic interaction is crucial, this can still be viewed as generalized interactive computation. But a good analogy points both ways. In the paper that you translated, I show how conversation may be viewed as a process of computation, but conversely, I also show how modern forms of computation (say, between agents in distributed systems) may be viewed as information exchanges like we humans do. I also show how many ideas from the one area ‘transfer’ to the other, such as program and game structures, suggesting lots of new research questions.

Now about those terraces! I finished the paper on a beautiful summer day, when crowds of people were sitting on terraces enjoying the sun and talking: the whole city was buzzing. And a strange thought suddenly occurred to me. Since conversation may be viewed as computation, we could really think of all those conversations as computing some function (of course, without anyone being aware of this), maybe even a useful one—provided we can find a suitable decoding key. Of course, this is just a fancy idea—but I wrote it to loosen up people’s minds about the potential of this analogy.

Yi Wang: Generally speaking, my complaint is that we are following the western way of expressing and (maybe) thinking. But I am concerned with differences behind

languages and cultures. For instance, when tutoring a course on “Classical Chinese Philosophy” in Auckland, I found that what I think interesting is often not the case for English-speaking students, and vice versa. They get excited by philosophers like Mozi, who think more like them, whereas for me, a Daoist like Zhuangzi, who thought language, debate and logic were useless, is much more congenial. What underlies those differences? Language, logic, culture?

Johan van Benthem: These are great questions, and again, they have been debated for a long time. As a student, I read Benjamin Lee Whorf’s classic *Language, Thought and Reality*, Wiley, 1956. Based on field-work with many human languages, it stated ‘Whorf’s Thesis’ that ‘language determines thought’. Thus, for him, speakers of different languages think really differently—and our planet is full of tragic misunderstandings all the time (he has wonderful examples). But many of these issues are not very well-defined, and I will just make a few points.

How different are human languages? Many people have very strong opinions about this, but it is partly a matter of empirical fact. And I think it is fair to say that one often finds: languages are not as different as you would think. Of course, there are lots of surface differences, in syntax order, or choice of words, but often, patterns of thought feel similar. More concretely, the linguist Geoff Pullum once demolished the famous ‘urban myth’ that Eskimo languages have 60 words for snow, whereas English has only one or two, so that Eskimo’s have an incredibly deeper ‘snow experience’ than English speakers. If you really study the fact about Eskimo languages (people who like the myth of course never do), you find that their vocabulary for snow is about the same as that of English. In fact, English snow vocabulary even seems a bit richer—which makes sense, since English is a huge ‘assimilating’ language that has absorbed so many influences. In fact, I would be very surprised if humans really thought differently, given the short term of our biological evolution, and especially, the very short time since we all left Africa. But again, I am totally open to empirical findings here. For instance, it has been suggested that working with a character language like written Chinese, rather than an alphabet language leads to systematic differences in which thoughts proceed and inferences are made. Maybe so. Let’s do the experiments, and ask the brain scientists.

Now about culture. There are different levels where you can look for differences or similarities. Take social customs. Say, forms of politeness may look very different in China and the West, but sometimes you suddenly see the underlying *invariance*: the custom is a solution to a problem that makes equal sense in the other culture. Every culture has social hierarchy, every culture needs to show respect, and a Western speaker is just as attuned to very slight deviations from norms of politeness as an Asian speaker. But the surface forms in which this politeness is realized (also in our language use, by the way) can be different. I tend to think of human cultures as different solutions, under different circumstances, to the same problems of coordination and basic human needs.

Moreover, it is important to realize that cultures are not static, but dynamic. For instance, the term ‘Western Culture’ is extremely undefined. Western Culture is really a historical merge of influences from the Middle East (the very fact that we work with alphabet languages comes from there), Greece, Rome, Europe, America, and so on, and it continues to absorb new ideas all the time. A comparison that ‘fixes’ cultures to some essentialist unchanging definition seems pointless to me. In this respect, I

am sometimes surprised by Chinese colleagues who tell me (like you) that there is a mainstream ‘true Chinese culture’, whereas the others, say the Mohist logicians, were a sort of Western ‘fifth column’ which has (fortunately?) died out. Obviously these people were as Chinese as anyone, and the very fact that they had these ideas shows again a sort of unity to human thinking: good ideas occur across cultures. Vice versa, what you say about the attitudes of Zhuangzhi can also be found in the Western tradition. Let me just quote the famous anti-logical Church Father Tertullian, who once said in defense of the Christian Faith: “Credo Quia Absurdum” (I believe because it is absurd). Finally, one amazing fact is that human languages can merge, or at least, adopt large parts of other languages. This very fact shows that the borders are not so rigid. Even misunderstandings can be fruitful here. Leibniz thought, based on very little knowledge, that the Chinese character script was close to being the perfect universal Language of Thought. This partly inspired him to his work on ideal logical languages, universal computation, and so on. These are the cross-cultural phenomena that I find amazing. I am sure we will have many more creative surprises, as our contacts increase.

Does Possible Worlds Semantics Make Sense?

Lets assume that the following basic modal facts are true.

- (i) Socrates could have been a carpenter.
- (ii) Socrates is necessarily human.

According to Possible Worlds Semantics, (PWS), the modal statements (i) and (ii) are made true in part by the distribution of non-modal properties. Generalizing over specific interpretations of (PWS), (i) is true when Socrates is related in the right way to something in another world that has the non-modal property of being a carpenter. (ii) is true when Socrates is related in the right way to many things in many worlds having the property of being human, and not related in the right way to something that is not a human.

Moving down a level of generality, there are at least two accounts of how (i) and (ii) are true. Let any view that maintains that Socrates can only exist in one possible world be called a *world-bound-Individual* account, (WI). David Lewis’s counterpart theory serves as one kind of account of world-bound-individuals. Let any view that maintains that Socrates can exist in more than one possible world be called a *trans-world-individual* account (TI). Alvin Plantinga has defended an account of trans-world-individuals.

According to (WI) the truth conditions for (i) and (ii) are

- (iii) There exists a possible world in which Socrates’ counterpart Socrates* is a carpenter.

and

- (iv) In every world in which Socrates has a counterpart, Socrates’ counterparts are human.

According to (TI) the truth conditions are

- (v) There exists a possible world in which Socrates is a carpenter.

and

- (vi) In every world in which Socrates exists, Socrates is a human.

However, if (WI) and (TI) are exhaustive of the possible interpretations of how (PWS) can render (i) and (ii) true, then it seems to me that there is a family of intuitive problems with (PWS). These problems are well known, but when put together appropriately they raise questions about the adequacy of (PWS).

1. If (PWS) is an adequate account of modality, then either (WI) or (TI) adequately explains the truth of (i)-(ii).
2. If (WI), then the truth-makers of modal statements are irrelevant.
3. If (TI), then the truth-conditions for modal statements are inconsistent.
4. So, neither (WI) nor (TI).
5. So, (PWS) is an inadequate account of modality.

Argument for (2): According to (WI) Socrates cannot exist in more than one possible world. He exists only in the actual world (i.e., our world). And according to counterpart theory Socrates has the modal property *could have been a carpenter* because his counterpart, Socrates*, has the non-modal property of being a carpenter. But how does the fact that Socrates* has the property of being a carpenter, and the fact that Socrates* in w is the most similar person to Socrates of the actual world make true a modal statement about Socrates? And why are those non-modal facts relevant to Socrates' modal properties? Lewis recognized this problem. It seems *prima facie* that we need an explanation of why a in w_1 being most similar to b in w_2 and Fa in w_1 , explains $\diamond 'Fb'$ (ii) is also worrisome. According to (WI) Socrates is necessarily human because in every world w_n , in which a Socrates^{*n*} distinct from but most similar to Socrates[@] exists, Socrates^{*n*} has the property of being human. How is the fact that a plethora of non-identical individuals possessing a single property *relevant* to Socrates having a modal property? Is it merely their cross-world similarity?

