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accuracy and rationality.

Richard Pettigrew is right at the fore of this buzz. His *Epistemic Utility Theory Project* has developed and employed to great effect many of the tools at the heart of this exciting new wave in epistemology. I am extremely grateful to Richard for joining us for this interview. He is Professor of Philosophy at the University of Bristol. Richard's research covers a range of topics in epistemology, decision theory, the foundations of statistics, modal logic, and the philosophy of mathematics. Our conversation today will touch on just a few of the many captivating themes from his upcoming book, *Accuracy and the Laws of Credence*.

JASON KONEK

University of Bristol

FEATURES

Interview with Richard Pettigrew

Jason Konek: Could you tell us a little about your background? Seven years ago, you were working on the foundations of finitary set theory. What led you to formal epistemology and decision theory?

Richard Pettigrew: I think actually these two things aren't as far apart as you might expect. The common link between them—something I've been interested in since I was an undergraduate—is justifying belief: everyday beliefs, scientific beliefs, mathematical beliefs, and so on. As an undergraduate, I was gripped by the problem of scepticism. I became interested in the sceptical problem surrounding *mathematical* knowledge in particular. So part of what I was interested in, in my Ph.D., was trying to figure out—on a technical level, rather than a philosophical level—just how weak you could make your assumptions about set theory in order to justify some of the basic parts of mathematics, like arithmetic and real analysis. It turns out that mathematically that's

EDITORIAL

Epistemology is buzzing at the moment. It's buzzing with the rich, engaging, inclusive research of brilliant young philosophers; work that's happening more and more often at the intersection of formal and traditional epistemology. It's buzzing about Sarah Moss's work on credal knowledge and imprecise credences. It's buzzing about Lara Buchak's work on the relationship between full belief and credence. It's buzzing about Miriam Schoenfield, Jennifer Carr, and Hilary Greaves' work on the connection between



very interesting. Set theory has a number of different places where you can put pressure on the axioms. In arithmetic, basically the only thing you can do is change the induction axiom. But in set theory you can change some of the constructive axioms, e.g., the power set axiom, the union axiom, and so on. You can also change the separation axiom, or the replacement axiom. That was the purpose of the Ph.D. work. And then after that, the philosophical work I did in philosophy of mathematics centered around defending a view of the subject matter of mathematics that tries to make the question of how we get mathematical knowledge easier: an eliminative structuralist view, which was supposed to dispel some of the worries that Paul Benacerraf had brought up about how we might actually acquire mathematical knowledge, given what our metaphysics of mathematics is supposed to be.



So all that work—the technical work in set theory, and the philosophical work about mathematics—was all around this question of justification. Then it wasn't too far to get interested in this question of justifying scientific knowledge, and therefore looking at principles of inference that we use in science, like statistical inference. But looking for the direct cause of it, it was really Jim Joyce's 1998 paper, 'A Nonpragmatic Vindication of Probabilism' (*Philosophy of Science* 65(5):575–603). I read that in my Master's year, and it just completely hooked me. It seemed like the perfect use of mathematics in philosophy. This was something I'd been thinking about throughout the Ph.D. But this seemed in some ways to me a much more interesting way to use mathematics to justify basic principles of reasoning. That got me into epistemic utility theory.

JK: Would you mind giving a broad overview of the epistemic utility programme?

RP: The programme begins with the thought that there's a notion of utility for doxastic states—things like degrees of belief or credences, or full beliefs, or comparative confidence, or imprecise credences. For any one of those things, you might reasonably think there's a way of measuring how good it is just as an epistemic state; not how good it is as at guiding action in a particular way, or how good it is because of how happy it makes the person who is in that state, but just how good it is at serving its purely epistemic purposes. So the question then is: What are those purposes? What are the goals of having these states? Once you've specified those goals, the question becomes: How might you measure how close your state comes to reaching them? And is there any reasonable way to effect that measurement mathematically? Jim Joyce's 1998 paper does make an attempt to measure the epistemic utility of doxastic states mathematically. Now, he doesn't come down with one particular measure of it. Rather, he comes down with a set of constraints that any legitimate measure must satisfy. And then he shows a particularly beautiful result using this sort of measure. I'll come back to that in a second. So that's the first part

