Workshop on Interventionism and Non-Causal Dependence

Venue:
UFR de philosophie, Université Paris 1 Panthéon-Sorbonne
IHPST, salle de conférence
13 rue du Four 75006
Paris, France

Thursday, March 12

8:50 – Welcome and introduction
9:00 – **Michael Baumgartner (University of Bergen)**, "*The Prospect of Avoiding Interventionist Exclusion by Variable Set Pruning"*
10:00 – **Alexander Gebharter (Marche Polytechnic University) & Zhitao Zhang (Marche Polytechnic University)**, "*Causal Models and Interventions for Multi-Level Systems*" 11:00 – Short break
11:15 – **Lorenzo Casini (University of Bologna)**,*"Realization Independence and the Epiphenomenalist Revenge"*
12:15 – Lunch
14:30 – **James Woodward (University of Pittsburgh, Emeritus),** "*Interventionism and Non-Causal Dependency Relations*" 15:30 – **Max Kistler (Université Paris 1 Panthéon-Sorbonne)**, "*Integrating Constitution into Causal Models*"
16:30 – Short break
16:45 – **Thomas Kroedel (University of Hamburg) & Thomas Blanchard (Université Bordeaux Montaigne),** "*Causal Complications for Explainable AI*"
17:45 – **Bram Vaassen (Umeå University):** "*No, but Really, What Is So Bad About Overdetermination?*"
18:45 – End of day
19:30 – Conference dinner

Friday, March 13

9:00 – **Stephan Leuenberger (University of Glasgow),** "*Exclusion and the Variety of Apt Models*"
10:00 – **Vera Hoffmann-Kolss (University of Bern)**, "*Problems of Collective Action: Interventionism Meets Supervaluationism*"
11:00 – Short break
11:15 – **Toby Friend (SUNY Buffalo)**,*"Just Cause: The Only Criterion for Intervention?"*
12:15 – Lunch
14:30 – **Jennifer McDonald (Columbia University, New York)**, "*Causal Distinctness for Extrinsic Relata*"
15:30 – **Samuel Lee (University of Hamburg),** "*High-Level Causation: Threading the Needle*"
16:30 – Short break
16:45 – **Ken Aizawa (Rutgers University, Newark)**, *"Compositional Abduction and NonCausal Dependence"*
17:45 – **Brian Ortmann (University of Hamburg),** "*Spurious Versus Genuine High-Level Causes: Can Interventionism Capture High-Level Causes?*" 18:45 – End of workshop

ABSTRACTS

Kenneth Aizawa (Rutgers University, Newark): "Compositional Abduction and NonCausal Dependence"

How do scientists confirm or disconfirm hypotheses regarding non-causal dependence? In the first part of the talk, I sketch a theory of compositional abduction that I think characterizes what is going on in four historical cases. In the second part, I indicate how my theory of compositional abduction differs from some familiar versions of inference to the best explanation.

Michael Baumgartner (University of Bergen), "The Prospect of Avoiding Interventionist Exclusion by Variable Set Pruning"

Ever since the debate on interventionist causal exclusion began, a frequently adopted strategy to reconcile non-reductive physicalism with interventionism has been to impose constraints on modeled variable sets, to the effect that the interventionist machinery must only be applied to variable sets that are free of supervenience relations. The idea is that exclusion arguments rely on variable sets that must be suitably pruned prior to interventionist modeling. Once all supervenience relations are eliminated, exclusion worries dissolve--or so it is claimed by, e.g., Eronen (2012, 2014), Polger et al. (2018), Stern & Eva (2023), and Weslake (2024). In this talk, I critically assess this pruning strategy. Pruning a modeled variable set V only stops a classical interventionist exclusion argument if accompanied by a notion of intervention that is relativized to V. Relativizing the notion of intervention to V, in turn, requires that certain aptness conditions are imposed on V, in particular, that V satisfies Causal Sufficiency. I show that satisfying Causal Sufficiency in pruned variable sets is far more demanding than is currently recognized in the literature. Moreover, I argue that, in a pruned variable set that truly satisfies Causal Sufficiency, it is not possible to intervene on a macro-level variable in such a way that downstream variables change while all off-path variables are held fixed. I conclude that the prospects of avoiding interventionist exclusion through variable set pruning are very dim.

