

Grasp as a Universal Requirement for Understanding

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ABSTRACT

Many varieties of understanding subsist in a thinker's having the right kind of mental connection to a certain body of fact (or putative fact), a connection often called "grasp". The use of a single term suggests a single connection that does the job in every kind of understanding. Then again, "grasp" might be an umbrella term covering a diverse plurality of understanding-granting mind-world relations. This paper argues for the former, unified view of grasp in two ways. First, it advances a broad, ability-based construal of grasp, along with a test for lack of grasp, that suggests that a certain specific connection plays an essential role in many varieties of understanding. Second, the paper considers a number of challenges to the thesis of unity that arise in a range of different kinds of understanding (scientific, moral, objectual, humanistic), and seeks to disarm them.

1. Understanding Is Where the Mind Meets the World

There can be explanations without explainers. The planet earth's sky was blue long before humans came along, and the explanation of that blueness—the refraction of proportionally more short-wavelength than long-wavelength sunlight—likewise predated the evolution of intelligent life. Whether the sky or the human race disappears first, it will always remain the case that the correct explanation of those millennia of blueness was the scattering effect.¹

1. This does not mean that human standards play no role in determining what counts as a good explanation. Rather, it means that what those standards pick out as explanatory—certain facts about the scattering of light—do not depend on human knowers for their existence.

But there can be no understanding without understanders. When intelligent life is extinguished, all understanding will go with it. The explanations endure, but if there is no one to grasp the explanations, there is no understanding.

These platitudes illustrate the single most important facet of understanding: it is a matter of the mind's encountering, framing, connecting to, in the right sort of way, some aspect of the world. Understanding is a place where the mind meets the world.

But what kind of meeting—what kind of connection? This paper will present and defend the thesis that there is a single epistemic relation that serves the function of connecting mind and world in numerous different kinds of understanding. Call that relation “grasp”—for now, a placeholder. I will propose that various forms of understanding differ in what is grasped, but not in the nature of that grasp.

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The notion that a mind-world connection felicitously glossed as “grasp” plays a central role in understanding has been endorsed, at least in passing, by many writers (including, among others, Kvanvig (2003); Newman (2012); Strevens (2013); Elgin (2017); Belkoniene (2023)). A closer examination of the literature suggests, however, that this consensus may be rather superficial.

For some writers, what must be grasped is an explanation of the fact to be understood; for others, it is constitutive of the fact to be understood. In the case of moral understanding, for example, it is contentious whether understanding consists in grasping the moral valence of a certain outcome or rather in grasping an explanation of that valence (Sliwa 2015).

Meanwhile, some writers have suggested that grasping an explanatory structure is a rather different thing from grasping, say, that a certain state of affairs (e.g., the sky is blue) obtains (Grimm 2014; Belkoniene 2023). There is one word, but there are two relations.

A parallel concern is that, for some varieties of understanding, grasp

is of things in the world, such as causal relations, but for others—such as understanding a false theory—grasp is of a meaning or a representation or some other conception that stops short of the world itself.

Finally, whereas for some writers grasp can be of esoteric theoretical properties for which we have no intuitive model, such as quantum superposition (Strevens 2024), for others it requires a certain phenomenological acquaintance that might be thought to be unattainable in such cases (Bourget 2017; McSweeney 2023).

In short, it is far from clear that there is a single “grasping” relation involved in every variety, or even in the majority of varieties, of understanding. This paper presents a number of arguments resolving these difficulties, so advancing the case for a unified notion of grasp.

To advance the case is not to seal the deal: that would require, I presume, a positive theory of grasp, accounts of the many varieties of understanding, and a demonstration that the self-same mind-world connection shows up and plays an essential role in every case. I hope to make progress toward the goal in a more modest capacity, by attempting to solve a number of auxiliary problems, while remaining as ecumenical as possible about the nature of grasp.