of epistemic utility theory. The idea is that there's a way of measuring the epistemic utility of a doxastic state. The second thought is: Once you've got that, you can just apply the tools that we apply in practical decision theory to your *choice* of doxastic state. Or, if you don't like the voluntaristic connotations of talking of your choice of doxastic state is, you can re-frame the question as: which of those states are rational for you to have? So, for instance, in practical decision theory, a standard principle we might use is the Dominance Principle, which says that if you have two options, and the first one is better however the world turns out, then it is irrational to do the second one. Joyce uses that principle, but applies it to epistemic utilities, when those utilities are measuring the epistemic goodness of credences particularly. He applies that and shows that all of the non-probabilistic credence functions are irrational. So this imposes a necessary condition on rationality. It doesn't tell us anything about the sufficiency of it. But it does tell us that any credence that fails to satisfy the Kolmogorov probability axioms will be dominated in this sense—epistemic utility dominated.

So that's Joyce's initial result. And he's particularly interested in one conception of epistemic utility, namely, accuracy. So he thinks that a credence is better the closer it is to what you might think of as the omniscient credence for the proposition, viz., the credence that is maximal if the proposition is true, and minimal if the proposition is false. And that's the conception of epistemic utility that I've also been exploring myself. In the epistemic utility project that I've been pursuing the last five years, it basically takes Joyce's argument as an argument form—which specifies a way of measuring the epistemic utility of credences, and then gives a decision theoretic principle and derives an epistemic principle as a result of it—it takes that as an argument form, and it substitutes in different decision theoretic principles in place of the dominance principle that Joyce uses. Then it looks at what epistemic principles you can derive by making that substitution. So, for instance, you can get the Principal Principle, the Principle of Indifference, and various sorts of updating principles by applying different decision theoretic principles in that way.

JK: What's the normative upshot of the broad array of accuracy-centered arguments for Probabilism, Conditionalization, the Principal Principle, and so on? How should we think about the force of those arguments?

RP: I think one thing that's important about them—at least as I see them, and I think as quite a lot of people who've been working on them see them—is that they give principles of rationality, rather than norms. This might sound like a sort of philosopher's distinction without difference. But I think it's important. So these principles aren't going to say things like “You *ought* to have probabilistic credences,” or “You *should* have probabilistic credences.” But rather just “You are irrational if you have non-probabilistic credences.” Because essentially what they show is that if you fail to have probabilistic credences, you are in some way suboptimal. But that's only really going to lead to an “ought,” a claim that you should do something, if that thing that you're doing that's irrational is something that's within your volitional control; something that you might actually choose to do differently. That's something that we do assume in the case of practical decision-making. We assume that we do have some sort of

control over it. So understanding practical decision theory as giving oughts, and shoulds, and norms is reasonable. But in the case of epistemic decision theory, that seems not to be the case. The other thing to note is that a lot of their force depends on whether you think that the thing that you've used your epistemic utility function to measure is *all* of epistemic utility. So, as I said before, Joyce thought of epistemic utility as accuracy, at least in his 1998 paper. In a later paper, he walked back from that a little. But I've certainly taken the view that it's accuracy. You might however think that if accuracy is just one of the things that should go into epistemic utility, then an argument that's based only on a measure of accuracy will not be hugely forceful. It will tell you that you're suboptimal when it comes to the pursuit of accuracy. But if there's some other purely epistemic aim for beliefs out there, then it doesn't follow that you're epistemically irrational *tout court* if you're dominated in that way. Certainly for me, they have the full force that they should have because accuracy is the one true epistemic virtue. But if you didn't think that, then these sorts of arguments would have much more limited force.

JK: You are a dyed-in-the-wool epistemic value monist. You take accuracy to be the only basic epistemic good. Could you provide some sense of how this distinguishes you from other proponents of accuracy-centred epistemology, such as Jim Joyce and Branden Fitelson? Why favour your approach?