Argument for (3): According to (TI) Socrates, one and the very same individual, exists in a plurality of possible worlds. And it is because he, himself, has various properties in those possible worlds that he has certain modal properties in the actual world. For example, (i) is true, since Socrates in another world w has the property of being a carpenter. But here is a problem. As Lewis himself questioned: How can Socrates both have the property of being a carpenter and not being a carpenter? Perhaps an analogy with time helps out. Just as Socrates can be lecturing to Glaucon at t_1 and not lecturing to Glaucon at t_2 without there being any contradiction, it is likewise that Socrates can be a philosopher in @ and a carpenter in w . If time-indexed properties make sense, then perhaps world-indexed properties make sense as well. However, a problem persists. On

the four-dimensional model Socrates is a certain extended object over time with temporal parts. And the truth of ‘Socrates is lecturing to Glaucon’ is made true because a proper part of Socrates—Socrates at t_1 —has the property of lecturing to Glaucon.

If we follow the analogy with time in the case of modality, we reach inconsistency. Originally (TI) maintained that one and the same Socrates exists in a plurality of possible worlds. But if the analogy is taken seriously, then Socrates is actually, not only a scattered object over time, but also a scattered object over possible worlds. Socrates being a philosopher in @ is part of Socrates, just as Socrates being a carpenter in w is part of Socrates. If the analogy is held with Socrates across worlds, then Socrates in @ and Socrates in w are a part of Socrates. But now the attempt to make true Socrates could have been a carpenter by saying that Socrates, the very same individual, is in w a carpenter is false, since one and the same Socrates is not in any possible world. Rather, Socrates is spread out across modal space.

For those familiar with the problems presented here, it is clear that there are avenues to defend either (WI) or (TI). For example, (WI) could be defended by blocking the requirement of relevance. Perhaps our intuitions are wrong about what makes true Socrates’ modal properties. And (TI) could be modified so that (i) is true just in case part of Socrates is a carpenter. However, the point here is that when these intuitive problems are put together one can question whether the problem stems from (PWS) itself. Perhaps something is wrong with the structure of how modality is analyzed as quantification over a fixed domain of entities.

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TEMPUS DICTUM

Technological Aids to Cognition <http://tempusdictum.com>

Addendum

Hartley Slater wishes it to be known that the formal proof of modal collapse set out and discussed in his ‘Some New Propositional Inferences’ (*The Reasoner* 3.11:7-8) originated with Hannes Leitgeb, and specifically has now appeared in ‘Formal and Informal Provability’ in O. Bueno and O. Linnebo (eds) *New Waves in Philosophy of Mathematics*, New York, Palgrave Macmillan (2009), 263–299.

§3

NEWS

Universal Logic: Understanding the Many Ways of Reasoning

For many centuries logic was mainly Aristotelian logic. Then, at the end of the XIXth century, many changes took place and since then many new logics have appeared, so

many that it is not obvious anymore how to answer the question “What is logic?”.

Universal logic is a way to answer this question, by clarifying central concepts of logic and developing tools to understand how they work. The name was coined by analogy with the expression “universal algebra”: universal logic can be viewed as a general theory of logics in the same way as universal algebra is a general theory of algebraic structures. Universal logic is therefore not one logical system that applies to everything. It is similar to general linguistics which is the study of common features of all languages, not one universal language. Universal logic is the study of the world of existing and possible logics.

The idea is to study logical structures, in particular how they can be identified, combined and translated into each others. Common features and properties of classes of logical structures are examined, such as the world of modal logics or the world of sub-structural logics. The scope of validity and domain of applications of important theorems such as cut-elimination, interpolation or compactness is also a main theme. But universal logic is not a purely mathematical investigation of reasoning; its aim is to gather all people interested in logic from different perspectives: linguistics, computation, philosophy, artificial intelligence, psychology, etc. by asking fundamental questions about the very nature of reasoning and developing powerful frameworks to answer them. Universal logic is at the same time a very abstract field of research using mathematical concepts (from model theory category theory, topology and much more) and at the same time it is inspired by experiments (in physics, biology, and the neuro-sciences) and directed towards applications. Although the term “universal logic” was coined in the 1990s, the field has existed for many years and can be traced back to the work by Tarski on consequence operators at the end of the 1920s.

In 2005 the First World Congress and School on Universal Logic was organised in Montreux, Switzerland. This event gathered more than 200 people from about 40 different countries. Among participants were Michael Dunn, Dov Gabbay, Saul Kripke, David Makinson, Stephen Read, and Krister Segerberg. More than 20 tutorials were offered ranging from non-monotonic logic to abstract model theory. There was also a contest about how to identify two logical structures. A second event of this kind was organized in Xi‘

‘an, the ancient capital of China in 2007, under the auspices of the Terracotta Warriors, with the participation of people such as Vincent Hendricks, Wilfrid Hodges, Heinrich Wansing, and Jan Wolenski. The third edition of the world congress and school on universal logic is scheduled to take place in Lisbon, April 18-25, 2010, with participation by, amongst others, Patrick Blackburn, Hartry Field, Yuri Gurevich, and Dana Scott. Details are available [here](#). In 2005 Birkhäuser/ Springer published a book entitled *Logica universalis. Towards a general theory of logic*, which was a collection of recent papers on universal logic. Then the journal *Logica Universalis* was launched in 2007 by the same publisher. In 2008, there was a special issue (volume 2, number 1) on the square of opposition, which can be viewed as a central concept and tool of logic.

There is now a special issue in preparation about the question “Is logic universal?”. Any contributions dealing with one aspect of the topic—in particular answering the questions below—can be submitted (deadline February 1st, 2010).

- (1) Do all human beings have the same capacity of reasoning? Do men, women, children, Papuans, yuppies, reason in the same way?
- (2) Does reasoning evolve? Did human beings reason in the same way two centuries ago? In the future will human beings reason in the same way? Are computers changing our way of reasoning? Is a mathematical proof independent of time and culture?
- (3) Do we reason in different ways depending on the situation? Do we use the same logic for everyday life, in physics, and in questions to do with the economy?
- (4) Do the different systems of logic reflect the diversity of reasoning?
- (5) Is there any absolutely true way of reasoning?

A book series *Studies in Universal Logic* was also launched by Birkhäuser/ Springer. Two volumes are already released, one about a general theory of completeness for zero-order logics by Witold Pogorzelski and Piotr Wojtylak and one about institution-based model theory, by Razvan Diaconescu. An anthology gathering 15 papers from 1922 to 1996 connected with universal logic will be released soon. This anthology will include the first English translations of papers such as Paul Hertz's paper "Über Axiomensysteme für beliebige Satzsysteme"—the point of departure of sequent calculus and natural deduction, and Tarski's first paper on consequence operators "Remarques sur les notions fondamentales de la méthodologie des mathématiques". All papers will be presented by a specialist in the area, for example there will be a presentation of Kripke's paper "Semantical considerations on modal logic" by Johan van Benthem, a presentation of Lindström's paper "On extensions of elementary logic" by Jouko Väänänen, and a translation and presentation by Jonathan Seldin of a work of Haskell Curry originally in French: "Leçons de logique alg'

'brique". In 2010 two additional books should be released, *The Connectives* by Lloyd Humberstone, and *Kripke's World* by Andreas Herzig et al. These are two monumental books, the first one being a two volume book of about 1500 pages presenting systematic studies of connectives, and the second one showing the multiple aspects and applications of Kripke structures.

A universal logic corner has also been opened in the *Journal of Logic and Computation* (Oxford University Press), and the book *Perspectives on Universal Logic* was published by Polimetria in 2007—a volume of 430 pages collecting 25 research papers on the subject.

Jean-Yves Béziau
FUNCAP/CNPq-UFC, Brazil

The Transatlantic. Journal of Economics and Philosophy

A recent initiative by students at US and UK universities is launching a student publication in the field of Economics and Philosophy. The [journal](#) promotes an interdisciplinary

approach and thus wishes to span the gulf between Economics and Philosophy. *The Transatlantic* will be produced and published in London and New York simultaneously and will be distributed at a variety of universities in both countries and beyond.

Topics will encompass a vast array of subjects, ranging from the ontology, epistemology and methodology of economics and the foundations of rational choice and game theory, to ethics and welfare economics, as well as the history of economic thought. While it is designed as a preprofessional platform for both undergraduate and graduate students, each edition will also feature guest articles by expert academics of the area. *The Transatlantic* serves as a global forum for those with an interest in the field.