Not entirely ecumenical, however: I will assume that grasp manifests itself in a kind of inferential ability, and thus that a lack of grasp can be diagnosed from certain inferential limitations. This test provides a handle on grasp that supplies *prima facie* reasons, at least, to think that a certain pivotal mind-world relation is present wherever understanding is found.

By the end of the paper, then, I hope to have taken a few further steps down the road to a conception of understanding that invokes a unified notion of grasp. Understanding is not one thing, on my view—because the nature of the things grasped varies with the kind of understanding—but a crucial and distinctive component of understanding is indeed the very same thing in every kind of understanding.

2. Understanding Why

Let me introduce the notion of grasp by identifying its role in a familiar form of scientific understanding, namely, understanding why some event occurred, or why some state of affairs obtains, or why some regularity holds—what many writers have called “understanding-why”. I will assume what I have in other work called the “simple view” of understanding-why (Strevens 2013). For brevity’s sake, let me focus on understanding singular events, concerning which the simple view says:

To understand why a certain event occurred is to grasp a correct explanation of that event.

In my own interpretation of the simple view, which is based on a causal approach to scientific explanation, the explanation in question—the thing that is grasped—is a causal structure, that is, an assemblage of individual states of affairs (or boundary conditions) and causal laws (or lawlike regularities) standing in the right kind of causal relation to the event to be explained.² (It is the task of a philosophical account of explanation to specify what kind of assemblage standing in what kind of relation to the explanandum constitutes an explanatory causal structure, but that is not my concern here.)

On other, non-causal approaches to scientific explanation, the explanation might be a structure involving patterns of events and a relation of pattern subsumption between the event to be explained and the patterns in question—a pattern instantiation structure, you might say (Kitcher 1989). Or the explanation might be a statistical structure (Salmon 1970), or in some cases a structure of metaphysical dependence. In every case the explanation is a structure in the material world, and grasp is therefore a relation between the mind and the world.

2. For versions of a causal approach to explanation, see Salmon (1984), Woodward (2003), and Strevens (2008), among others.

There is a different tradition of thinking about explanation, however, following Hempel and Oppenheim (1948), in which an explanation is not something material but rather something semantic or formal—typically, a set of statements or propositions about the material world: that certain initial conditions held and that certain laws obtain, for example, perhaps along with a certain logical structure connecting the explanatory statements and a description of the event to be explained. If that is what an explanation is, then grasp is a relation not between the mind and the material world, but rather between the mind and (so it would seem) the contents of those statements or propositions, along with the formal structure that unites them in explanatory action.

It will ultimately turn out that either approach fits well with the things that I want to say about grasp. It doesn't matter much whether we talk of grasping material facts (a certain boundary condition, say), or grasping statements of material fact (for example, the assertion that the boundary condition holds). For expository purposes, I will at first assume the former sense of explanation, and thus the view that explanations are material structures and that grasp is a relation between the mind and those structures. But eventually, we will run into forms of understanding that appear to involve grasp of false statements (section 4.3). That is one of a number of points in this paper where grasp will threaten to break apart into several related but distinct notions. It is a principal aim of this paper to preserve the unity of grasp in the face of apparent bifurcation. That problem, however, is deferred; for now, let me assume that grasp, in the context of the simple view of scientific understanding—why, constitutes some kind of connection between the understander's mind and an explanatory causal structure in the world.

An explanatory causal structure, I have suggested, is some mix of initial conditions, an event to be explained, causal laws or regularities, and the relevant causal relations between them—for example, the relation in virtue of which certain initial conditions, by way of certain laws, bring about the

explanandum event. To grasp an explanatory structure is to grasp all of this, and therefore, to grasp a certain set of facts, laws, and causal relations. Stated in terms of logical character, the structure is a set of individuals, properties, relations, and facts about instantiation (e.g., that this individual instantiates a certain property—that it has a certain mass, say—or that these two properties instantiate a relation of nomic necessitation).

