

BPSW 2023 abstracts

- Cyrille Imbert (Archives Poincaré, CNRS, Université de Lorraine): **The Cognitive and Social Process of Computing Pseudo-Random Numbers for Scientific Applications: Ingredients for a Reliability Crisis**

Various social and cognitive factors may affect the reliability of mathematical practices. Here, I focus on the issue of the generation of pseudo-random numbers. Gargantuan amounts of them are increasingly used across science. Whereas scientists have developed excellent random number generators over the decades, like the Mersenne Twister, strong evidence can be found that many computational results may be invalid because of the pseudo-random numbers they rely upon. How deep and pervasive this problem is and whether we face a rampant randomness crisis constitute a million-dollar question.

- Elena Popa (Jagiellonian University, Krakow): **Causality, Evidence, and Local Psychiatric Knowledge: A Case for Pluralism**

Global initiatives in psychiatry have typically been in tension with local interventions and conceptualizations of mental illness. This is perhaps best illustrated by evidence-based interventions being typically tested through methods such as randomized controlled trials, while the effectiveness of local approaches is usually studied by medical anthropologists using qualitative interviews or ethnography. This paper aims to sketch out a way of resolving this tension by expanding the scope of evidence and causality to include local psychiatric knowledge. I will argue that employing mixed methods alongside pluralism about causal concepts can help formulate and test causal claims involving local psychiatric approaches.

- Henrik Røed Sherling (Cambridge) & Benjamin Chin-Yee (Cambridge): **Clinical Communication: A Model for Scientific Assertion?**

How should scientists communicate with policymakers? Schroeder (2022) recently proposed the informed decision-making framework (IDM) for policy advising which proposes that scientists, like clinicians, should tailor their assertions to the values of their audiences. In this paper, we argue against the IDM and develop an alternative, the presuppositional framework, wherein a communicative act aims to answer a question under discussion and presupposes a common ground between speaker and audience. We apply this framework to re-evaluate key cases of scientific policy advising, showing that it provides a novel, simple, and explanatorily powerful approach to ethical analysis of scientific communication.

- Benedetta Spigola (Lisbon): **What is it like to be a conservation law? Between laws and principles**

In this paper I will address the ambiguous nature of conservation laws using a structuralist approach. There is no general agreement on whether conservation laws are to be considered physical laws or physical principles. The philosophical debate has

focused on the status of necessity that is normally attached to them (e.g., degree of necessity, or species of necessity). I aim to shed light on the nature of conservation laws by referring to an unduly neglected perspective on the question of what general structure physical theories should have. In this view, every physical proposition has specific structural properties that determine its status and function in a physical theory. This approach can clarify the nature of conservation laws by reflecting on whether they have structural properties of laws or structural properties of principles.

- Andrei Marasoiu (Bucharest): **Representation and design in network models of category deficits**

Is semantic memory amodal, independent of its sensory origins? Call “rationalists” those who argue it is, unlike concept empiricists, for whom semantic memory depends on cross modal sensory integration. I discuss category deficits, exhibited by patients who lose mastery of only some concepts, e.g., animate or inanimate ones. Concept loss has multiple models: clinical, computational, cognitive-psychological. Yet neural networks that simulate category deficits don’t provide a principled way to distinguish realist representationalist assumptions (about human memory) from design assumptions aimed at simplicity or ease of use. Sometimes lacking criteria to differentiate representation from design features undermines, I argue, rationalism and empiricism.

- Sam Schindler (Aarhus): **Two types of discovery: Nobel meets Kuhn**

Traditionally, philosophers of science have associated discovery with the discovery of ideas; the discovery of objects has been a largely neglected topic. It has also largely been unnoticed that Kuhn made a significant contribution to this topic. In this talk I will review and defend the distinction Kuhn drew between two types of discovery of objects, which I have elsewhere called “that-what” and “what-that” discoveries (Schindler 2015). I will also present a new analysis of the Nobel prizes in physics of the last 50 years, demonstrating the usefulness of the distinction.