The Transatlantic is now accepting submissions for the first issue on the topic “Economics & Science”, which will be out by the beginning of 2010. We welcome contributions from young scholars from across the globe. One of the guest articles for this edition will be by Emanuel Derman, professor of Physics at Columbia University and former managing director at Goldman Sachs, who has written extensively on the relation of Physics and Finance.

If you would like to get involved, please e-mail us at info@thetransatlantic.org. This is a great way to gain experience in a variety of fields, ranging from marketing and managing to design, layout, reviewing and publishing. If you wish to write for the forthcoming issue, please send us an abstract of your article by November 16, 2009 to submit@thetransatlantic.org. The full article should be approximately 1000-1500 words and will be due in December 2009. We hope to hear from you.

The Transatlantic Team

Research Project in Paris and Konstanz

Last April, a three-year research project, CausaProba, began in both Konstanz and Paris. The project is a collaboration between the department of Philosophy of the University of Konstanz and the IHPST. It is led jointly by Wolfgang Spohn and Jacques Dubucs, and it is co-financed by the German Deutsche Forschungs Gemeinschaft and the French Agence Nationale de la Recherche.

The project deals with causation and its relationship with probability. It falls out into four subprojects, which concern respectively: actual causation, the relationship between mechanistic and counterfactual conceptions of causation, causation at different levels, and the objectivity of causation.

Several post-docs have already been hired, two in Konstanz (Michael Baumgartner and Luke Glynn) and one in Paris (Francis Longworth). On the Paris side, a reading group has been scheduled and the monthly research seminar devoted to probability will host the project for three years. On the Konstanz side, a weekly ‘Causality and Probability’ research colloquium has been established to allow the discussion of work-in-progress by collaborators and associates of the project. Research visits, by Konstanz people in Paris and by Paris people in Konstanz, will take place. Several workshops have been envisaged, beginning next winter, and a larger conference will be organized for the end of the project.

The activities of the CausaProba project will be duly advertised. Wide participation, both in Paris and in Konstanz, is welcome, as well as suggestions.

Isabelle Drouet
Philosophy, Louvain

Joint Attention: Developments in Developmental and Comparative Psychology, Philosophy of Mind, and Social Neuroscience, 1–4 October

The event, which was held at Bentley University in Greater Boston from October 1-4, 2009, featured fifteen invited and twenty contributing speakers, as well as a poster session with twenty-five posters. Altogether there were 75 participants. A brief summary of the invited presentations follows below; for reasons of space, the contributed papers and posters cannot be included here.

The keynote talk was given by John Campbell (Philosophy, UC Berkeley), who introduced the case of ‘collective attack’ to argue that a representational account could not accommodate the openness of joint attention, and made the case for a relational alternative. Axel Seemann (Philosophy, Bentley University) drew on Campbell’s work to consider the role of the other person in episodes of joint attention. Dan Hutto (Philosophy, University of Hertfordshire) motivated an enactivist understanding of joint attention, on which basic forms of embodied engagement shape participants in episodes of joint attention. Shaun Gallagher (Philosophy, University of Central Florida and University of Hertfordshire) argued against the idea that joint attention requires psychological coordination of attention conceived as a coordination of mental states or propositional attitudes. Coordination in joint attention, he suggested, is better characterized in terms of embodied interaction. Corrado Sinigaglia (Philosophy, University of Milan) argued that most of the primary ways of making sense of others are motor in nature and rooted in a specific brain mechanism: the mirror mechanism. Elisabeth Pacherie (Philosophy, Institut Jean Nicod) spoke about joint control and the phenomenology of joint action; she was particularly concerned with the relation between the senses of I- and We-agency. Karsten Stueber (Philosophy, College of the Holy Cross) suggested that an understanding of joint attention in terms of an intersubjective and embodied engagement led to the conclusion that folk psychology was far less important for the understanding of other agents than previously thought.

Peter and Jessica Hobson (Psychology, UCL) investigated the notion of ‘sharing’ attentional states by drawing on research in developmental psychopathology. They were concerned with the question what may be learned from empirical studies of children with early childhood autism and congenital blindness for the capacity to jointly attend to objects with others. Colwyn Trevarthen (Psychology, University of Edinburgh) investigated the idea that all arts and techniques need communication of aesthetic and moral sentiments for the creation and transmission of the value of ideas between human minds in human bodies. Vasu Reddy (Psychology, University of Portsmouth) argued that emotional engagements from birth allow infants to experience attention directed

to themselves, and that it is these experiences which give meaning to others' attention. Andrew Meltzoff (Psychology, University of Washington) and Henrike Moll (Psychology, Max Planck Institute Leipzig) provided empirical evidence that by 12 months of age, infants skillfully and flexibly engage in joint visual attention with others. Instead of "blindly" following another person's head turn, they take into account if the other person is able to see through a (sham) blindfold or not. Kim Bard (Psychology, University of Portsmouth) was concerned with gene-environment interactions in the development of joint attention. She investigated the extent to which joint attention occurs spontaneously in chimpanzee infants. David Leavens (Psychology, University of Sussex) argued that direct comparisons of non-institutionalized human children in intact families with institutionalized, orphaned apes cannot, in principle, demonstrate species differences independently of rearing history differences. William Hopkins (Psychology, Agnes Scott College) described studies that have focused on the neural correlates of joint attention in chimpanzees. Tim Racine (Psychology, Simon Fraser University) stressed the need for a thorough rethinking of the cognitivist and adaptationist frameworks within which researchers approach joint attention.

Axel Seemann

Department of Philosophy, Bentley University

The Background of Institutional Reality, 16–17 October

On October 16th and 17th the University of Constance hosted the first conference organized by the European Network of Social Ontology (ENSO) entitled "The Background of Institutional Reality". Twenty invited papers were presented by philosophers, sociologists and cultural theorists representing eleven countries across three continents.

The conference was organized by dividing the presentations into six thematic panels which each represented a direction or perspective embodied by the current social ontology movement. The first panel, together with the keynote address given by Raimo Tuomela, was devoted to some of the fundamental issues within social ontology. Beginning with the methods of analytical philosophy, the primary question is how to make sense of social objects and the mental states which constitute them. To what degree is social life comprised of the Tuomelian *we-mode* and how much of it is simply the result of self-interested agents working together for the common benefit of all? What is the status of statements that bare an intentionally vague meaning and how does the Searlian Background affect our beliefs and perceptions of the world?

The second panel focused on certain critical perspectives that are informative for current social ontological research. These papers addressed, among other things, the need for arbitral mechanisms in institutional reality, the inability of shared intentions to explain certain self-perpetuating mechanisms of firms and problems arising in the interplay between common knowledge and collective intentionality.

The third panel presented the question to which extent social ontology can be reconciled with German Idealism. Even though its heritage is from a very different tradition, social ontology, much like the tradition of continental philosophy, has come to concern

itself with issues involving the very construction of society and the ways in which society influences and determines the actions and preferences of individuals. In this panel the notion of *Geist* was compared to the Background, a Marxist interpretation of institutional reality was given and the institution of marriage was analyzed according to a Hegelian framework.

In the fourth panel, Joint Intentionality and the Background, a solution was provided to the problem of conflicting desires in the context of joint intentions, the Background was justified on the basis of developmental psychology and the question of the normative nature of the Background was addressed.

The final substantive panels analyzed social ontology through the lens of phenomenology and Habermasian communicative theory. Issues developed here were the extent to which institutional rules are essential and the extent to which they are perfectly arbitrary as well as the ways in which discourse theories can inform a sound analysis of institutional reality. Further themes were the centralized manipulation of the background on the example of political and media centered responses to the terrorist attacks of September 11, 2001 and also the relationship between the faculty of language and concrete realizations thereof.

The conference concluded by opening a discussion regarding the future of the European Network on Social Ontology.

Trevor Wedman
University of Innsbruck

Rational Consensus in Science and Society, 20 October

As part of an AHRC network grant, the LSE Choice Group organises a series of master classes by leading researchers on topics related to decision and game theory, social choice and decision-making.

The first of those was given by Carl Wagner, Professor of Mathematics and Adjunct Professor of Philosophy at the University of Tennessee, and co-author with Keith Lehrer of the 1981 monograph “Rational Consensus in Science and Society” The two master classes focused on the mathematical foundations of the model, introducing the method of iterated averaging in the first lecture and providing its axiomatic foundations in the second lecture.