Lorenzo Casini (University of Bologna): "Realization Independence and the Epiphenomenalist Revenge" (joint work with Alexander Gebharter)

For two decades, James Woodward has defended mental causation against epiphenomenalism using interventionism. Recently, he introduced a "realization independence" condition to address an underdetermination charge raised by Michael Baumgartner. If successful, this proposal would promise a resolution of a longstanding metaphysical debate via ideal experimental evidence. We argue that the proposal faces a dilemma: either it contradicts core interventionist commitments and yields absurd consequences, or it fails to escape the underdetermination charge. The most plausible resolution is what we call the epiphenomenalist revenge: abandoning mental causation. More generally, our argument challenges the claim that the mental causation problem can be resolved on purely evidence-based grounds.

Toby Friend (SUNY Buffalo): "Just Cause: The Only Criterion for Intervention?"

This presentation defends an interventionist theory of causation employing streamlined criteria for intervention. A previously defended Modified Interventionist Theory (MIT) requires only that an intervention (i) be a cause of its target with respect to some candidate effect, and (ii) not

directly cause the effect. After rehearsing the case for MIT, I propose further streamlining by removing the second criterion. I present examples showing that interventions can be probative even if they causally influence the candidate effect. Finally, I argue that this additional simplification allows interventionism to probe possible causal relations between constitutively related variables.

Alexander Gebharter (Marche Polytechnic University) & Zhitao Zhang (Marche Polytechnic University): "Causal Models and Interventions for Multi-Level Systems"

How to adequately model causation in systems spanning more than one level, and how interventions into such systems operate, are lively debated topics in both metaphysics and the philosophy of science. Despite this lively debate, no systematic account for computing postobservation and post-intervention probabilities in multi-level systems currently exists. We close this gap by developing such an account that acknowledges the most important intuitions about multi-level systems while remaining neutral with respect to broader metaphysical controversies.

Vera Hoffmann-Kolss (University of Bern): "Problems of Collective Action: Interventionism Meets Supervaluationism"

Cases in which many agents contribute to an outcome, such as voting scenarios or scenarios where individuals contribute to climate change, present challenges for difference-making theories of causation. One problem is that, in such cases, individual actions often do not make a difference for the effect. A second problem is that there are cases in which it is indeterminate if individual actions are difference-makers. In this paper, I argue that, while interventionism can address the first problem, it is challenged by the second. I then propose combining interventionism with the conceptual tools of supervaluationism, as found in the debate on vagueness, as a solution to this problem. Finally, I conclude by exploring whether this extension of interventionism can help address cases of multi-level causation, particularly the three-judges case recently discussed by Blanchard.

Max Kistler (Université Paris 1 Panthéon-Sorbonne): "Integrating Constitution into Causal Models"

According to Craver (2007), constitutive relevance can be discovered by mutual manipulability. However, the requirements on interventions make mutual manipulability of mechanisms and their constituents impossible. Both Baumgartner and Casini's "no-decoupling" account and Craver, Glennan, and Povich's analysis of constitutive relevance as "causal betweenness" take into account the fact that constitution, a non-causal dependence relation, cannot be analyzed as difference-making of the same sort as causation. However, none provides a complete analysis of the scientific construction of models of mechanisms with constituents at different layers. It is possible to construct models of multi-level mechanisms representing constitution although the relevant experiments directly provide only information on causal relations, because causal information can bear on variables at different levels. Multi-level models can be built in two steps: (1) partial purely causal models are built for each hypothetical constituent variable on the basis of top-down and bottom-up experiments; (2) these partial models are merged into a comprehensive model containing both causal and constitution relations based on level information and spatio-temporal constraints.

Thomas Kroedel (University of Hamburg) and Thomas Blanchard (Université Bordeaux Montaigne): "Causal Complications for Explainable AI"

How can we explain the behaviour of AI agents such as large language models? A prominent approach appeals to the interventionist theory of causation. On this view, explaining a system's behaviour amounts to identifying its internal representations and establishing their causal roles by examining how (actual or hypothetical) interventions on them would affect the system's outputs. However, the nature of these representations gives rise to significant challenges for this strategy. As a result, standard interventionist tests can yield misleading verdicts about the causal roles of these states. We examine two potential fixes, reject one of them, and suggest that the other may provide a promising solution.