RP: There's two things that Jim has done, I think. One thing is in his 2009 paper, 'Accuracy and Coherence: Prospects for an Alethic Epistemology of Partial Belief' (Synthese 342: 263–297), he backs away from the accuracy-only approach—at least in the written work, as far as I can see—not because he had some other epistemic good in mind that he thought he should be measuring, but rather because he realised he didn't need to be monist. So, just like in the 1998 paper, he tries to put down conditions that any legitimate measure of epistemic utility should satisfy. But whereas in the 1998 paper all of those conditions were justified from an accuracy-only perspective, in the 2009 paper some of them are, but some of them are justified from much more general epistemic considerations that don't seem to have anything to do with accuracy. In particular, he has an axiom he calls Truth-Directedness, which is very much motivated by considerations of accuracy. But he also has—and it's one of the things that does a lot of the work in his final proof—an axiom called Coherent Admissibility. And that's justified not on the basis of accuracy, but on the basis of general epistemic rationality considerations.

So that's one respect in which he's backed away from epistemic value monism. But that's not a way in which he endorses some further virtue. But in later work, in response to Branden Fitelson and Kenny Easwaran's, 'An 'Evidentialist' Worry About Joyce's Argument for Probabilism' (*Dialectica* 66(3): 425–433), he takes the view that having credences that respect your evidence is also an epistemic good. And he doesn't take the view that it's entirely reducible to questions about accuracy. So he's an accuracy-first epistemologist, in the sense that he thinks that accuracy is the primary virtue; but he's not an accuracy-only epistemologist, at least not any longer. He thinks that the goal of respecting your evidence is not reducible to the goal of being accurate, but he does think that it is in some sense subservient to goal of accuracy. You could never respect your evidence but be accuracy-dominated, for instance. So accu-

racy considerations put constraints on what the evidential virtue might require of you. But he doesn't think that the evidential virtue reduces, in some way, to something that only includes the accuracy virtue. So that's the second thing that he's done in that direction. That's not to do with *measuring* epistemic utility, but is rather to do with how these epistemic utility principles apply to your evidence.

Branden Fitelson is slightly different. He also thinks that accuracy is important. Though I think it's probably not fair to call him an accuracy-first epistemologist, but rather someone who thinks accuracy is an important part of it. Instead, he thinks that principles of rationality are those ones that will be agreed upon by both considerations of evidence and by accuracy. Essentially, he tries to find a greatest lower bound on principles to which both considerations give rise (cf. Fitelson's interview in *The Reasoner*). So that's another way to incorporate considerations of evidence into this framework as well, and very successfully so. I don't take that view. That isn't to do with anything I have against evidence as a virtue. I'm open to the hypothesis it may be important to bring in respecting your evidence as an independent virtue. But what I'm trying to do at the moment is show that you don't need to do that. You can recover all the principles that you might think of as evidential principles just by looking at accuracy. So we have principles like updating by conditionalization, the Principle of Indifference, and the Principal Principle, which look like archetypal evidentialist principles. They're all to do with how you respond to evidence, and what the right credences would be in the face of certain kinds of evidence. Trying to derive those from considerations of accuracy alone will then by parsimony show that you don't need this extra virtue of respecting the evidence. So the project is not one that starts from some argument against respecting evidence, and then tries to do everything in terms of accuracy because you've shown that respecting evidence isn't an extra virtue. It's rather trying to show that everything you'd want the evidential virtue to do can be done by just considering the virtue of accuracy alone.

JK: So then are you hopeful, in a way that Jim Joyce might not be, that you can give a purely accuracy-focused rationale for the various constraints characterising reasonable measures of epistemic utility; a rationale that only adverts to considerations of accuracy, and not, e.g., to considerations of respecting one's evidence?

RP: That's right. In a book that I've been writing recently, *Accuracy and the Laws of Credence*, I try to offer an alternative justification for what has sort of become the standard constraints on epistemic utility measures. That argument was designed to do exactly that. It was supposed to be an argument that appealed only to notions of accuracy. So it didn't, like Joyce's 2009 argument, appeal to anything that might be construed as evidential principles. So yes, I am hopeful about that. I think that this particular justification is quite strong, though there are probably still ways in which it could be improved. But I think it can be done. I also think that by doing that, you don't have to make the sorts of moves that Joyce has had to make around restricting the decision principles that you use in order to derive these principles of rationality; the sorts of moves that he made in responding to Branden Fitelson and Kenny Easwaran's argument.

JK: Epistemic Utility Theory has been very fruitful over the last 20 years or so. Where do you see the research programme heading next? What are the most pressing unresolved problems?