- Veli-Pekka Parkkinen (Bergen): **Unique identifiability assumptions in methods and philosophy of causal enquiry**

I argue that most if not all causal inference methods make independence assumptions that amount to assuming that the variables of interest are embedded in a causal structure that is in principle identifiable from evidence of association alone, without causal assumptions. I then show that many philosophical theories of causality involve similar assumptions, implying that such independencies must be present in every causal structure, for the world to have a determinate causal structure in the first place. This is unrealistic. I suggest that such assumptions regiment the construction of variable sets suitable for causal analysis, and it makes little sense to consider the structure of the whole world as a unit of such analysis.

- Rose Trappes (Exeter): **Behavior as Disposition or Interaction**

Behavior is a key object of scientific research. But what exactly is behaviour, and how should researchers conceptualize and study it? One of the few philosophers of science to address this question is Helen Longino (Muszynski and Malaterre 2020). Longino highlights how behavioral scientists typically investigate behaviour as a disposition (Longino 2013; 2021). Aggression, for instance, is treated as the disposition to react aggressively to certain stimuli (Kaiser and Müller 2021). Longino argues that dispositionalism is problematically individualist and internalist. She proposes interactionism as an alternative: treating social behaviour as an interaction between active partners. In this paper, I argue that dispositionalism isn't inherently individualist and internalist, using examples from behavioral biology and philosophical literature on dispositions. This helps identify what is distinctive about interactionism: interactions are occurrent events, not persistent properties. Interactionism's focus on events generates different demands for how to measure and explain behaviour. This means interactionism does contribute to the epistemic pluralism for which Longino advocates, just not in all the ways she initially suggested.

- Johannes Nyström (Stockholm): **Predictive success and theoretical stability: on the soundness of the two-variable no-miracles argument**

Sprenger and Hartmann (2019) argue that assessing the stability of a scientific theory over time significantly improves the 'no-miracles argument' (NMA) for scientific realism in favour of the realist by liberating its persuasiveness from realist-leaning priors. They defend this claim on the basis of a formal Bayesian model. I argue that their most important assumption, distributing the conditional probability of theoretical stability, cannot be justified. Therefore, their argument is not sound. My argument leads to a general constraint on such probability distributions. Under this constraint, the argument can again only be persuasive if you are already a scientific realist. (Ref. Sprenger and Hartmann (2019), Bayesian Philosophy of Science, Oxford University Press)

- Lorenzo Casini (Lucca/LMU): **High-level Causation and Causal Inference** (w/ A. Moneta)

Experimental methods for causal inference (e.g., randomized trials) are believed to conclusively identify causation in virtue of realizing ideal conditions, as formulated by Woodward's interventionism, that avoid confounding. We observe that many high-level (aggregate) variables have potentially ambiguous effects on other variables due to their heterogeneous causal role in the population of interest. We argue that, when experiments are used to establish causation among such heterogeneous variables, they provide a much weaker inferential leverage, such that interventionism cannot adequately rationalize the inference to high-level causation. Assuming that causal inference may be warranted in such contexts, the problem arises of how exactly it should be justified. As an alternative to interventionism, we propose an abductive rationalization of causal inference.

- Daniel Kostic (Leiden): **Pragmatics for Explainable AI**

Choosing one over the other explainability norm in different opacity contexts is question begging in the absence of the relevance criteria. I aim to fill this gap by providing a narrow and a general pragmatic account of explainability relevance. The narrow account is mainly concerned with explanations whose explanatory power is fueled, not hampered, by the complexity of the system. Given that the fruitful explainability norms are not always tied to explanations, but to other epistemic and non-epistemic goals as well, the general account uses a series of simple erotetic arguments to narrow down the relevant set of explainability norms in different opacity contexts.

- Aditya Jha (Cambridge): **On the continuum fallacy: is temperature a continuous function?**

It is widely believed that continuity is essential for many accounts of scientific representation, explanation and understanding because continuum models are decoupled from the microscopic details of the modelled physical system. Accordingly, there is a commonly held (mis)conception that temperature varying across a region of space or time can always be accurately represented as a continuous function. By focusing on various anomalous cases of temperature discontinuities, I show that the continuum view is fallacious on the ground that the microscopic details of a physical system are not necessarily decoupled from continuum models and how discontinuum models may have greater empirical adequacy and explanatory power in several contexts.