The first lecture entitled “The French-DeGroot-Lehrer Model of Consensus” introduced a number of different interpretations of the method of iterated weighted averaging. The main idea of this method is that individuals assign weights to each other that reflect how much the opinion of the individual should count in group decision-making. The result is a weight matrix. If the matrix itself is repeatedly multiplied through by the weights, the product will converge to a unanimous assignment of weights to all individuals in the group, provided there are suitable patterns of respect between individuals.

The second lecture entitled “The Axiomatics of Aggregation” provided an axiomatic characterisation of weighted means with independence of alternatives (a separability condition) and zero preservation (a unanimity condition) axioms playing the central role.

The approach allowed discussion of the implications of several axioms in allocation aggregation problems as well as in aggregating probability measures.

In the evening, Carl Wagner also gave a Choice Group seminar talk on “Independence Preservation in Expert Judgment Synthesis”, in which he argued against requiring “universal” application of independence, showing several reasonable ways of preserving epistemically significant cases of independence when probability pooling is conceived in analogy with the single profile social welfare theory of Bergson and Samuelson.

The rational consensus emerging was that the activities of the day formed a perfect start for the series of master classes, providing many students and researchers with very useful formal background to the Lehrer/Wagner model and group decision-making more generally.

LSE Choice Group

European Philosophy of Science Association, 21–24 October

The second conference of the recently formed European Philosophy of Science Association (EPSA) took place at the VU University, Amsterdam from October 21st to 24th 2009. The conference was a great success, like its predecessor in Madrid 2007, and demonstrates that EPSA, which was born just three years ago, has already come of age. EPSA is a Europe-wide subject association for philosophers of science, which aims to unite the rich, diverse and multi-faceted work in the field that takes place across the continent. EPSA will hold a major conference biennially, in the year when the PSA conference is not running; the next conference is scheduled for Athens in 2011.

The Amsterdam conference attracted a large number of philosophers of science from around the world, including Europe, the US and Australasia. The Programme Committee, headed by Samir Okasha (Bristol) and Stephan Hartmann (Tilburg), faced a difficult selection task, owing to the large number of high-quality submissions. Overall, the acceptance rate was approximately 50%, though the rate was substantially lower for contributed papers than for symposia. (Contributed papers were submitted individually, while symposia comprised a number of papers on a single theme, submitted jointly.)

The conference featured three plenary lectures: Martin Carrier (Bielefeld) whose talk was entitled ‘Knowledge, Politics and Commercialization: Science under the Pressure of Practice’; Mary Morgan (LSE) on ‘The Inferential Role of Facts’, and Elliott Sober (Madison-Wisconsin) on ‘Did Darwin write the Origin Backwards?’. In addition, there were 20 symposia and 28 contributed paper sessions, each comprising three to five papers. An edited volume of selected papers from the conference will be published in 2010 by Springer.

Both the symposia and the contributed papers covered a wide range of topics, spanning both ‘general’ philosophy of science and philosophy of the special sciences—including physics, biology, chemistry, medicine, economics, mathematics, statistics and psychology. Interestingly, the majority of the symposia were on special science topics, while the contributed paper sessions featured much more general philosophy of science. Overall, the balance between the two sorts of philosophy of science seemed reasonable,

and comparable to that found at a typical PSA conference.

Strikingly, some branches of philosophy of science were relatively under-represented. There was much less philosophy of biology than we were expecting, given the level of interest in the subject in the world-wide philosophy of science community, and philosophy of mind / psychology was also under-represented. The same was true to some extent of philosophy of social science. Conversely, one area that was quite strongly represented was formal epistemology, which has now clearly established itself as an important sub-discipline of philosophy of science.

Apart from the main content, the conference featured two special events: firstly, the General Assembly Meeting of the EPSA, and secondly, an interesting roundtable discussion entitled ‘Philosophy of Science in Europe: Past, Present and Future’, at which conference delegates discussed ways of further integrating and strengthening the philosophy of science community in Europe. Crucial in this endeavour is the need to get more philosophers of science to actually join EPSA, and to submit their papers to the newly-founded European Journal for the Philosophy of Science (EJPS), which is now accepting submissions. To join EPSA, please visit [here](#); to submit a manuscript to EJPS, please visit [here](#).

Samir Okasha

Department of Philosophy, University of Bristol

Probability, Uncertainty and Rationality, 1-3 November 2009 and Logical Foundations of Rational Interaction, 4 November 2009

These days there is a wide consensus on the idea that any reasonable attempt to grasp the logical basis of rational reasoning needs taking at least two issues very seriously. First of all, rational agents live and reason in a world about which they know very little: a substantial part of their reasoning is dotted with various sources of uncertainty. Secondly, agents tend to exercise their rationality in the public arena: some of the most interesting aspects of rational reasoning emerge in connection with various forms of interaction. The two events on which we are reporting here have been organized by the *Logical Foundations of Rational Interaction* group with the explicit aim of bringing together established scholars as well as young researchers who share this two-dimensional point of view on the logical foundations of rational reasoning.

In the multi-disciplinary context of these workshops, logic, in the broad sense, played of course a major cohesive role. Constantine Tsinakis (Department of Mathematics, Vanderbilt University) highlighted such a role by presenting some fundamental connections between the algebraic approach to logic and its role in formalising the notion of logical consequence. More specific topics were covered within two distinct yet very much related threads: probability and uncertainty on the one hand and collective and interactive reasoning on the other.

As to the former, David Makinson (London School of Economics) addressed some of the key difficulties which arise with the notion of conditional probability when conditioning on what he calls the *critical zone*. Marcello D’Agostino (Department of Hu-

manities, University of Ferrara) made a proposal to carry on de Finetti's work on *proper scoring rules* in connection with the accuracy of the assessment of personal probabilities. Ioana Leustean (Faculty of Mathematics and Computer Science, University of Bucharest) presented some very recent results on probabilistic reasoning in the context of many-valued logics, with particular emphasis on Łukasiewicz infinite-valued logic. On the same topic, but in a somewhat different vein, Vincenzo Marra (Department of Computer Science, University of Milan), proposed a methodological analysis of the mathematical results, asking whether various forms of uncertainty can be justifiably represented within a single logico-mathematical probability framework. An attempt towards bringing the notion of imprecise probability to bear on many-valued events was put forward by Martina Fedel (Department of Mathematics, University of Siena). Luis Godo (Artificial Intelligence Research Institute, Barcelona) took a more practical stance by discussing how various kinds of uncertainty can be represented in some real-world AI applications.

As to the social aspect of rational reasoning, George Wilmers (School of Mathematics, University of Manchester) presented some new results on collective choice which bring together ideas from probability logic, voting theory and information theory. Taking again an interactive perspective on logic, Chris Fermueller (Technical University of Vienna) discussed how Łukasiewicz logic can be fruitfully interpreted in game theoretic terms via *Giles's Game*. Two key aspects of rational interaction which have perhaps a less direct logical connotation but which play a fundamental role in the logical foundations of rational reasoning were also addressed. Luigi Guiso (Department of Economics, European University Institute, Florence) asked what is the right amount of *trust* that rational agents should attach to their peers in daily interactions. Gerardo Rescigno (Capital Adequacy & Credit Risk Management, Banca Monte dei Paschi di Siena) took on a similar issue by focussing this time on the rather ineffable notion of *reputation* and the risks which uncertainty connects naturally to it.

A number of more specific contributions were also given on all the above topics, which space constraints do not allow us to report here. However a selection of works presented at both workshops will appear in a volume of proceedings to be published in 2010. In the meantime the interested reader can find the full details about the events, including most presentations, on the group's website <http://www.crm.sns.it/lori>

Both events have been organised with the support of the *Fondazione Monte dei Paschi di Siena*.

