

Understanding in Epistemology and Philosophy of Science: A Complicated Relationship

Stephen Grimm, Christoph Baumberger, and Sabine Ammon (eds.): *Explaining Understanding: New Perspectives from Epistemology and Philosophy of Science*, New York and London: Routledge, 2017, xvi+337 pp, £110 HB

It is widely acknowledged that understanding something is a particularly valuable cognitive achievement. Perhaps relatedly, understanding is often taken to be an important aim of science. But what, exactly, is understanding? And what philosophical work can a concept of understanding do for us, e.g. in accounting for scientific practice or in shedding light on epistemological conundrums? The 15 essays in *Explaining Understanding: New Perspectives from Epistemology and Philosophy of Science* address questions of this sort. The volume includes essays by several leading scholars from both epistemology and philosophy of science – the two fields in which such questions about understanding have recently become widely discussed. The stated aim of the book is to bring the two fields together by having philosophers from each side “join forces to address fundamental philosophical questions about the nature of understanding” (p. xi).

Explaining Understanding contains some excellent essays that are likely to become highly influential.¹ For example, Michael Strevens and Soazig Le Bihan offer different accounts of how idealizations provide understanding of empirical phenomena despite distorting the reality that we are trying to understand. While Strevens offers a view on which idealizations serve to highlight ‘difference-makers’ in a more efficient way than non-idealized theories would, Le Behan offers a modal view on which idealizations help us navigate a ‘possibility space’ of the phenomena we are trying to understand. Both are very interesting new perspectives on scientific idealizations that are well worth reading for anyone interested in the role of idealizations in science. Those interested in the relationship between understanding and traditional epistemological notions such as justification, belief, coherence, and testimony will also find stimulating and highly original contributions in this volume. Furthermore, the essays are prefaced with an excellent overview of recent debates about understanding by Christoph Baumberger, Claus Beisbart, and Georg Brun.

It should thus be clear that both epistemologists and philosophers of science will find valuable contributions to the literatures on understanding in each respective field. What is less clear is whether the volume succeeds in bringing the two fields together in a fruitful way. To be sure, some of the essays – in particular those by Sabine Ammon, Kareem Khalifa, Mark Newman, and Daniel Wilkenfeld – do indeed tie together epistemological theories or concerns with theories of understanding developed in philosophy of science. However, other essays make no discernable connection between the two literatures. For example, John Greco appeals to a somewhat idiosyncratic notion of ‘understanding-as-acquaintance’

¹ I lack the space here to discuss each one of the 15 essays, or even all of those that I found most illuminating.

in an attempt to diagnose the idea that externalist theories of knowledge trivialize the problem of skepticism; and J. Adam Carter and Duncan Pritchard appeal to their claim that understanding involves a more intimate ‘cognitive ownership’ than knowledge in developing a specific form of skeptical argument on the basis of cognitive biases. While these essays are interesting enough in their own right, they do not really touch on the type of concerns that are typically of interest to philosophers of science.

So my impression is that the volume only partially succeeds in bringing together work on understanding within epistemology and philosophy of science. To be fair, discussions of understanding within each respective field have developed largely independently of one another, so even partial success in this regard could be seen as a step in the right direction. However, this prompts the question of why it has proved to be so hard to elicit insights from one of these literatures to exploit within the other literature. Beyond the obvious sociological explanations, I suspect that there may be a deeper methodological reason for the persistent division of the topic into two largely independent literatures. Let me explain.

Simplifying quite a bit, the typical methodology in philosophy of science develops a philosophical idea or concept by appealing to some specific aspects of scientific practice. In the case of understanding, the aspects in question might include the fact that scientists construct models that they know to be inaccurate in various important respects (idealizations). Or it might be the fact that scientists do not consider discoveries of statistical correlations to be of much value unless they can connect the correlated variables via some theory or model, often with a causal connection. In any case, a philosophy of science worth its salt should make sense of these types of facts about scientific practice – it should explain why scientists do or value these sorts of things. To that end, philosophers of science have developed definitions of ‘understanding’ that are meant to help us make sense of these practices. Preferably, the defined concepts should be sufficiently simple and clearly delineated to make it relatively easy or straightforward to apply them in cases other than those they were developed to account for.