RP: A lot of the work over the last 20 years has really been aimed at justifying particular sorts of epistemic principles, which you might think of as coherence constraints, or very general, quite formal principles. So, for example, things like the Principal Principle, Principle of Indifference, Conditionalization, and Probabilism. I think there are some leftover issues from that. So there's still this question of how you characterise the epistemic utility functions themselves; the legitimate ones. As I said, I've tried to propose a characterisation, Joyce has a proposal, and there are other ones. And people have debated what the virtues are of particular epistemic utility functions that satisfy these constraints, for various purposes, e.g., the Brier score, the power scores, the spherical score, etc. There's that sort of work. I think there's also a debate which has come to the fore recently about epistemic consequentialism quite generally. Because epistemic utility theory is essentially a brand of epistemic consequentialism, it will be interesting to see whether the objections that people like Carrie Ichikawa Jenkins, Hilary Greaves, Selim Berker, Jennifer Carr, and so on have raised to that, whether they can be answered.

So those are two leftover issues. One is a technical issue about how you do the measurements. The other one is an issue about what the normative force is of the decision theoretic principles. And the objection there is that these principles don't have the force you might think they have, because if they were to have that force, they would also justify certain seemingly outrageous constraints on epistemic rationality. So that's leftover work from the previous two decades. I also think that there's a growing sense that you can use these principles in more particular areas; less formal, general principles than the ones that have been considered. You might think about them, for instance, in the case of how peers should disagree with one another. I can see now that people might come up with a range of applications, essentially, of epistemic utility theory. At the moment, a lot of focus has been on the foundations of the project, and trying to get the basic argument for Probabilism, but then also extending it in a couple of ways to other coherence constraints. But we might move to applying it to particular serious philosophical problems, and perhaps to very particular problems of statistical inference. So you can imagine, for example, the Sleeping Beauty problem, and more generally our credences in self-locating propositions; you can imagine that would be a good area that would be open to epistemic utility theory. So that, and the peer disagreement case are two examples of the applications I have in mind. I should say that these are cases where people have done initial work (cf. Sarah Moss' 'Scoring Rules and Epistemic Compromise,' *Mind* 120(480): 1053–69; Ben Levinstein's 'With All Due Respect: The Macro-Epistemology of Disagreement,' forthcoming in *Philosophers' Imprint*; and also Brian Kierland and Bradley Monton's 'Minimizing Inaccuracy for Self-Locating Beliefs,' *Philosophy and Phenomenological Research*, 70(2): 384–95). But it hasn't been consolidated in the same way. There isn't as much literature about that yet, as there is about the other more foundational bits. It's still in its beginning stages, whereas the foundations for it are really consolidated now; in quite a mature phase. So that's kind of

where I think I see the project going next.

JK: Is there an exciting new project in the offing?

RP: One of the reasons that I've been interested in sceptical problems and the justification of certain sorts of knowledge is because we make crucial decisions on the basis of these beliefs. Unlike constructivists about decision theory, I take credences and other doxastic states to be prior to preferences; I take us to reason about, determine, and justify our preferences and in turn our choices in part on the basis of our doxastic states. So I'm keen now to move from the question of justifying doxastic states, to the question of justifying practical decisions. I think there are a number of loosely-related problems here that I'd like to think about. I've become very interested in the sorts of decisions that Edna Ullman-Margalit calls 'big decisions' and that Laurie Paul has investigated in her recent *Transformative Experience* book under the title of decisions involving 'personally transformative experiences': these are decisions in which choosing one of the available actions will lead the agent to change what she values—how does the expected utility calculation go in these cases? I'm also very interested in the sorts of questions that Elizabeth Harman has been investigating concerning how we might choose to create life—again, how does the expected utility calculation go? And, more abstractly, I'm interested in the sorts of questions that Lara Buchak has recently explored around the rationality of risk-sensitive behaviour.

NEWS

Reasoning, Argumentation, and Critical Thinking Instruction, 25–27 February

Some 60 researchers in disciplines as diverse as psychology and philosophy, cognitive and educational science, communication, rhetoric, and argumentation studies, coming from Canada, Denmark, France, Germany, Israel, Italy, Kazakhstan, the Netherlands, Poland, Sweden, the United Kingdom, and the United States, met at Lund university for the purpose of reducing the distance between research on reasoning and argumentation and what is currently taught under the heading of 'critical thinking' (CT).