My aim is to make space for almost any conception of causal-explanatory structure. I don't assume that laws are relations of nomic necessitation rather than simple patterns of events; I accommodate both. Likewise, I don't assume that the regularities that are the glue of an explanatory structure are laws, properly speaking. Perhaps they are "invariant generalizations" (or rather, the physical facts represented by such generalizations) or something else (Woodward and Hitchcock 2003).

However these questions are resolved, grasp threatens to fission into multifarious connections between mind and world, related but nevertheless distinct, corresponding to the various kinds of elements in an explanatory structure: a relation to singular states of affairs, a relation to properties, a relation to causal structure, and so on. Could a single mind-world connection embrace all of these worldly relata? That might seem unlikely; Belkoniene (2023, 606), for example, writes that grasp involves "two distinct elements", one pertaining to states of affairs and one to explanatory structure, while Grimm (2014) holds that grasp of a causal structure subsists in a non-propositional mental connection to a modal space, whereas other forms of grasp (I presume) might consist in bodies of propositional knowledge. In that case, philosophers' use of the single word "grasp" would conceal an underlying heterogeneity in the stuff of understanding.

One way to resolve this question is to resolve the question of the nature of grasp. That is surely, in the end, the more powerful strategy. But in the meantime, and given that agreement on any such solution will surely be difficult to obtain, I will take the alternative strategy foreshadowed above: to

make a case that grasp of states of affairs and properties and structure is at bottom the same thing without saying exactly what kind of thing it is.³

My approach has two strands: first, the development of a test for grasp that suggests a certain homogeneity to the relation, and second, a claim about the nature of grasp that falls well short of a complete account, but that contains a germ of such an account showing how grasp might be capable of relating the mind to such different things as singular events and causal structure.

3. Grasp In the Simple View of Understanding Why

My aim is to say enough about the mind-world connection at the core of scientific understanding-why to persuade you that it might well be a single thing, and not a collection of related things.

Let me open the discussion with a skeptical question about the simple view of understanding. Why, in order to attain understanding, is it necessary to *grasp* a correct explanation? Why is it not enough, say, to *believe* a correct explanation? Might, in other words, the special mind-world connection characteristic of understanding be none other than straightforward mental representation—belief, or something in the ballpark (such as partial belief)? (A distinct question that has been discussed at length in the literature is whether grasp in particular, or understanding in general, requires not merely belief but knowledge of the matters in question (Kvanvig 2003; Pritchard 2010; Hannon 2021). For the most part, this paper will put that question to one side.) To show that understanding requires something on top of belief, a number of writers have sketched scenarios in which a thinker believes the correct explanation for some phenomenon but nevertheless falls short of full understanding (Pritchard 2010; Strevens 2024). Here is one such case.

Consider a high-school physics student who is learning about the notion of potential energy. It is introduced in the context of a theory with which they

3. That said, I have offered a specific theory of grasp in scientific understanding-why in Strevens (2024).

have some familiarity, that of Newtonian gravity, in the form of gravitational potential energy. At first they are, as so often in elementary physics instruction, given a formula: the gravitational potential energy of an object of mass m at height h (relative to the earth's surface) is equal to mgh , where g is the appropriate constant. Now, with a bit of mathematics, they can explain why a falling object, though its speed continually increases, neither loses nor gains energy. (Some would not count this as a causal explanation strictly speaking, but it hardly matters for present purposes: it is clearly an explanation framed in terms of properties and physical laws embedded in a certain explanatory structure.) Equally, if they have a general understanding of fields, they know enough to explain the object's fall in virtue of the earth's exerting a gravitational field with an approximate potential of mgh at points close to its surface.

But although they may know these explanations, and they may be able to reproduce them on demand (in a mid-term exam, for example), it is quite possible that they do not yet entirely understand them—that they do not entirely grasp the explanatory structure that they so deftly deploy. More particularly, though they know how to apply a certain mathematical formula to calculate something called “gravitational potential energy”, they may not fully grasp what potential energy, gravitational or otherwise, is.