Hykel Hosni

Centro di Ricerca Matematica E. De Giorgi, Scuola Normale Superiore, Pisa

Formal Methods, 2–6 November

FM2009 was the 16th symposium in the “FM” series organised by [Formal Methods Europe](#). It was also the [2nd World Congress on Formal Methods](#), and reported on research taking place in 23 countries from four continents. Its motto was “theory meets practice”, and this was reflected in the papers. A necessarily gross generalisation is that they

were about how rigorous reasoning techniques of various branches of mathematics can be used to meet the challenge imposed by the economical need to produce high-quality systems that use modern hardware and software technology.

Over the years, two categories of reasoning techniques have evolved largely independently: theorem proving and model checking (comprehensive exploration of the state space allowing verification of properties expressed typically in modal temporal logics). The latter is automatic, but limited in the range of models that it handles, and the former typically requires some degree of interaction. Various papers recognised the importance of combining both approaches.

The importance of quantitative reasoning has been indicated by four of the invited speakers. The applications mentioned include privacy policies modelling and verification (Jeannette Wing, Carnegie Mellon University), testing (Sriram Rajamani, Microsoft Research), and modelling of biological systems (Wan Fokkink, Vrije Universiteit Amsterdam). Carroll Morgan (University of New South Wales) presented results on combining models for reasoning about secure and probabilistic systems.

Two special tracks reported on tools to support the use of formal methods, and on applications of formal methods in industry. The amount of activity, and the quality of the results, indicate that industrial take up of formal techniques is becoming a reality. Another invited speaker, Colin O'Halloran (QinetiQ), discussed the business case—it is cheaper to use formal methods, since automation is possible even on an industrial scale.

The Best Paper Awards reflected the mood of the community. We could not identify one single best paper, and made two awards. One of them was for the paper “Making Temporal Logic Computational: a Tool for Unification and Discovery”, by Raymond Boute (Ghent University). It presents a novel technique for reasoning about temporal logic that is amenable to automation and promoted for use in industry. The other award was for the paper “Formal Verification of Curved Flight Collision Avoidance Maneuvers: A Case Study”, by Andre Platzer and Edmund Clarke, from Carnegie Mellon University. It describes the use of a new tool in the context of a challenging application. These papers are of a different nature: the former puts forward a theory to meet practice, and the second examines practice to find the right theory.

As Chairs of FM2009, we were pleased to see enthusiastic researchers and industrialists to come together, with different points of view in many cases, but a common goal: improving the state of the art on systems development through well-founded techniques. FM2009 was very well attended, with 343 participants. It was part of the 1st FMweek ([Formal Methods Week](#)), with over 750 attendees.

Ana Cavalcanti

Department of Computer Science, University of York

Dennis Dams

Bell-Labs, Murray Hill

Epistemology of Perception, 12–13 November

A workshop on The Epistemology of Perception was held on November 12-13 at the University of Geneva. The organizers of the event were Pascal Engel and The Episteme Research Group. The workshop was devoted to some contemporary perspectives in perception.

In his invited talk, 'Perceptual Knowledge and Justified Belief', Alan Millar (Stirling) discussed the problem of what constitutes justification in the case of perceptual knowledge. The main problem for this kind of knowledge is that its justification does not depend on having adequate reasons grounded on other beliefs. The suggested view makes a certain conception of a recognitional ability central and reverses the usual order of understanding between knowledge and justified belief: justified belief should be understood in terms of perceptual knowledge, and not vice versa.

Matthew Kennedy (Nottingham), 'Naive Realism, Evidence, and Epistemic Justification', argued against Nicholas Silins' claim that externalist views of evidence entail that bad-case subjects sometimes have more doxastic justification than good-case subjects. He developed a naive-realist theory of evidence in good and bad experiential cases which avoids the consequence that Silins attributes to externalists about evidence.

Santiago Echeverri (Institut Jean-Nicod), 'Belief Revision in the Light of Experience', defended a modest program in the epistemology of perception such as Pryor's (2000). He adopted a doxastic account of perceptual experience starting from a psychological approach. He argued that, since one of the functions of sub-personal perceptual processes is to give rise to appropriate perceptual beliefs, we should hold a dogmatist view of perceptual experience. He argued that his account answers to the phenomenon of the persistence of illusion.

Jérôme Dokic (Institut Jean-Nicod), 'On the Apparent Immediacy of Perceptual Judgments', worked to solve Alva Noë's puzzle of perceptual presence. The puzzle consists in the fact that we are able to perceive a complete object even though we see just a surface of it. Dokic holds that a cognitive account of perception can resolve the problem.

Adrian Haddock (Stirling), 'Perceptual Knowledge and Sensible Intuition', argued against John McDowell's claim that '[s]ome concepts that figure in knowledge afforded by an experience can be excluded from the content of the experience itself ... but not all can'. He argued for an answer to the question why it is the case that not all concepts are excluded from the content of experience. An answer was given, inspired by some remarks in the Transcendental Deduction.

Martine Nida-Rümelin (Fribourg), 'Knowledge about the Phenomenal Character of One's Own Perceptual Experience', argued that in having a perceptual experience we are aware of the perceptual objects and we are aware of having the relevant kind of experience. The key concept of her talk was S-phenomenal properties. The idea underlining this concept is that there are some overall aspects of our phenomenology given to

subjects.

Pascal Engel

Department of Philosophy, University of Genève

Methods for Modalities, 12–14 November

The workshop Methods for Modalities 6 (M4M-6) was held from the 12th to the 14th of November 2009 in Copenhagen, Denmark. The aim of the workshop was to bring together researchers interested in developing algorithms, verification methods and tools based on modal logic, where modal logic was understood in a broad sense.

The workshop started out with an invited talk by Renate Schmidt about two different approaches, via first-order resolution methods and the direct tableau synthesis framework, to automatically generate proof systems for a variety of modal logics. Later on admissibility in the same framework was also discussed. Resolution methods were discussed several times the first day whereas tableau methods remained a central theme throughout the workshop. Filtration also played a considerable role for termination of the tableau calculus and was also mentioned in a talk on what is called controller synthesis and orchestrator synthesis.

Modal logic for knowledge entered the picture in talks on tableaux for dynamic epistemic logics and two different approaches to proof systems for common knowledge. Modal fixpoint logics and automatas were also discussed the first day, for instance a tool for checking satisfiability and validity for modal fixpoint logics was presented. At the end of the day the discussion of tableau vs. solution methods was replaced by a discussion between tableau methods and methods based on automatas.

The second day started out with an invited talk by Kim Guldstrand Larsen about model checking for various extensions of Computational Tree Logic, and the usage of these in hardware and software verification and specification. Temporal logic remained central for the first half of the day. A tool for testing satisfiability for Linear Temporal Logic was presented, a new way of defining the Until operator using a “history” operator was offered, and finally undecidability of interval temporal logics containing a modality for interval overlap was shown.

After lunch the second day, invited speaker Yde Venema turned to coalgebraic logics when discussing Moss’ cover modality and cut-free Gentzen proof systems based on a modal distributive law. Later on a prover based on coalgebraic semantics was also presented. In addition, a simple to use multi S5 tableau prover was presented.

Franz Baarder opened the last day with an invited talk about how light-weight description logics such as EL had low complexity while still remaining useful in applications such as in biomedical ontologies. A later talk also combined description logic with coalition logic. The last day ended with two system descriptions where, yet again, tableau algorithms were used. Once more designing good blocking mechanisms for these was a central concern.

For more on the workshop and the full program, see [here](#).

Jens Ulrik Hansen
Philosophy and Computer Science, Roskilde University

Calls for Papers

ASSC ESSAY CONTEST: on Consciousness, deadline 15 December.

POPPER PRIZE: to the best essay in any area of the critical rationalist philosophy of Karl Popper, deadline 31 December.

TRANSHUMANISM, COGNITIVE ENHANCEMENT AND AI: special issue of *Minds and Machines*, deadline 15 January.

EMPIRICAL EVALUATIONS IN REINFORCEMENT LEARNING: special issue of *Machine Learning*, deadline 26 February.

THE METHODS OF APPLIED PHILOSOPHY: special issue of the *Journal of Applied Philosophy*, deadline 1 April.

THE EXTENDED MIND: special issue of *Teorema*, deadline 1 October.

EXPERIMENTAL PHILOSOPHY: Forthcoming issue of *The Monist*, deadline April 2011.

§4

WHAT'S HOT IN . . .