Michael Weinstock (Ben Gurion University of the Negev, Israel) presented empirical evidence of lay persons' differential epistemic understanding of natural language arguments (absolutist, multiplist, and evaluativist level) as well as the role of cultural values in constructing and evaluating these, among others comparing Bedouin and Israeli samples. As he noted, empirical research on educational interventions to reliably improve such understanding remains virtually absent.

Rebecca Schendel (University College London, U.K.) reported on the challenges of using Western(ized) CT teaching and assessment instruments in African educational contexts, specifically in Rwanda. She also related evidence in support of having to adapt such materials to local (cultural) contexts, as well as a prima facie surprising finding: among her sample, only students at the architecture department—where creative work and peer-criticism thereof are standard—showed significant improvements in CT skills.

Patricia Cooke (University of Rochester, NY, USA) related the positive results of a controlled attempt at fostering CT abilities among sixth grade students whose skills in constructing and evaluating arguments improved significantly compared to a control group; this in turn had positive effects on their grades in the science curriculum. Moreover, at an age where playfulness is key, some students spontaneously concluded that the question “Does Santa exist?” is seemingly no different from “Does God exist?”

Fabio Paglieri (ISTC-CNR Rome, Italy), with **Hugo Mercier** (Université de Neuchâtel, Switzerland) and **Maarten Boudry** (Ghent University, Belgium), interpreted the alleged failure of “classical” CT instruction—viewed as a program that seeks to reform individuals’ reasoning—as a misguided attempt at improving what in fact works (fairly) well in group-contexts. He rather argued for interventions to the social environment, while noting that group “success” thus comes to depend on members’ virtues.

Jean Goodwin (Iowa State University, USA) presented the Anglo-American debate tradition as a promising educational means for improving reasoning and argumentation abilities. Unlike teacher-centered instruction, debate fosters direct and critical peer-engagement, thus teaching particularly that a burden-of-proofs—understood as a quality-guarantee for one’s discursive contribution, i.e., an accountability mechanism—must be successfully discharged before epistemically vigilant audiences.

Jean-Francois Bonnefon (CNRS Toulouse, France) presented empirical evidence of the successful dissemination of correct solutions to standardized reasoning tasks in social networks (aka “social leaning”). Full networks—where each member sees all others’ responses—proved to be conducive in factual contexts, but led to polarization towards deontic (and away from utilitarian) responses in moral reasoning tasks. Thus, the correct response spreads in such networks, while the reasons rather do not.

Moira Howes (Trent University, Canada) observed that such virtues as intellectual courage, fair-mindedness, and open-mindedness help regulate emotions in dialectical exchange, and thus foster good reasoning, and noted that emotion regulation deserves a more prominent role in CT instruction—particularly towards improving students’ ability to debias. She called for an increased cooperation among psychologist, educational scholars, and philosophers to develop suitable teaching methods.

Guillaume Beaulac (Yale University, USA), with **Tim Kenyon** (University of Waterloo, Canada), contrasted social strategies with the intuitive approach to CT instruction—viewed as the fostering of self-directed, self-disciplined, self-monitored, and self-corrective thinking—which, at base, is individualistic. Pointing to a need for socio-environmental infrastructures to make successful debiasing more probable than it currently is, they provided a range of examples where such strategies have already proved useful.

Gabor Tahin (Downside School, Bath, UK) presented an analysis of Cicero’s “On Pompey’s Command,” which particularly instantiates the “heuremes” of temporal sequencing and representativeness, as an example of a teaching program in heuristic rhetoric. Since classical texts continue to serve as models for the strategic and persuasive use of argumentative language, he argued, they remain well-suited to teach how contemporary political actors (fail to) manage the uncertainty of the rhetorical situation.

Kelvin Authenrieth (Independent Scholar, Leipzig, Germany), with **Ulrich Wechselberger** (University of Koblenz, Germany), presented video games as a resource to train and apply such CT skills as hypothesis-generation and -testing, or theory-crafting. If games are “done right,” the immersed motivational state that users tend to experience (aka “flow”) can be harnessed not only towards improving motor skills, but also for higher-level cognitive abilities. At the same time, a formula for “getting it right” is unknown.

