



A framework for inter-level explanations: Outlines for a new explanatory pluralism



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ABSTRACT

According to explanatory pluralism, the appropriate explanatory level is determined by pragmatic factors, and there are no general exclusion or preference rules concerning higher- or lower-level explanations. While I agree with the latter claim, I will argue that the former is in need of revision. In particular, I will argue that by distinguishing cases of two explanations being descriptions of one underlying causal process, and two explanations being descriptions of two distinct causal processes, it becomes clear that the grain size of an explanation is in fact determined by the interplay of various pragmatic and non-pragmatic factors. Within these constraints, positive guidelines can be developed to direct us to the appropriate explanatory level. This gives us the outlines for a general framework for classifying various types of relations between explanations on different levels. After making a comparison between this new framework and standard explanatory pluralism, I end by suggesting some ways in which the framework could be further developed.

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1. Introduction

This article is about inter-level explanations. Because these terms can be used in a variety of ways, let me start by making some clarifications. First, I shall assume what I call a scientific disciplines account of levels. That is, with 'level' I mean a *level of description*, or a specific grain size, through which phenomena are studied and explained, not levels in nature.¹ Thus, when I speak of an inter-level explanation, I mean that the explanandum and the explanans are couched in different scientific vocabularies. Obviously, on this account an intra-level explanation is an explanation where the

explanandum and the explanans are couched in the same scientific vocabulary.

Second, I shall restrict myself to situations in which multiple explanations address the same explanandum, with at least one of these being inter-level with respect to that explanandum. Third, although formulated like this, the issue is neutral with regards to whether the inter-level explanation is at a higher or a lower level than the explanandum, I will mainly focus on the latter type of situation. Thus, to illustrate these three points, an example of the type of situation I am concerned with is when a psychological state like 'being depressed', is simultaneously addressed by an explanation couched in psychological terms (e.g. feelings of neglect during childhood) and a neurophysiological explanation (e.g. reduced serotonin levels in the prefrontal cortex). From now on, I shall use the phrase 'multiple inter-level explanations' as shorthand expression for situations like this. Finally, this paper deals with *causal* explanations. I do not wish to suggest that non-causal (e.g. mathematical) explanations do not exist, but this article is not about them.

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¹ This assumption is not innocuous. Craver, to name just one example, favors an ontological account of levels when it comes to multi-level explanations in neuroscience (2007 p. 177). Of course, adopting a scientific disciplines account of levels does not mean there will never be differences in ontology; it just means that when it comes to differentiating levels, I will draw upon scientific vocabulary rather than ontology.

In any case, when we have multiple inter-level explanations, which one should we go for?² Do we prefer the explanation that addresses the target phenomenon at its own level, or do we prefer a lower-level explanation? Of course, if we maintain that one of these levels is somehow privileged over the other, we end up with positions such as reductionism or eliminativism. If, on the other hand, we believe that there is no privileged status for any level, then we might opt for some form of methodological dualism. Alternatively, we might say that these relations apply only locally. That is, though there might be cases of reduction or elimination, these relations as such do not represent essential ingredients of scientific progress. This latter position has become known as explanatory pluralism (McCauley, 1996, 2007; McCauley & Bechtel, 2001).

Of course, the history of science testifies to successful local reductions and eliminations, and these are not ruled out by explanatory pluralism. The point is that as the grand, sweeping theories such as classic reductionism and methodological dualism fell out of favor, philosophers increasingly realized that explanations of different grain sizes coexist and exert mutual influence on each other. Rather than on philosophical ideology, the choice of grain size depends on contextual or pragmatic factors.

It would be unfortunate however, if this is where the theorizing stops, i.e. if the claim that pragmatic factors determine grain size is viewed as a terminus for the philosophical debate about inter-level explanations.³ In my view, this picture is at best incomplete. While it is true that pragmatic considerations play an important role in selecting or emphasizing a particular explanatory level, there are also other, non-pragmatic ontological factors at work.⁴ However, their influence is not deterministic: although it puts constraints on our choices and preferences, within those constraints, there is ample room for pragmatic considerations to come into play. Moreover, the fact that pragmatic factors play this role does not mean that anything goes: as we shall see, it is possible to draw up guidelines to help us understand just what pragmatic factors are at work, and how they lead us to emphasize one explanatory level over the other. Thus, although the explanatory pluralist is right in stating that reduction, elimination etc. apply only locally, it does not follow that they apply randomly. To make sense of the choices scientists make when confronted with multiple inter-level explanations, we need to understand the subtle interplay of pragmatic and ontological factors that influence these choices.