We are looking for columnists willing to write pieces of 100-1000 words on what's hot in particular areas of research related to reasoning, inference or method, broadly construed (e.g., Bayesian statistical inference, legal reasoning, scientific methodology). Columns should alert readers to one or two topics in the particular area that are hot that month (featuring in blog discussion, new publications, conferences etc.). If you wish to write a "What's hot in . . .?" column, either on a monthly or a one-off basis, just send an email to features@thereasoner.org with a sample first column.

... Logic and Rational Interaction

This month we published three extended reports on [Logic and Rational Interaction](#). In a patent example of collective agency, the Choice Group at the London School of Economics wrote a report on [C. Wagner's masterclass](#) on his work on consensus formation. Giacomo Sillari wrote on [three sessions of the European Philosophy of Science Association](#), all related to the themes of formal and social epistemology. Finally, Minghui Ma reported on our very own [Logic and Rational Interaction](#), the second edition of which was held in Chongqing (China).

On the publication side, [Sergei Artemov announced a working paper](#) on "knowledge-based" reasoning in games, and we linked up to [two video lectures](#), one by Artemov and one by Rohit Parikh.

You can stay in touch with loriweb.org by either registering to the [newsletter](#), or to our [RSS feed](#). Please visit the website for more details. As always, I end by reminding you that we welcome any contributions relevant to our theme, and that we are also constantly looking for new collaborators. If you would like to join the team, or if you have information to share with the broader research community, please do not hesitate to contact our web manager, [Rasmus Rendsvig](#).

Olivier Roy
Philosophy, Groningen

... Formal Epistemology

What's hot (and what's not) in formal epistemology.

Handy tips and helpful advice from the Formal Philosophy Seminar series at the Formal Epistemology Project, University of Leuven.

Hemdat Lerman argued for the contemporary relevance of the debate concerning knowledge of objects by acquaintance for the epistemology of perception. Hemdat challenged the standard representational view of experience with a *Relational* view. Here, objects and their properties are presented by perception to the observer. This relation is basic in the sense that it is not mediated by representation. The obvious issue here is how it is exactly that the relational view can account for hallucination, and it is on precisely this issue that question time concentrated on.

Albert Visser came to FEP with logic and mathematics to philosophise on. In particular, what to make of interpretations? Interpretations saturate logic and mathematics, and their ubiquity demands that we provide a substantive and maximally general theory of them. Although most general theories of interpretations fall down, there is character to be built by searching for them. Albert's definition of sameness of interpretations relates between sameness of models and sameness of theories in the following sense: each notion of sameness on models induces some notions of sameness on interpretations, and each notion of sameness of interpretations induces a notion of sameness of theories.

Aviv Hoffmann's hard-hitting talk demonstrated the incompatibility of two previously-thought-to-be compatible positions on propositions: (1) Propositions are sets of (complete and consistent and metaphysically-individuated) possible worlds, and (2) the principle of Object Dependence: the existence of singular propositions about contingent existents is ontologically dependent on those existents. Aviv's alternate view, that a proposition be identified with a *disjunction* of the (complete and consistent and metaphysically-individuated) possible worlds at which the proposition is true, avoids the reductio resulting from the combination of (1) with (2). Question time turned on (a) hyperintensionality alone gives us reason to reject (1), and (b) facts about the semantics of natural language with respect to negative existentials give us independent reasons to reject (2).

Paul Weirich's learned presentation on decision theory presented several open

problems, and invited the audience to engage in their solution. One issue is how we might go about de-idealising decision theory in order that it can deal with non-ideally rational agents. Another issue is how to generalise decision theory from mono-agent to multi-agent scenarios. The discussion touched on a large number of issues, with one general consensus being that it was most likely via game semantics that progress will be made.

Next month, Sonja Smetts and Marie Duzi!

Pics of the FPS seminars are available [here](#).

The full FPS program is available [here](#).

Sebastian Sequoiah-Grayson

Formal Epistemology Project, University of Leuven

§5

INTRODUCING . . .

In this section we introduce a selection of key terms, texts and authors connected with reasoning. Entries will be collected in a volume *Key Terms in Logic*, to be published by Continuum. If you have feedback concerning any of the items printed here, please email features@thereasoner.org with your comments.

Logic and Games

Games are situations of strategic interaction. Game theory is an applied mathematical theory that studies strategies of players in such settings. Standard game theory identifies equilibria, that is situations in which each player has adopted as a strategy a best response to his opponents. Epistemic game theory studies the role of players' beliefs and knowledge in games. There are close connections between the role of reasoning in game theory and logical reasoning, mirrored by the two ways in which logic and games connect:

Logic in Games. Logic helps to understand games by clarifying their logical structure, how the players reason about their opponents and what types of inferences they can use, for example counterfactuals. Logic can also improve game theory's analysis of the role of beliefs and knowledge in the players' reasoning. Different modal logics have been developed to formally model such problems, the most prominent being dynamic epistemic logic which builds on modal logic, epistemic logic and AGM-belief-revision to provide a logic of change of information and knowledge (van Ditmarsch et al. 2008: *Dynamic Epistemic Logic*, Springer).

Games in Logic. Logicians use so called evaluation games to determine truth values of sentences in game semantics. In such evaluation games, a semantic tree is interpreted

as a dynamic game with perfect information between a ‘verifier’ and a ‘falsifier’. A formula is true if and only if the verifier has a winning strategy. Games are also used in proof theory and model-theoretic games are employed in the foundations of mathematics, for example in forcing (Hodges 2003: [Logic and Games](#), in: *The Stanford Encyclopedia of Philosophy*).

Conrad Heilmann

Department of Philosophy, Logic and Scientific Method, LSE

Alfred North Whitehead

Alfred North Whitehead (1861–1947) was a British mathematician and philosopher. His academic career is usually divided into three stages, during each of which he made important contributions to separate areas within philosophy: 1885–1910, mathematics and logic; 1910–1924, philosophy of science; 1924–1947, metaphysics. We will focus predominantly on the first stage here.

Whitehead was appointed lecturer in mathematics at Trinity College, Cambridge, in 1885 where he was to remain for the next twenty-five years. Initially he focussed mainly on teaching and published very little. But in 1891, apparently due to the influence of his wife, he became more productive and started work on his *Treatise on Universal Algebra*, the publication of which in 1898 resulted in Whitehead’s election to the Royal Society. During this period Bertrand Russell entered Cambridge as an undergraduate. Recognising Russell’s brilliance, Whitehead secured for him a substantial fellowship and became something of a mentor to him. In around 1900, the two began one of the most celebrated collaborations within philosophy. Over the next thirteen years they worked together to produce the seminal three-volume *Principia Mathematica* (1910, 1912, 1913). The book, which is an in-depth defence of logicism conducted in light of the set-theoretical paradoxes discovered by Russell in 1901, has been massively influential, and is considered by many to be one of the greatest intellectual achievements of mankind.

Whitehead’s later work in the philosophy of science and metaphysics, conducted at Imperial College in London and Harvard University respectively, also broke new ground. In the philosophy of science, for example, he presented an alternative view to Einstein’s theory of relativity, and in metaphysics he developed the view that we ought to think of the fundamental constituents of reality as being processes rather than substance.

Ben Curtis

Philosophy, Nottingham

§6 EVENTS

DECEMBER

MS: International Conference on Modelling and Simulation in Trivandrum, Kerala, India, 1–3 December.

CONTEXT AND LEVELS OF LOCUTIONARY CONTENT: IFL, Universidade Nova de Lisboa, Lisbon, 3–4 December.

HUMAN NATURE, ARTIFICIAL NATURE: Genoa, Italy, 3–4 December.

RISK AND SOCIAL DECISIONS: LSE, 3–5 December.

MOVE: Workshop on Judgement Aggregation, Urrutia Elejalde Foundation, Barcelona, 4–16 December.

MATHEMATICAL AND SCIENTIFIC PHILOSOPHY: Indiana Philosophical Association Fall Meeting, IU Bloomington, 5–6 December.

MINDGRAD: Graduate Conference in the Philosophy of Mind, University of Warwick, 5–6 December.

EMAC: 9th Engineering Mathematics and Applications Conference, University of Adelaide, 6–9 December.