(Observe that, as the word “fully” suggests—and as many philosophers of understanding have remarked—grasp is surely a matter of degree. A beginning student may have no grasp whatsoever of potential energy. The student I am discussing is in a better position than that, but has a far more tenuous grasp than an accomplished physics major. And the physics major, though they have considerable grasp, might still fall short of attaining the iron grip of a thoughtful professional physicist or philosopher of physics.)

It is plausible that most of us learn theoretical concepts such as that of potential energy by passing through the awkward stage just described. We start out by developing a certain degree of formal mastery in applying the concept in certain paradigm cases: in physics classes, typically, knowledge

of a formula and how to put it to use in standard worked examples. Only subsequently (if at all) do we develop sure-footed expertise in wrangling the thing represented by this mathematics (along with, eventually, a feeling of ease and familiarity). By the time we have reached this point, we are not merely reproducing explanations but achieving understanding.⁴

Understanding arrives, then, alongside the ability not merely to think about the property of gravitational potential energy, but to grasp it. Grasp is what's added when we go from reliable regurgitation to genuine insight.

Terms like “insight”, and the metaphor of “grasp”, can make this essential ingredient of understanding seem rather mysterious. But it is not so strange. As teachers, we know how to test for grasp, by pushing our students to apply a notion outside the formal framework within which they have learned to operate—by posing those questions at the end of problem sets that come with an asterisk. A student who has a grasp of potential energy (and some understanding of Newtonian gravitation) should be able to see that “ g ” is not in fact a constant, but a quantity that decreases with distance from the earth. Or in a more advanced vein, they should be able to see that potential energy is everywhere—in the structure of a molecule such as hexane, for example, by reflecting on the ability of certain chemical reactions involving hexane to impart motion where there was none before. Such achievements show that the student has started to “get” the idea of potential energy, to see what kind of thing it is.

What, then, is grasp? This talk of seeing what a property, such as potential energy, really is suggests an account in terms of definitions and corresponding essences. On such a view, to grasp a concept of a property is to know the definition of the concept; to grasp a property is to know its essence, as spelled out by the definition.

That cannot be the complete story, however, for three reasons. First, a

4. This is a process of concept acquisition that Susan Carey (2009) has deemed Quinean bootstrapping.

dedicated but shallow student may be able to produce the sentences that articulate the relevant definition without fully grasping the significance of the definition. So it seems that we need to deploy the notion of grasp again, now to the structure and the constituents of the definition. Assuming that definitions do not go on forever, this must bottom out in an account couched in terms of grasp of elements that have no definition. Second, and related, for many properties that are central to scientific explanation, a definition-based notion of grasp cannot even get started, because these properties have no truly illuminating definitions, that is, definitions that bring the kind of expertise that we are looking for when we test our students for understanding. Potential energy is perhaps an example.

Third, even for properties that have essences or definitions, it seems possible to attain something close to complete grasp without knowing the definition at all. This is especially clear in the case of properties that are “known” in non-intellectual ways. Consider the property of doghood. Grasp of doghood is necessary, according to the simple view, to understand various scientific truths about dogs: that they are easily domesticated, or that they are susceptible to hip dysplasia. (That is because the property of doghood will, of necessity, turn up in these explanations.)

Some philosophers of biology and theoretical biologists working on the nature of species have hoped to produce a metaphysical account of properties such as doghood, that is, an account that spells out what makes something a dog, or in other words, what constitutes the essential nature of doghood. It seems clear, however, that physiologists or cognitive ethologists working to explain domestication or hip dysplasia need no familiarity with these esoteric works in order to grasp their own explanations. They already understand perfectly well what dogs are, for the purposes of scientific understanding, without having the least idea about the true metaphysics of doghood. Indeed, many researchers’ grasp of what dogs are is built on the same foundation as an ordinary person’s grasp of doghood, namely, an extensive and wide-ranging

familiarity with dogs that is not intellectual or philosophical at all.

