

# Grounding Concerns for Scientific Practice

## Candidate:

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## Overall themes:

- (i) Metaphysics
- (ii) Philosophy of science

## Number of words hereafter (excluding citations):

998

## Summary

Scientific practice depends on being able to explain one thing in terms of another. For example, in medicine the alleviation of S's headache is explained by S having taken aspirin. This explanation is backed by a causal relation between the precipitating event of taking aspirin and the subsequent event of the headache's being alleviated. I will argue, however, that, for such scientific explanation to be in good standing, we need to explain what ultimately accounts for the causal relation; what *grounds* the obtaining of that causal relation. My thesis is that there is, in fact, no epistemically viable notion of grounding to 'bottom-out' scientific explanation in mind-independent, non-causal facts. This threatens scientific knowledge drawn from explanation. I will then consider theories according to which causation is a feature of how *we represent* reality—namely, epistemic accounts—and argue that these provide a route to a philosophically respectable account of causation. Epistemic accounts of causality circumvent the central issue of my thesis with causal *beliefs*, which purportedly ground evidence-based *inferences*. I will deploy the skills and experience I have gained from academic physics and philosophy and a career in medicine to assess what this means for medical practice. Pertinently to my previous profession, I will assess how my findings limit the optimisation of person-centred approaches, which postulate that each patient presents with a unique combination of symptoms that can be explained.

## Key research questions

These have been separated into relevant areas of philosophy; the way they are threaded together reveals my argumentative strategy. Key literature is cited along the way.

## Metaphysics

- *Metaphysical explanation*—Metaphysical explanation explores how we take explanations more fundamental. But is Bradford Skow right that 'explanation' is misleading and that we should build a theory of *reasons* based on causal laws and non-

causal grounds? Do we require the Principle of Sufficient Reason to render the reasons we provide intelligible? (Dasgupta 2016; Schaffer 2017; Skow 2016)

- *Grounding*—Grounding could be of the same species as explanation. Is grounding, then, even a distinctive notion apart from other relations such as supervenience, determination, composition, and constitution? Does this undermine scientific knowledge? (Kim 1994; Schaffer 2012, 2017; Strevens 2008; Wilson 2014; Wilson 2017)
- *Tension*—How can metaphysical tension between explanation’s mind-related features and grounding’s irreducible mind-independence be dissipated? (Audi 2012; Bernstein 2016; Koslicki 2016; Thompson 2016)

## Philosophy of science

- *Fundamentality*—Despite dramatic advances in science, we still cannot explain how causation fits into the world physics reveals. Fundamentally, can we even explain the difference between cause and effect? (Cartwright 1994, 1999; Price 2009)
- *Causality*—Which accounts of causality can be shown to bottom-out? Will a mechanistic/difference-making/dualistic/inferentialist theory do enough work? I will suggest that scientific explanations of mechanisms meet the grounding sceptic’s epistemically insurmountable wall. (Cartwright 1999; Feline tbc; Glennan 2010; Hall 2004; Ross 2019)
- *Folk theory*—I will explore epistemic theories, according to which causality is a feature of our representing reality. That is, we, as thinking agents, put forward *beliefs* (causal claims) which purportedly ground evidence-based propositions (e.g. prediction, explanation, and control inferences). But is it philosophically sufficient to cash out explanations/why-questions at this convenient level of scientific investigation? The bold implication is that there are no worldly causal relations. (Bernstein 2016; Hume 2008; Skow 2016; Williamson 2013)
- *Significance*—What does grounding mean for scientific practice? In evidence-based medicine (EBM) causal relations are seen as universal, repeatable, and robust. Meanwhile, person-centred ‘dispositionalism’ emphasises complexity, singularism, and sensitivity and encourages individualisation of treatments and greater emphasis on qualitative studies. I will argue that the latter’s scientific conclusions are rooted in conjecture about the nature of causality; that patients’ *unique* sets of symptoms cannot actually be parsed from observational data. I will recommend that we should be hesitant to jettison empirical EBM. (Anjum 2016; Laudan 1981)

## Research plan (Year 1—Year 4)

- Year 1 (2020):
  - Perform initial literature review, furnishing a notion of metaphysical explanation.
- Year 2 (2021):
  - Focus research resources on explanation-grounding tension. Attend relevant lectures and seminars. Begin writing Part I of thesis; continue thereafter.

- Year 3 (2022):
  - Move more into the domain of philosophy of science. Perform research for first two chapters of Part II.
- Year 4 (2023)—:
  - Continue research independently with even greater philosophy-of-science tact. Seek and take on board advice from relevant academic specialists where opportunities arise. Apply the corollaries of my findings to different approaches to medical research. Begin writing Part II of thesis; continue thereafter.
- Thesis structure (supervisor):
  - Introduction
  - Part I: A Survey of Causal-Explanatory Literature (NT all)
    - 1: The Linguistics of Explanation: Grammar, Reasons, and Intuitions
    - 2: Metaphysical Explanation
    - 3: The Principle of Sufficient Reason
    - 4: Grounding and Mind-Dependence
    - 5: A World of Levels: Taking Schaffer's Laws of Metaphysics Seriously
    - 6: Specific Grounding Concerns
  - Part II: Locating an Epistemically Viable Principle of Causality
    - 1: Mechanistic Accounts of Explanation (TT)
    - 2: Causal Accounts of Explanation (TT)
    - 3: Grounding, Epistemology, and Making a Diagnosis (NT)
    - 4: Problems for Mechanistic Accounts of Causality (TT)
    - 5: Williamson's Belief-Based Causality: A Viable Folk Theory? (TT)
    - 6: Medical Research: Revising Current Methodologies (tbc)
  - Conclusion
  - Bibliography

## Methodology

My project will begin as an endeavour in metaphysics but, as I gain more autonomy, will fall increasingly under a scientific remit, working closely with both of my supervisors on their specialist topics. I will use resources from the library and online. I will then embark on a period of ongoing writing for my thesis. I will continually deliver preliminary findings to colleagues and use feedback to write a target number of words a week. I will also attend public lectures and seminars to keep abreast of current research developments and prepare paper submissions for relevant journals and participate in conferences.

## Contribution

Elucidating relations (or lack thereof) between metaphysical explanation and grounding hold the potential to transfigure research endeavours in scientific practice. As a body of metaphilosophical analysis, my findings will influence what research methods are deployed in healthcare. If my conclusion is that explanation of, say, mechanisms in the body, cannot be bottomed-out, growing dispositionalism will be derailed. However, in my thesis I will also explicate the downfalls of epistemic EBM's implementation, such as systematic downplaying of mechanistic evidence. I will examine how best to organise medical research by appealing to independent normative standards.