Note that the aim here is emphatically not to capture the meaning of an everyday, pre-theoretical concept. In other words, it is not an *analysis*. Nor is this necessarily an attempt to *explicate*, in the Carnapian sense, a concept used by scientists themselves by precisifying or improving on it. To see that, note that even if no scientist or laypeople had ever employed the term ‘understanding’, one could still hope to explain these aspects of scientific practice with a suitably defined theoretical concept of understanding. Put differently, if the concept of understanding did not already exist, one could simply invent it – much like, e.g., Kuhn invented the concept of a ‘paradigm’. Of course, if there is a term in ordinary usage associated with an everyday concept that resembles the theoretical concept one is seeking to define, then it will be *conveniently suggestive* to use the term in question to denote the new concept. Beyond that, our ordinary, every-day, pre-theoretical concepts – e.g. of explanation, causality, and, indeed, understanding – are arguably quite irrelevant for the project of accounting for the relevant aspects of scientific practice.

By contrast, the methodology of some relevant parts of contemporary analytic epistemology is much more closely tied to analyzing pre-theoretical epistemological concepts, including the concept of understanding. To be sure, the epistemologists in question have moved on from 'ordinary language philosophy' in which the sole criterion for success was to uncover the meaning of common terms as they are used by people in everyday contexts. Nevertheless, it is still very much taken for granted that a proposed definition of a concept can be 'counterexamples' by instances in which the definition diverges from our intuitions about how the meaning of the term. Indeed, 'counterexamples' of this kind are sometimes taken as the paradigm type of argument against a proposed definition, with other types of considerations – such as the fruitfulness of the defined concept in explaining some aspect of epistemic or scientific practice – bearing less weight.

These differences in methodology between philosophy of science and (some relevant parts of) epistemology translate into differences regarding what is captured by definitions of understanding within each of these two fields. While philosophers of science will seek to define a theoretical concept that can be used to make sense of various aspects of scientific practice, epistemologists will hope to define something much closer to our ordinary concept of understanding. This is not much of a problem *per se* – different people are allowed to use the same linguistic term (the same string of symbols or sequence of sounds) for different concepts. What would be a problem is if the two concepts were *confused*, in the literal sense of being mixed together to the point of us losing a grasp of the important distinctions between them. The danger, specifically, is that aspects of a concept developed to fit our pre-theoretical intuitions about understanding would unthinkingly be applied to explaining scientific practice, or *vice versa*.

Unfortunately, I fear that this is where some of the work on understanding may be headed – or, indeed, may have already gone. To illustrate, consider for instance the supposed connection between understanding and epistemic justification. In early discussions of understanding in philosophy of science, there was very little, if any, mention of epistemic justification in relation to understanding. Of course, those who think that understanding requires (approximately) accurate representations (a majority view in philosophy of science) will see epistemic justification as a means to secure understanding, since it is instrumental for having accurate representations. But as far as I can tell no one in the earlier literature posited an additional necessary condition on understanding to the effect that an unjustified theory could not be used to to understand something. This was presumably because such a 'justification requirement' on understanding complicates the concept without helping us explain any relevant aspect of scientific practice that cannot already be explained by the value of epistemic justification for achieving accurate representations.

By contrast, most epistemologists who have discussed the nature of understanding have argued that our ordinary concept of understanding involves a justification condition of some sort or other. I happen to disagree with the majority view on this point (Dellsén 2017; see also Hills 2016), but let's set that aside here. Even if our ordinary concept of justification

is subject to a justification requirement, it simply does not follow that the concept of understanding that is most appropriate for explaining relevant aspects of scientific practice is also subject to such a requirement (in fact, as noted, we have reason to believe it is not). For this reason, it would be a mistake to defend a definition of understanding in the context of philosophy of science by appealing to pre-theoretical intuitions about whether someone who lacks justification could really be said to understand.

And yet it seems to me that this is exactly what we often see in the literature these days, including in many of the essays in this collection. Thus Kareem Khalifa defends his ‘scientific knowledge approach to understanding’ (SKU) by appealing directly to one hypothetical person’s understanding being “intuitively superior” to another’s (p. 148). Similarly, Stephen Grimm argues that understanding – which he appears to take as an important aim of science (p. 212) – requires a form of epistemic justification on the grounds that “it is hard to believe” that one could come to understand something if one’s methods are unreliable (p. 218). Finally, Christoph Kelp – who hopes to account for scientific progress and the value of scientific idealizations in terms of understanding (p. 263-5) – argues for his account of understanding by appealing to a number of “intuitive results” about one hypothetical person’s understanding being “better” than another’s (p. 256-9). My point here is not that there is something in principle wrong with appealing to intuitions. Rather, the point is that there is no apparent reason to think that pre-theoretic intuitions will help us define the concept of understanding that is most useful for making sense of scientific practice.²

References

- Dellsén, F. 2017. Understanding without Justification or Belief. *Ratio* 30: 239-254.
Hills, A. 2016. Understanding Why. *Noûs* 49: 661-688.

² I am grateful to Christoph Baumberger for helpful feedback on an earlier version of this review.