An approach to thinking about grasp that unifies many of these considerations, and that has appealed to a number of writers about understanding, conceives of grasp as a kind of ability, or as a suite of abilities. The advanced student distinguishes themselves by answering the problems with an asterisk; the canine scientist by their knowledge about dogs and their ability to recognize almost any dog when they see it. This facility with the application of a property not only exhibits grasp, but on the ability approach constitutes grasp.⁵

Let me now return to the matter of the unity of grasp, armed with the ideas developed in this section. The problem, you will recall, is that explanatory structure consists of a number of quite different kinds of thing: singular states of affairs, properties, and entire causal (or nomological, or statistical) structures.

I offer three observations. First, lack of grasp of each of these kinds of thing seems to manifest in the same kinds of deficit. The student who fails to grasp the property of potential energy falls short in many explanatory tasks in much the same way as a student who fails to grasp the nomological structure of a gravitational field or who fails to grasp the fact that the magnitude of the earth's gravitational field varies with its distance from the earth (a matter involving a singular object, the earth's gravitational field). Furthermore, these failures are intimately related. They do not only result in the same kinds of mistakes in a problem set; they seem to issue from the same cognitive shortcomings. Now, this is not of course a decisive argument, based as it is

5. For ability-based approaches, see for example Newman (2012), Wilkenfeld (2013), Grimm (2014), Hills (2016), de Regt (2017), and for an overview, Grimm (2021). A related view equates grasp with extensive knowledge of the property in question—knowledge which of course endows the knower with many abilities (Kelp 2015). Khalifa (2017), too, frames a view of understanding on which a certain kind of knowledge plays the “grasp” role. In Strevens (2024), I propose a theory on which grasp subsists wholly in the ability to reliably identify instances of the grasped property, for example, the ability to spot dogs and to calculate potential energies.

on an untheorized hunch as to what is going on in the student's mind. But then the suspicion that grasp of a particular matter of fact must be a different sort of thing than grasp of a causal structure was itself nothing more than a hunch.

My second observation is that an ability-based approach to grasp shows how a unified theory of grasp could delineate a relation that a mind could bear to a diverse array of real-world entities such as properties, things, and structures. Consider, for example, the idea that grasp inheres in the ability to single out the grasped thing in all its aspects in a range of different situations or guises. Without developing the idea to any great extent, we can see that such an ability could exist equally for a particular entity (the earth's gravitational field), a property (gravitational potential energy), or the more general notion of a gravitational field. I take it that this omnivorous quality is one of the principal reasons for the appeal of the ability approach to grasp, though I have not seen that quality singled out or praised explicitly by previous writers.

Third—and very briefly—an ability-based approach is amenable to the thesis that grasp comes in degrees.

To sum up, the relation of grasp that figures in scientific understanding—why, I have argued, is as unified as the omnipresent word “grasp” suggests: it is a kind of cognitive ability (in the broad sense, accommodating perception and other relevant mental processes) that gives the possessor a certain deftness in their manipulation of the explanatory material, whatever kind of thing that material may be—a deftness that is missing in a student who handles all the standard problems with ease, and yet by rote, and so who falters in more advanced explanatory tasks.⁶

In the second part of this paper I will consider some other kinds of understanding, each of which raises questions about the unity of grasp that I hope to resolve.

6. I believe that this unified notion of ability reflects the view of ability theorists such as Hills (2016), although I am not completely sure.

4. Varieties of Understanding

4.1 *Objectual Understanding*

One of the central forms of understanding identified by Kvanvig's (2003) influential work on understanding is what he calls *objectual understanding*. The object of objectual understanding is a certain subject matter, such as the Industrial Revolution, the rules of basketball, or developmental psychology. An objectual understander is the quintessential expert with respect to the subject matter in question.