Robert Ennis (University of Illinois, USA) laid out a detailed proposal on what in terms of knowledge, know-how, teaching and assessment instruments, but also institutional support structures, remains wanting at universities before high hopes in successfully implementing ‘CT across the curriculum’ would be deserved. Especially philosophy departments—that presently tend to provide CT courses—find vast growth opportunities, and should therefore take their role in CT instruction more seriously.

Ulrike Hahn (Birkbeck, London, UK) demonstrated the Bayesian approach, which particularly provides a normatively adequate and empirically (partially) corroborated account of such fallacies as *ad ignorantiam*, *slippery slope*, *ad ignorantiam*, etc., as a potential avenue for CT instruction. Criticizing the Toulmin model as being normatively empty, and the argument-scheme collection as unsystematic and lacking motivated evaluative norms, Bayesian belief networks were shown to remedy these defects.

Mariusz Urbanski, with **Katarzyna Paluszkiwicz** and **Joanna Urbanska** (Adam Mickiewicz University, Poland), presented empirical evidence on the correlation between levels of fluid intelligence and performance on simple or difficult deductions—operationalized as syllogistic or erotetic reasoning tasks—and the impact of logic instruction on performance. Fluid intelligence proved to be a minor factor for both kinds of deductions, while logic instruction was more important for difficult tasks. Based on verbatim protocols, moreover, they developed erotetic modes of participants’ (suboptimal) reasoning.

Frank Zenker, **Christian Dahmann**, and **Farhan Sarvar** (Lund University, Sweden) provided an analytical overview of the experimental elements and typical response patterns which underwrite the diagnosis that reasoning in various contexts is prone to biases, and hence in need of ameliorative interventions. Their review of research in legal contexts suggests that extant techniques broadly fail to address all relevant aspects of motivation, cognition, and technology required to achieve a debiasing effect.

Clarence Sheffield Jr. (Rochester Institute of Technology, USA), Eugene Fram Chair in Applied Critical Thinking, related successes and pitfalls in implementing CT across the curriculum. While CT instruction remains a top-priority area for students, educators, and employers that is worth millions of dollars annually, he criticized CT research and its praxis as a variegated conglomerate which often lacks rigor, and whose importance too often remains incompletely understood by faculty and administrators.

Selected papers from RACT 2015 are expected in 2016 as a special issue of *Topoi*, for which an [open call for papers](#) (deadline 30 October, 2015) has been announced. The organiser acknowledges the support of the Swedish Research Council, the Grace and Philip Sandblom Fond, the Elisabeth Rausing Foundation Memorial Fund, the Association for Informal Logic and Critical Thinking, the Lund University Information Quality Re-

search Group, and the Lund University Research Group on Law Evidence and Cognition.

FRANK ZENKER
Lund University

Calls for Papers

SOCIAL COGNITION: special issue of *Perspectives: International Postgraduate Journal of Philosophy*, deadline 30 May.

INDUCTIVE STATISTICAL METHODS: special issue of *Entropy*, deadline 31 May.

CRITIQUING TECHNOLOGIES OF THE MIND: special issue of *Phenomenology and the Cognitive Sciences*, deadline 30 June.

LOGIC THEOREMS: special issue of *Logica Universalis*, deadline 31 July.

REASONING, ARGUMENTATION, AND CRITICAL THINKING INSTRUCTION: special issue of *Topoi*, deadline 30 October.

WHAT'S HOT IN . . .

Uncertain Reasoning

The relation between probability and truth is an intriguing one. A moment's reflection is enough to convince us that we can be entirely sure about something being the case and yet, be completely wrong about it—as Othello turned out to be about the infamous handkerchief. Whilst this seems to mark a clear cut distinction between what's probable and what's true, things get quickly confusing when *degrees* of probability are contrasted with *degrees* of truth. For many fail to see any real distinction between the two notions. Thus, for example, de Finetti opens his paper “The logic of probability” (as translated in *Philosophical Studies* 77 181-190, 1995):



There is no possible doubt, after the beautiful research of Lukasiewicz, Reichenbach, Mazurkiewicz et al., that the calculus of probability can be considered as a many-valued logic (precisely: a continuous scale of values), and that this point of view is the best one for elucidating the fundamental concept and logic of probability.