ICDM: The 9th IEEE International Conference on Data Mining, Miami, 6–9 December.

NIPS: 23rd Annual Conference on Neural Information Processing Systems, Vancouver, B.C., Canada, 7–12 December.

INTERPRETATION AND SENSE-MAKING: University of Rouen, France, 9–11 December.

NABIC: World Congress on Nature and Biologically Inspired Computing, Coimbatore, India, 9–11 December.

NEW TRENDS IN THE STUDY OF IMPLICATURES: Formal Epistemology Project, Institute of Philosophy, University of Leuven, 10–11 December.

HISTORICAL EPISTEMOLOGY: Leuven, Belgium, 10–12 December.

PSBio: Philosophical Foundations for Systems Biology, University of Oslo, 10–12 December.

EMERGENCE AND REDUCTION IN THE SCIENCES: 2nd Pittsburgh-Paris Workshop, Center for Philosophy of Science, University of Pittsburgh, 11–12 December.

INTeCH: 10th International Conference on Intelligent Technologies, Guilin, China, 12–15 December.

SUBJECTIVE BAYES: CRiSM, University of Warwick, 14–16 December.

TIGAEC: Cooperative Game Theory and Economics, Tinbergen Institute and VU University, Amsterdam, The Netherlands, 14–16 December.

FSTTCS: IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science, IIT Kanpur, India, 15–17 December.

FIT: International Conference on Frontiers of Information Technology, Abbottabad, Pakistan, 16–18 December.

SEVENTEENTH AMSTERDAM COLLOQUIUM: University of Amsterdam, 16–18 December.

EUMAS: 7th European Workshop on Multi-Agent Systems, Ayia Napa, Cyprus, 17–18 December.

MBR: Abduction, Logic, and Computational Discovery, Campinas, Brazil, 17–19 December.

ICCS: 10th Islamic Countries Conference on Statistical Sciences, New Cairo, Egypt, 20–23 December.

JANUARY 2010

ISAIM: 11th International Symposium on Artificial Intelligence and Mathematics, Fort Lauderdale, Florida, 6–8 January.

USE OF STATISTICAL SCIENCE IN DECISION MAKING: Applied Statistics Association of Sri Lanka, 8–10 January.

MIAMI GRADUATE EPISTEMOLOGY CONFERENCE: University of Miami, 14–16 January.

GRADUATE CONFERENCE ON THE PHILOSOPHY OF LOGIC AND MATHEMATICS: University of Cambridge, 16–17 January.

SODA: ACM-SIAM Symposium on Discrete Algorithms, Hyatt Regency Austin, Austin, Texas, 17–19 January.

EPISTEMOLOGY AND PHILOSOPHY OF MIND AT THE CROSSROADS: Conference of the Dutch-Flemish Association for Analytic Philosophy, Catholic University of Leuven, 20–22 January.

ICAART: International Conference on Agents and Artificial Intelligence, Valencia, Spain, 22–24 January.

ICCMS: 2nd International Conference on Computer Modeling and Simulation, Sanya, China, 22–24 January.

SOFSEM: 36th International Conference on Current Trends in Theory and Practice of Computer Science, Špindleruv Mlýn, Czech Republic, 23–29 January.

ICMSS: International Conference on Mathematical and Statistical Sciences, Cape Town, South Africa, 27–29 January.

FEBRUARY

STATISTICAL MODELLING AND INFERENCE: Conference to celebrate Murray Aitkin's 70th birthday, Brisbane, Queensland, Australia, 1–4 February.

DUBLIN INTENTIONALITY WORKSHOP: Royal Irish Academy, 4–5 February.

UTTERANCE INTERPRETATION AND COGNITIVE MODELS: Brussels, 5–7 February.

IUI: ACM International Conference on Intelligent User Interfaces, Hong Kong, China, 7–10 February.

LATTICE-VALUED LOGIC AND ITS APPLICATIONS: 31st Linz Seminar on Fuzzy Set Theory, Linz, Austria, 9–13 February.

IWCogSc: ILCI International Workshop on Cognitive Science, Donostia-San Sebastian, 10–12 February.

ICMLC: 2nd International Conference on Machine Learning and Computing, Bangalore, India, 12–13 February.

MIND IN NATURE: Humboldt-University of Berlin, 15–17 February.

LOGICAL APPROACHES TO BARRIERS IN COMPUTING AND COMPLEXITY: Alfred Krupp Wissenschaftskolleg, Greifswald, Germany, 17–20 February.

PHD'S IN LOGIC: Tilburg University, The Netherlands, 18–19 February.

AILACT: Association for Informal Logic and Critical Thinking, Central APA Meeting in Chicago, Illinois, 19 February.

ICMSSC: International Conference on Mathematics, Statistics and Scientific Computing, Penang, Malaysia, 24 February.

ONTOLOGY OF ORDINARY OBJECTS: 2nd Annual Auburn Philosophy Conference, Auburn, Alabama, 26–27 February.

BCPS: International Conference on Behavioral, Cognitive and Psychological Sciences, Singapore, 26–28 February.

MARCH

STACS: 27th International Symposium on Theoretical Aspects of Computer Science, Nancy, France, 4–6 March.

AGI: 3rd Conference on Artificial General Intelligence, Lugano, Switzerland, 5–8 March.

METHODS IN PHILOSOPHY: Dublin Graduate Conference in Philosophy, Trinity College Dublin (TCD) and University College Dublin (UCD), 6–7 March.

PHILOSOPHICAL IMPLICATIONS OF SECOND-ORDER MODAL LOGIC: International Graduate Workshop at the Centre for Logic and Language, Institute of Philosophy, University of London, 11–13 March.

THOUGHT EXPERIMENTS AND COMPUTER SIMULATIONS: SAME END, DIFFERENT MEANS?: IH-PST, Paris, France, 11–13 March.

ICKD: 2nd International Conference on Knowledge Discovery, Bali Island, Indonesia, 19–21 March.

SEP: 38th annual meeting of the Society for Exact Philosophy, Kansas City, Missouri, 19–21 March.

PROPOSITIONS, CONTEXT, AND CONSEQUENCE: Arché Research Centre, University of St Andrews, 20–21 March.

CICLING: 11th International Conference on Intelligent Text Processing and Computational Linguistics, Iasi, Romania, 21–27 March.

SW: Operational Research Society 5th Simulation Workshop, Worcestershire, England, 23–24 March.

MIDiSoVa: Modelling Interaction, Dialog, Social Choice, and Vagueness, ILLC, Amsterdam, 26–28 March.

INFOS: 7th International Conference on Informatics and Systems, Cairo University, Egypt, 28–30 March.

AISB: Annual Convention of the Society for the Study of Artificial Intelligence and Simulation of Behaviour, De Montfort University, Leicester, 29 March - 1 April.

SBP: International Conference on Social Computing, Behavioral Modeling, & Prediction, Bethesda, MD, 29 March - 1 April.

MATCHING AND MEANING: Automated Development, Evolution and Interpretation of Ontologies, Leicester, UK, 31 March - 1 April.

APRIL

THEORY OF BELIEF FUNCTIONS: Brest, France, 1–2 April.

THE SNOWBIRD WORKSHOP: The Learning Workshop, Cliff Lodge, Snowbird, Utah, 6–9 April.

JAIST: International Symposium on Integrated Uncertainty Management and Applications, Ishikawa, Japan, 9–11 April.

NEWTON AND EMPIRICISM: Center for Philosophy of Science, University of Pittsburgh, 10–11 April.

ADS: Agent-Directed Simulation Symposium, Orlando, Florida, USA, 12–15 April.

SCIENTIFIC PHILOSOPHY: PAST AND FUTURE: Tilburg University, The Netherlands, 13 April.

PROGRESS IN MEDICINE: University of Bristol, 13–15 April.

VISIONS OF COMPUTER SCIENCE: Edinburgh University, 13–16 April.

THE FUTURE OF PHILOSOPHY OF SCIENCE: Tilburg Center for Logic and Philosophy of Science, 14–16 April.

SYNTHESE CONFERENCE: Columbia University, New York, 15–16 April.

SSPP: Southern Society for Philosophy and Psychology annual meeting, Atlanta, GA, 15–17 April.

