



EXPLAINING UNDERSTANDING

New Perspectives from Epistemology
and Philosophy of Science

Edited by
STEPHEN R. GRIMM,
CHRISTOPH BAUMBERGER
AND SABINE AMMON



Explaining Understanding

What does it mean to understand something? What types of understanding can be distinguished? Is understanding always provided by explanations? And how is it related to knowledge? Such questions have attracted considerable interest in epistemology recently. These discussions, however, have not yet engaged insights about explanations and theories developed in philosophy of science. Conversely, philosophers of science have debated the nature of explanations and theories, while dismissing understanding as a psychological by-product. In this book, epistemologists and philosophers of science together address basic questions about the nature of understanding, providing a new overview of the field. Its fifteen original chapters are essential reading for researchers and graduate students interested in the current debates about understanding.

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Guide to the Essays

In our epistemic endeavors, we do not only strive for knowledge and rational belief. We also want to understand what we believe. We search for explanations of facts and for theories that systematize our knowledge. But what does it mean to understand some phenomenon or a subject matter? What types of understanding can be distinguished? Is understanding always provided by explanations? How is it related to knowledge? And how can we justify claims to the effect that we understand something? Such questions have attracted much interest in epistemology since the central role of understanding has been recognized recently. However, the discussions in epistemology have not yet reaped the benefits of insights about explanations and theories that have been developed in philosophy of science. Conversely, philosophers of science have extensively debated the nature of explanations and theories, while often neglecting understanding as a mere psychological by-product of explanation. In this book, epistemologists and philosophers of science join forces to address fundamental philosophical questions about the nature of understanding.

The opening chapter by **Christoph Baumberger**, **Claus Beisbart**, and **Georg Brun** provides an overview of recent debates about the topic. The authors explain why philosophers have turned their attention to understanding and discuss conditions for those two types of understanding that have dominated the debates, namely “explanatory” understanding of why something is the case and “objectual” understanding of a whole subject matter. The most debated conditions roughly resemble the three traditional conditions of knowledge: truth, justification, and belief. The authors discuss different views about how to construe these conditions for understanding, whether understanding indeed requires conditions of all three types and whether additional conditions are needed. The analogy with the three traditional conditions for knowledge provides also the structure of the book, where each part takes up one of the conditions.

PART I: UNDERSTANDING AND THE FACTS

The essays in the first part address the role that truth or the facts play for understanding. On the one hand, it may seem plausible that explanations and theories need to be at least approximately true to provide understanding. This is what factivists claim. On the other hand, it is clear that models involving highly unrealistic idealizations can enhance understanding. And it seems even possible to use fictions and counterfactual scenarios to advance understanding.

Michael Strevens belongs to the factivist camp. According to his “simple view,” to have explanatory understanding of a phenomenon is to grasp a correct explanation of the phenomenon. In his contribution, Strevens combines the simple view with a factivist account of how idealizations can enhance understanding. He suggests that, in comparison with realistic models, idealizations advance understanding by indicating more efficiently that certain factors make no difference to the explanandum. Moreover, Strevens argues that manipulating idealized models can also more readily provide insight into why some causal factors are difference-makers and help to grasp the nature of explanatory connections and so to better grasp the explanation itself. The reason is that in an idealized model it is easier to see how the difference-makers work together to produce the explanandum.

Henk de Regt and **Victor Gijsbers**, in their contribution, disagree with Strevens. They point out examples from the history of science and from scientific education in which theories that are utterly false are used to understand something. However, they admit that not any false theory can provide understanding. What then are the conditions under which a theory can be used to advance our understanding? De Regt and Gijsbers suggest to replace a factivity or veridicality condition by an “effectiveness condition” on understanding, understanding requires representations which reliably lead to scientific success – that is, to correct predictions, successful practical applications and fruitful ideas for further research. It is thus not the theories that need to be true, rather they need to reliably lead to true conclusions.