The paper then elaborates on the distinction between logic and probability which paves the way to the subjectivist theory for which de Finetti is very well-known. In his account of the topic, de Finetti never entertains the hypothesis that logic (rather than probability) may itself stretch beyond “true” and “false”, or to put it another way, that degrees of probability over events whose logic admitted degrees of truth could be meaningfully investigated.

Despite very recent efforts, the question of grounding probability on a many-valued logic of events rests, to date, on relatively uncharted territory. I think (as one of the authors who are trying their hand at this intriguing but very hard question) that an important part of the explanation as to why this is indeed the case comes from the fact many-valued logics tend to be under-appreciated in a number of areas. These include statistics—where talk of bounded-random variables often replaces the logic of many-valued events—and epistemology—where hard-to-grasp questions about vagueness tend to relegate the relevance of established mathematical results on many-valued logics to the background.

As a consequence I warmly welcome the newly published (5th March 2015) revised edition of Siegfried Gottwald's entry [Many-valued Logics](#) on the Stanford Encyclopaedia of Philosophy. The entry takes the reader immediately to the key questions which are addressed, as usual with Gottwald, tersely and concisely. Hence in remarkably little space, the reader is introduced to the main lines of developments of the field of many-valued logics, their many interpretations (including the not-so-well-known betting interpretation of Giles's) and applications. The list of recommended readings completes the entry by pointing to the key references in the field.

HYKEL HOSNI

Marie Curie Fellow,
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Evidence-Based Medicine

In epistemology there has been discussion of a distinction between having a justification and having a good excuse. On one view, one is justified in believing a proposition only if that proposition follows from one's body of evidence. On such a view, even if one's body of evidence strongly suggests a proposition without entailing it, one is not justified in believing that proposition, although here one seems to have a good excuse for believing the proposition since one's evidence just happens to be radically misleading. On the other hand, on this view, if in fact one's body of evidence entails a certain proposition and one does not believe the proposition, then one's disbelief is unjustified. Once again, however, one may have a good excuse for this disbelief. In this case, one has the evidence required for justified belief but one does not seem to be responding to one's body of evidence in the appropriate way, where this inappropriateness may or may not be excusable.

Last month saw the publication of [an interesting letter](#). Sometimes current medical practice turns out to be inferior to previous practice, so that the evidence is in favour of so-called medical reversal. The authors of this letter compared the responses of specialist societies to the response of journals in the face of evidence for reversal of medical practice. They conclude that “[s]pecialist societies are moderately resistant to medical reversal”. In particular, they say that “journal responses were less resistant to changing practice and specialist societies' resistance to reversal was related to the importance of the reversed practice to members of the responding society”.

Let us grant that the above account of justification and excuses is correct, and that indeed there is some case in which medical reversal is justified although a relevant specialist society is resistant to this reversal. The question then becomes: in this case is there a good excuse for this resistance to medical reversal, even though such resistance is unjustified? The authors

of the letter suggest that there may not be a good excuse. For example, they suggest that commercial conflicts within specialist societies may contribute to their resistance to medical reversal. I am reminded of an old joke about a man who goes to see a chiropractor. The chiropractor tells him: "I'll need to see you three times a week... until my yacht is paid off".

MICHAEL WILDE
Philosophy, Kent

P-VALUE	INTERPRETATION
0.001	HIGHLY SIGNIFICANT
0.01	
0.02	
0.03	
0.04	SIGNIFICANT
0.049	
0.050	OH CRAP. REDO CALCULATIONS.
0.051	ON THE EDGE OF SIGNIFICANCE
0.06	
0.07	HIGHLY SUGGESTIVE, SIGNIFICANT AT THE P<0.10 LEVEL
0.08	
0.09	
0.099	HEY, LOOK AT THIS INTERESTING SUBGROUP ANALYSIS
≥0.1	

xkcd.com

EVENTS

APRIL

- L & R:** Congress on Logic and Religion, Brazil, 1–5 April.
CCES: Causality & Causal Explanation in the Sciences, University of Cologne, 10 April.
SHF: Statistics with a Human Face, Queen's University of Belfast, 15 April.
CI: Causal Inference Meeting, University of Bristol, 15–17 April.
TPLP: Truth, Pluralism & Logical Pluralism, University of Connecticut, 17–19 April.
PROGIC: The 7th Workshop on Combining Probability and Logic, University of Kent, 22–24 April.
PL: Conference in philosophy and Logic, University of Belgrade, 24–26 April.