Samuel Lee (University of Hamburg), "Multi-Level Causation: Threading the Needle"

Interventionist accounts of high-level causation face a dilemma. Standard principles for controlling confounding create a tension between causes at different levels: strict adherence compels us to exclude high-level causes to preserve the low-level causes guaranteed by the completeness of physics (Baumgartner 2009), while relaxing these controls invites spurious, parasitic high-level causal relations. To resolve this, I propose a conservative amendment to Woodward's (2003) theory. The core innovation is a revised definition of *intervention* that distinguishes between transmissive and nontransmissive paths. I argue that variables linked by noncausal, vertical determination act as confounders only when they lie on transmissive paths. This framework successfully threads the needle: it validates genuine high-level causal relations (avoiding undergeneration) without validating spurious correlations (avoiding overgeneration). Finally, I apply this approach to Kim's (1998) causal exclusion problem. I argue that a lower-level variable and the higher-level variable it underlies do not overdetermine their common effect. Instead, because the only transmissive path from the lower level to the effect runs *through* the higher level, the relationship is akin to the multiple causation found in a causal chain.

Stephan Leuenberger (University of Glasgow): "Exclusion and the Variety of Apt Models"

To ensure that our theory does not count a variable as its own cause, or the cause of some conceptually related variable, it is tempting to impose the constraint on an appropriate or apt causal model that all its variables be metaphysically independent. However, this thought leads to the familiar problem that metaphysically related causes exclude each other. A promising approach is to allow that metaphysically dependent variables may both be causes even though no single apt model represents them as such. The talk explores and evaluates different logics of causation that arise from this proposal.

Jennifer McDonald (Columbia University, New York) Causal Distinctness for Extrinsic Relata

The relata of causal dependence, qua causal relata, are independent of each other aka. 'distinct'. This feature plays a key role in differentiating causal from *metaphysical* dependence – dependence underwritten by mereology, functional realization, determinable/determinate hierarchies, etc. But what exactly constitutes causal distinctness? A mere negative stipulation, that causal distinctness is satisfied just in case relata don't stand in any metaphysical dependence relation, is just a placeholder. Yet, as I argue, all extant accounts of distinctness fail

in the face of certain extrinsic properties – such as being married, being an invasive species, or being one meter long.

In response, I propose a friendly amendment to extant theories that renders them adequate to extrinsic properties. I argue that distinctness involves consideration of *preconditions* – an ontic analogue of presuppositions. An event, *e*, is a precondition of *f* just in case *e* occurs in every world where *f* occurs *or* ~*f* occurs. Then, on an amended, preconditional account, *e* must continue to be distinct from *f* even when holding fixed each of *f*'s preconditions. Along the way, I take a stand on what it means to 'negate' an event, drawing lessons from how causal models represent.

Brian Ortmann (University of Hamburg): "Spurious Versus Genuine High-Level Causes: Can Interventionism Capture High-Level Causes?"

This paper evaluates whether interventionism can adequately capture high-level causation. After presenting Woodward's (2003) theory and Baumgartner's interventionist exclusion argument, I argue that standard interventionism faces serious difficulties with high-level causes. Woodward's (2015) revision solves only some problems and misclassifies spurious causes as genuine. Zhong's (2020) account classifies them correctly but entails the inertness of realisers of efficacious high-level variables. Woodward's (2022) synthesis improves matters but still yields counterintuitive results and reintroduces Kim's exclusion problem. I conclude that interventionism cannot accurately capture high-level causes, either extensionally or intensionally.

Bram Vaassen (Umeå University): "No, but Really, What Is So Bad About Overdetermination?"

Non-reductionist positions are often thought to entail widespread overdetermination. Some respond that if the relevant causes stand in tight non-causal dependence relations, such "benign" overdetermination need not be metaphysically costly. Thus, composite objects and mental, aesthetic, or moral properties might count as causes without problematic overdetermination. However, Zhong has revised interventionist accounts to avoid systematic overdetermination. I argue that properly understood difference-making accounts of causation undermine motivations for rejecting systematic benign overdetermination. What remains is at most a verbal dispute about which correlations to label "causal."

James Woodward (University of Pittsburgh, Emeritus): "Interventionism and NonCausal Dependency Relations"

This talk assumes that there are non-causal explanations (and associated non-causal dependency relations) in science, as well as causal explanations. It argues that an interventionist framework can help, in some cases, capture the causal/non-causal distinction and, when appropriately extended, provide insight into how certain non-causal explanations work. Two key features of causal claims are that interventions must be possible and that cause and effect variables satisfy a distinctness condition. In some cases, dependency relations exist where we can meaningfully consider how one variable would differ if another were different, yet these conditions are not

satisfied. This provides a way to draw the causal/non-causal boundary while retaining the core interventionist insight that explanation involves dependency relations.