While De Regt and Gijsbers still assign truth a central role for understanding, the next three chapters defend a more skeptical view on truth in understanding and propose alternatives that may take the role of truth. **Catherine Z. Elgin** claims that exemplification is crucial for understanding. She focuses on objectual understanding by means of a comprehensive body of information. The idea is that exemplification provides the necessary tie to the facts. This allows that even highly idealized models and fictions can provide understanding if they exemplify important features they

share with the facts. Elgin uses examples from the sciences, ethics, and aesthetics to show how exemplification affords epistemic access to matters of fact that are otherwise difficult or impossible to discern.

Sabine Ammon puts rightness at the center of her account of understanding. She draws on a proposal by Nelson Goodman and Catherine Elgin who introduced understanding as a dynamic process of equilibration which leads, if successful, to rightness. Making this account fruitful allows Ammon to further differentiate the epistemic field with key concepts such as understanding, personalized forms of knowledge, knowledge manifestations, epistemic practices, techniques, and strategies. Ammon argues that her procedural epistemology paves the way to a revised notion of knowledge which overcomes obstacles in the theory of knowledge, such as a limited range, an exclusive focus and an overreach of specific forms of knowledge.

According to **Soazig Le Bihan**, understanding is not so much achieved by knowing the actual facts, but rather by recognizing other possible ways in which things might have gone. In her contribution, she develops this idea into what she calls the “modal view” of understanding. According to this view, understanding a phenomenon requires that one knows one’s way through the possibility space associated with the phenomenon. This space reflects the possible dependency structures underlying the phenomenon and the relations between those structures. Le Bihan argues that unlike Strevens’ simple view, her modal view leads to a notion of understanding, which is neutral toward the debate over scientific realism.

PART II: UNDERSTANDING AND ITS NORMS

The essays in the second part discuss which normative standards or ideals need to be fulfilled for understanding. Of course, truth, or a surrogate for it, is one of them, but as for knowledge, it does not suffice. We additionally need something like justification.

An obvious candidate is coherence. It has often been noted that understanding involves grasping explanatory, probabilistic and inferential relations among our beliefs, and the notion of coherence may be fruitfully used to capture these relations. The first two chapters discuss whether coherence is indeed pivotal for understanding. **Kareem Khalifa** argues that understanding involves only a requirement of quasi-coherence which follows from his “science-first account” of explanatory understanding. According to this account, one’s understanding is the better the more closely it resembles scientific explanatory knowledge. Such knowledge requires systematic evaluation of potential explanations, but this requirement is compatible with foundationalism. Khalifa rejects any stronger

requirements of coherence as implausible and argues that his account outperforms coherentism as the best explanation of why understanding involves grasping relations within a domain.

Christoph Baumberger and **Georg Brun**, by contrast, make a case in favor of coherence. They propose an explication of objectual understanding and argue that its justification condition can be spelled out with reference to the idea of a reflective equilibrium. The resulting account requires coherence between commitments of the agent, her theory, and background assumptions; but it additionally requires that the theory does justice to epistemic goals and that the resulting position respects the agent's antecedent commitments about the subject matter at hand. Moreover, the authors argue that in the context of objectual understanding, justification requires that the agent can make it sufficiently plausible that her position is in fact in reflective equilibrium.

The idea that the agent needs to have reflective access to the coherence and other relations between her beliefs or commitments is familiar from accessibilist versions of internalism about knowledge. In the last years, internalism about knowledge, be it of the accessibilist or the mentalist flavor, has been increasingly challenged by externalists. But maybe understanding provides a better home for internalist intuitions than ordinary propositional knowledge. The last three chapters of Part II deal with this question and related issues.

Mark Newman develops an evidentialist account of explanatory understanding and defends thus a (mentalist) form of internalism with respect to understanding. The driving idea behind evidentialism as advanced by Earl Conee and Richard Feldman is that epistemic justification is determined by one's evidence. Newman argues that to make an evidentialist account of understanding work, one needs to adopt a default reasoning form of evidentialism and to distinguish between knowing an explanation and understanding an explanation which requires inferential abilities that go far beyond merely understanding what the explanation says. According to Newman, this can be achieved by subsuming the evidentialist account under an inferential model of understanding.