In this article, I offer a framework for classifying both pragmatic and non-pragmatic factors influencing our preferences for particular levels when providing or pursuing causal explanations. I will argue that although this framework stays true to the basic tenets of explanatory pluralism, it represents a step forward, in that it identifies situations in which ontological factors constrain the influence our pragmatic interests have, and offers guidelines that help us to understand the choices made by scientists. Although the

result will be a general conceptual framework, rather than a finished product, it does clearly point to ways to augment and refine it with subsequent research. As such, the framework presented at the end of this article has a programmatic character.

Here is an outline of the paper. First, I will briefly present what I take to be the central claims of explanatory pluralism (Section 2). Next, I will introduce a distinction between situations in which multiple inter-level explanations cite one underlying causal process, and situations in which they cite multiple, genuinely distinct causal processes (Section 3). While the debate between explanatory pluralism and reductionism (of various sorts) seems to mostly focus on the former type of situation, in this article, I will concern myself with the latter type. Combining the previous material with a distinction between relevant causal factors and productive causes, I draw up a preliminary taxonomy of types of relations that can obtain between multiple inter-level explanations (Section 4). I then introduce some pragmatic factors that influence our choices to emphasize one explanatory level over another (Section 5) and draw on these factors to construct three guidelines that help us to make such choices, and understand the ones made by scientists (Section 6). I will illustrate how these guidelines work in practice by considering a case study, namely multiple inter-level explanations of the Korsakoff syndrome (Section 7).

Next (Section 8), I shall present my conceptual framework. I will contrast it with standard explanatory pluralism, and argue that although it stays true to the general spirit of explanatory pluralism, it does suggest a more nuanced picture of the ways multiple inter-level explanations can relate. I will end by considering some ways the framework might be expanded in the future.

2. Explanatory pluralism

In contrast to traditional reductionism or eliminativism, explanatory pluralism acknowledges the multiplicity of explanation. Explanations at different levels can exhibit anything from reduction to mutual co-evolution, from elimination to integration. Rather than strict ontological commitments, the identities postulated between the entities of lower- and higher-level explanations are at best heuristic and hypothetical in character, open to revision or abandonment as the need arises (McCauley & Bechtel, 2001). Typically, descriptions of one phenomenon at different grain sizes can exist simultaneously, mutually influencing each other. In due course, it might be that one is discarded, but there is no guarantee that this will always be the higher-level explanation. In fact, it is argued, furnishing explanations at multiple levels fuels scientific progress (Bechtel & Richardson, 1993; Hardcastle, 1996; Looren de Jong, 1997). With this in mind, we should not only focus on the diachronic dimension of theory succession, as reductionists tend to do, but also allow for synchronic co-evolution of explanations (McCauley, 1996, 2007; Schouten & Looren de Jong, 1999). Ultimately, for explanatory pluralists, the choice of grain size is determined by pragmatic factors operative at a given moment, i.e. on what you want to achieve with your explanation.

The basic claims comprising explanatory pluralism can be summed up as follows:

- 1 It is impossible to rule out explanations of any specific grain size in general.
- 2 It is incorrect to claim that explanations of one specific grain size are always superior to explanations of another grain size.
- 3 Having multiple inter-level explanations can be beneficial to scientific progress (both diachronic succession and synchronic co-evolution should be allowed).
- 4 The choice between grain sizes is decided by pragmatic factors.

² As we will see, the issue is not always one of choosing between different explanations: sometimes, different explanations are actually complementary and can be integrated into a single, compound explanation, so that the issue is not a choice between explanations, but a choice to *emphasize* one part of an explanation over another part, given some practical purpose. In Section 4, I will discuss this issue in more detail.

³ Which is not to say that no one has ever attempted to explicate these factors—see Section 2.

⁴ The distinction between pragmatic and non-pragmatic factors may not always be clear cut, and within the scientific pluralism literature, authors may draw the boundaries somewhat differently. Although a rigid distinction is not necessary for the arguments I will develop in this article, in general, pragmatic factors are factors that have to do with our own interests or motives (unification, prediction etc.), while non-pragmatic factors are imposed on us by the world, independently of our interests.

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