NORTHWESTERN/NOTRE DAME EPISTEMOLOGY CONFERENCE: Northwestern University, 16 April.

UNILOG: 3rd World Congress and School on Universal Logic, Lisbon, Portugal, 18–25 April.

FLOPS: 10th International Symposium on Functional and Logic Programming, Sendai, Japan, 19–21 April.

NON-CLASSICAL MATHEMATICS: a special session at World Congress on Universal Logic 2010, Lisbon, Portugal, 22–25 April.

FORMAL SEMANTICS AND PRAGMATICS: 6th International Symposium of Cognition, Logic and Communication, University of Latvia, Riga, 23–25 April.

ICCMNC: International Conference on Computer Mathematics and Natural Computing, Rome, Italy, 28–30 April.

RIAO: Adaptivity, Personalization and Fusion of Heterogeneous Information, Paris, France, 28–30 April.

SDM: SIAM Conference on Data Mining, Columbus, Ohio, 29 April - 1 May.

IGCC: 2nd annual Interdisciplinary Graduate Conference on Consciousness, Boston University, 30 April - 1 May.

REFERENCE AND REFERRING: Inland Northwest Philosophy Conference, Moscow, ID & Pullman, WA, 30 April - 2 May.

MAY

MODELS AND SIMULATIONS: University of Toronto, 7–9 May.

REASON TODAY. FROM DIFFERENTIATION TO UNITY: Babes-Bolyai University, Cluj-Napoca, Romania, 7–9 May.

KR: 12th International Conference on the Principles of Knowledge Representation and Reasoning, Toronto, Canada, 9–13 May.

AAMAS: 9th International Conference on Agents and Multi Agent Systems, Toronto, Canada, 10–14 May.

AISTATS: 13th International Conference on Artificial Intelligence and Statistics, Chia Laguna, Sardinia, Italy, 13–15 May.

NMR: Workshop on Commonsense and Non-Monotonic Reasoning for Ontologies, Sutton Place, Toronto, Canada, 14–16 May.

MEANING, MODALITY AND APRIORITY: University of Cologne, Germany, 17–20 May.

FLAIRS: 23rd Florida Artificial Intelligence Research Society Conference, Daytona Beach, Florida, 19–21 May.

IDA: 9th International Symposium on Intelligent Data Analysis, Tucson, Arizona, 19–21 May.

POBAM: Philosophy of Biology @ Madison Workshop, University of Wisconsin-Madison, 21–23 May.

PM@100: LOGIC FROM 1910 TO 1927: Bertrand Russell Research Centre, McMaster University, Hamilton, Ontario, Canada, 21–24 May.

SLACRR: 1st St. Louis Annual Conference on Reasons and Rationality, University of Missouri-St. Louis, 23–25 May.

ALGORITHMIC RANDOMNESS: Department of Mathematics, University of Notre Dame, 24–28 May.

LATA: 4th International Conference on Language and Automata Theory and Applications, Trier, Germany, 24–28 May.

ISMVL: 40th International Symposium on Multiple-Valued Logic, Barcelona, Spain, 26–28 May.

MODEL UNCERTAINTY: Centre for Research in Statistical Methodology (CRiSM), Warwick, 30 May - 1 June.

BSAP: First meeting of the Brazilian Society for Analytic Philosophy, Unisinos University, Brazil, 31 May - 2 June.

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COURSES AND PROGRAMMES

Courses

ISLA: 3rd Indian School on Logic and its Applications, University of Hyderabad, Gachibowli, India, 18–29 January.

MODERN BAYESIAN METHODS: Queensland University of Technology, Brisbane, 1 February.

ADVANCED SMALL AREA ESTIMATION: Southampton Statistical Sciences Research Institute, 15–16 February.

NASSLLI: 4th North American Summer School in Logic, Language and Information, Bloomington, Indiana, 21–25 June.

MEANING, CONTEXT, INTENTION: Central European University (CEU), Budapest, Hungary, 19–30 July.

ESSLLI: European Summer School in Logic, Language and Information, University of Copenhagen, Denmark, 9–20 August.

Programmes

HPSM: MA in the History and Philosophy of Science and Medicine, Durham University.

MASTER PROGRAMME: Philosophy of Science, Technology and Society, Enschede, the Netherlands.

MA IN METAPHYSICS, LANGUAGE, AND MIND: Department of Philosophy, University of Liverpool.

MA IN PHILOSOPHY: by research, Tilburg University.

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.

MSc IN MATHEMATICAL LOGIC AND THE THEORY OF COMPUTATION: Mathematics, University of Manchester.

MSc IN ARTIFICIAL INTELLIGENCE: Faculty of Engineering, University of Leeds.

MA IN REASONING

An interdisciplinary programme at the University of Kent, Canterbury, UK. Core modules on logical, causal, probabilistic, scientific, mathematical and machine reasoning and further modules from Philosophy, Psychology, Computing, Statistics, Social Policy, Law, Biosciences and History.

MSc IN COGNITIVE & DECISION SCIENCES: Psychology, University College London.

MSc IN COGNITIVE SCIENCE: University of Osnabrück, Germany.

MSc IN PHILOSOPHY OF SCIENCE, TECHNOLOGY AND SOCIETY: University of Twente, The Netherlands.

MASTER OF SCIENCE: Logic, Amsterdam.

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JOBS AND STUDENTSHIPS

Jobs

TENURE-TRACK POSITION: AOS: History and Philosophy of Science, Department of Philosophy at Mount Allison University, NB Canada, review begins 1 December.

ASSISTANT PROFESSOR: AOS: Philosophy of Science, Special Sciences, University of Cincinnati, Ohio, deadline 1 December.

POST-DOC RESEARCH FELLOWSHIPS: at the Linguistic Agency project of Centre for the Study of Mind in Nature, University of Oslo, deadline 1 December.

LECTURESHIP: Philosophy Of Mind And Cognition, School Of Philosophy, Psychology And Language Sciences, University of Edinburgh, deadline 4 December.

DEPARTMENTAL LECTURESHIP: AOS: epistemology, metaphysics, philosophical logic, and philosophy of language, Philosophy, University of Oxford, deadline 7 December.

PROFESSORIAL FELLOWSHIPS: Northern Institute of Philosophy, University of Aberdeen, deadline 11 December.

CHAIR IN PHILOSOPHY: University of Otago, NZ, deadline 15 December.

VISITING FELLOWSHIPS: Centre for the Philosophy of Science, University of Pittsburgh, until filled, review starts on 15 December.

VISITING FELLOWSHIP: for advanced Ph.D. students or faculty, Tilburg Center for Logic and Philosophy of Science, deadline 15 December.

POST DOCTORAL RESEARCH OFFICER: in the Templeton Project ‘God’s Order, Man’s Order and the Order of Nature’, CPNSS, LSE, deadline 16 December.

ASSISTANT PROFESSOR: AOS: Philosophy of Science or Philosophy of Social Science, Department of Philosophy and Religion, Northeastern University, Boston, MA, deadline 19 December.

POSITIONS AVAILABLE: in the field of speech and natural language processing, COE, Johns Hopkins University, Baltimore, Maryland, deadline 4 January.

ASSISTANT PROFESSOR: Philosophy of Biology and Environmental Sciences at UQAM, Montreal, Canada, deadline 5 January.

IBM HERMAN GOLDSTINE MEMORIAL POSTDOCTORAL FELLOWSHIP: for research in mathematical and computer sciences, Business Analytics and Mathematical Sciences Department of the IBM Thomas J. Watson Research Center, deadline 6 January.

THREE-YEAR FELLOWSHIP: in Philosophy, Department of Philosophy, Logic and Scientific Method and Forum for European Philosophy, LSE, deadline 8 January.

JUNIOR FELLOWSHIP: in the Neural Computation and Adaptive Perception (NCAP) program, University of British Columbia, deadline 15 January.

Studentships

PHD STUDENTSHIP: “Multilevel Search Methodologies for Problem Solving”, School of Computer Science, University of Nottingham, until filled.

PHD FELLOWSHIP: the Department of philosophy and moral sciences at Ghent University, deadline 30 December.

PHD STUDENTSHIPS: at the Gatsby Computational Neuroscience Unit, UCL, deadline 6 January.

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