MAY

- FWPS:** Mangoletsi Lectures: Freedom of the Will and the Perils of Scientism, University of Leeds, 5–13 May.
E & A: Explanation and Abduction: Logico-Philosophical Perspective, Ghent University, 7–8 May.
EoM: Epistemology of Metaphysics Workshop, University of Helsinki, 8–9 May.
DT: Decision Theory Workshop, University of Cambridge, 13–19 May.
OSM: Masterclass: Objectivity, Space and Mind, London, 14–15 May.

SLACRR: St. Louis Annual Conference on Reasons and Rationality, Moonrise Hotel / Washington University in St. Louis, MO, 17–19 May.

TIoP: The Idea of Pragmatism, University of Sheffield, 18–19 May.

TAMC: Theory and Applications of Models of Computation, School of Computing, National University of Singapore, 18–20 May.

MR: Metacognition and Reasoning, Dubrovnik, Croatia. 21–23 May

TRUTH AND GROUNDS: Mount Truth, Ascona, Switzerland, 24–29 May.

CD: Compromise and Disagreement, University of Copenhagen. 27–29 May

TOFB: The Odds for Bayesianism, University of Vienna, 28–30 May.

JUNE

ICCS: International Conference on Computational Science, Reykjavik, Iceland, 1–3 June.

TTL: 4th International Congress on Tools for Teaching Logic, Rennes, France, 1–4 June.

ECA: Argumentation and Reasoned Action, Lisbon, Portugal, 9–12 June.

HPTL: Hilberts Epsilon and Tau in Logic: Informatics and Linguistics, University of Montpellier, 10 June.

SEL: Studying Evidence in the Law: Formal, Computational and Philosophical Methods, University of San Diego, 12 June.

TSC: Towards a Science of Consciousness, Helsinki, 9–13 June.

MR: Meaning & Reference, University of Bucharest, 19–21 June.

UNILOG: 5th World Conference on Universal Logic, Istanbul, 25–30 June.

LA: Legal Argumentation, Rotterdam, 26 June.

CMS: Causality and Modeling in the Sciences, Madrid, 29 June–1 July.

COURSES AND PROGRAMMES

Courses

- COMBINING PROBABILITY AND LOGIC:** University of Kent, 20–21 April.
EPICENTER: Spring Course in Epistemic Game Theory, Maastricht University, 8–19 June.
EPICENTER: Mini-course on Games with Unawareness, Maastricht University, 22–23 June.

Programmes

- APHIL:** MA/PhD in Analytic Philosophy, University of Barcelona.
MASTER PROGRAMME: MA in Pure and Applied Logic, 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.

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, SCIENCE AND SOCIETY: TiLPS, 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 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.

MA IN REASONING

A programme at the University of Kent, Canterbury, UK. Gain the philosophical background required for a PhD in this area.

Optional modules available from Psychology, Computing, Statistics, Social Policy, Law, Biosciences and History.

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

MSC IN COGNITIVE SYSTEMS: Language, Learning, and Reasoning, University of Potsdam.

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 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 Sebastián).

OPEN MIND: International School of Advanced Studies in Cognitive Sciences, University of Bucharest.

JOBS AND STUDENTSHIPS

Jobs

ASSOCIATE PROFESSORSHIP: in Philosophy/Logic, Los Rios Community College, deadline 6 April.

LECTURER: in post-Kantian German philosophy, Royal Holloway, University of London, deadline 17 April.

POST DOC: in Philosophical Logic, University of Melbourne, deadline 19 April.

POST DOC: in Logic, Language, and Metaphysics, University of Southampton, deadline 27 April.

Studentships

PHD POSITION: in Bayesian Statistics, Durham University, deadline 10 April.

PHD POSITION: in Theoretical Philosophy, Stockholm University, deadline 15 April.

PHD POSITION: Simulation and Counterfactual Reasoning in Neuroscience, University of Geneva, deadline 21 April.

DISSERTATION PRIZE: in Logic, Language, and Information, deadline 27 April.