Stephen R. Grimm is much more pessimistic about the prospects of internalism with respect to understanding. He argues that understanding involves grasping dependency relations among our beliefs, and that grasping them is not just to believe that those relations obtain. We need also be able to see what would have been the case if things had been different in various ways. However, Grimm thinks that certain animals and young children can understand things and thus grasp some dependency relations even though they cannot articulate them. As a result, understanding is much less reflectively accessible than internalists might

have thought. In closing, Grimm considers the possibility that the proper home for internalist intuitions is in fact in the state of wisdom, rather than understanding.

John Greco agrees that understanding does not favor internalism, but he reaches this conclusion in a different manner. He argues that contemporary internalists about knowledge are driven by the Pyrrhonian worry that externalism cannot provide a satisfying understanding of knowledge. The understanding externalism provides is explanatory knowledge of how one knows, but the understanding Pyrrhonians want is acquaintance-understanding in the sense that for all p , if one knows that p , then either one can have acquaintance with the fact that one knows that p or one can prove that one knows that p from facts with which one is acquainted. Greco argues that the understanding which internalists seek is unattainable since it implies the long discredited requirement that knowledge implies certainty.

PART III: UNDERSTANDING AND THE EPISTEMIC AGENT

The third part asks which mental states and cognitive abilities are required for understanding. Understanding is attributed to epistemic agents, as is knowledge. We thus need an explanation of why knowledge and understanding attach to agents. For knowledge, the belief condition does just this because belief is a mental state of an agent. But how is understanding tied to agents?

One way of answering this question is to say that understanding just is a form of knowledge. Strevens' simple view and Khalifa's science-first account do this, and the first chapter of Part III defends such a knowledge-based account of understanding too. **Christoph Kelp** identifies ideal understanding of some phenomenon with maximal knowledge of the phenomenon. He then explains degrees of understanding in terms of distance from maximal knowledge. Kelp combines his proposal with a contextualist semantics to account for outright attributions of understanding. He argues that in contrast to the internalist competitors offered by Jonathan Kvanvig and Catherine Elgin, his account can accommodate data concerning comparative degrees of understanding and that it does not face a number of objections against knowledge-based accounts of understanding in recent literature.

J. Adam Carter and **Duncan Pritchard** oppose such a reduction of understanding to propositional knowledge. At other places, Pritchard has argued that understanding-why is a cognitive achievement that neither implies, nor is implied by, propositional knowledge. In the present contribution, Carter and Pritchard show that this makes understanding much

more vulnerable than knowledge to bias-driven skeptical challenges that have recently been put forward by Mark Alfano and Jennifer Saul. Alfano and Saul appeal to empirical studies on cognitive biases to argue that at least in certain domains we know a lot less than we have hitherto supposed. According to Carter and Pritchard, arguments along these lines are much more successful when targeted at understanding rather than at knowledge.

The idea that knowledge and understanding are interestingly different is **Emma Gordon's** starting point for connecting the debate about understanding with debates in social epistemology concerning testimony, which so far have almost exclusively focused on justification and propositional knowledge. Gordon argues that objectual understanding cannot plausibly be given from speaker to hearer in the same way knowledge can. Furthermore, she considers aspects of understanding which can be promoted by speaker-hearer interactions and explores the mechanisms by which an individual can come to acquire (or gain deeper) understanding from another. To this end, she conducts a case study in which understanding is facilitated in a counseling setting.

One reason why understanding is more demanding than ordinary propositional knowledge and cannot easily be transmitted through testimony is that it requires grasping connections between items of information. The grasping requirement, in turn, is intimately connected with the widespread idea that certain abilities are crucial for understanding. **Daniel A. Wilkenfeld**, for instance, has suggested that we understand a phenomenon if we can manipulate representations of it in useful ways. In his chapter, he explores an interesting consequence of his account: Understanding does not even require belief. One can use a proposition q to understand why p is the case even if one does not believe that q explains p . His argument for this claim is an extension from other attempts to show that understanding does not depend on justification. Moreover, Wilkenfeld constructs an example in which understanding and belief come apart and argues that in this case not even a weaker variant of full belief (such as thin belief or dispositional belief) is present.