To have an objectual understanding of the Industrial Revolution, for example, is what a historian of that process might aspire to attain. It will typically include a certain degree of explanatory understanding—grasp of the answers to questions such as “Why did the Industrial Revolution begin in Britain in the second half of the eighteenth century?”. But it is not limited to “understanding-why”. An accomplished historian of the Industrial Revolution will have a knowledge of the chronology, of the political and economic context, and of the prevailing *zeitgeist*, perhaps extending to cultural matters such as Romanticism and the Scottish Enlightenment. On top of explanatory structures, then, objectual understanding inheres in an appropriate epistemic connection to a great store of matters of fact, ranging from simple events such as the invention of the spinning jenny to the sort of interrelated whole exemplified by the Romantic state of mind.

As a part of my unifying project, I want to argue that the epistemic connection in question is the very same mind-world connection found in scientific understanding-why. The word “grasp” has been used for both—by Kvanvig himself, for example, who argues that objectual understanding requires “the grasping of explanatory and other coherence-making relationships in a large and comprehensive body of information” (Kvanvig 2003, 192). But perhaps those two graspings are not the same thing.

There might be two reasons for skepticism. First, the material of objectual

understanding comprises diverse kinds of worldly facts, such as individuals, properties, and structures. We saw in the previous section, however, that a unified ability-based notion of grasp can connect the understander to a wide range of things of this sort. I take it, then, that this concern has been for the most part provisionally answered.

That leaves the second worry: that objectual understanding is simply a different kind of understanding than explanatory understanding (even if it has explanatory understanding as one component), and that it may therefore require a distinct kind of relationship to the subject matter—a form of insight into the worldly facts that is perhaps stronger, perhaps weaker, or perhaps simply different from the insight required for understanding-why.

What does it mean to grasp a matter of fact, then, for the purposes of objectual understanding? That is a complex and multi-faceted question—as complex and multi-faceted as the nature of matters of fact themselves. But it is at least possible to make a start on it.

Consider a reasonably central and important matter of fact that surely figures in objectual understanding of the Industrial Revolution: that GDP per capita was relatively unchanging in Europe before the Industrial Revolution, and then with the onset of the Revolution began to steadily increase.

Grasp of such a fact contributes to objectual understanding. But as before, “grasp” here merely stands in for the appropriate relationship between the mind of the understander and the fact in question. What is the nature of this mind-world connection?

It is not simply a matter of believing or knowing the fact. Imagine a student studying rather mindlessly for the history exam, who ingests the GDP fact and reproduces it in the pages of the exam without bothering to learn what GDP is. They may be said to believe and indeed to know the fact: in virtue of the “division of linguistic labor” the term “GDP” refers to that property in spite of their ignorance, and in virtue of the expertise and reliability of their instructor (or of the textbook author), their belief has all of the epistemic

qualities (reliability, safety, and so on) that are required for knowledge. But it seems clear that their knowledge of the fact contributes little or nothing to their objectual understanding, because they do not grasp what kind of thing GDP is, and *a fortiori* what it would be for GDP to remain constant or to increase.

Will it enhance the student's grasp to teach them the definition of GDP? Not necessarily. They may simply reproduce the definition on the page without grasping its meaning. Something more is required—something that looks very much like what's needed in order to grasp an explanatory structure containing the property of GDP, so as to attain the corresponding explanatory understanding. It is the sort of thing that is tested by questions that ask a student to do things with the property of GDP, displaying their understanding by distinguishing economic activities that contribute to GDP from those that do not, and all that. In short: it looks like the connection between the mind and the property of GDP required for objectual understanding is identical to the connection between the mind and GDP required for explanatory understanding. Grasp is the very same thing in both cases.

That is also true, I suggest, for grasp of structure. Consider chronological structure, a non-explanatory structure that is part of some forms of objectual understanding, and in particular of historical understanding. The kinds of questions that diagnose a student's lack of grasp of chronological structure are also the kinds of questions that diagnose a lack of grasp of, say, nomological structure. How does an object's gravitational potential energy change as it gets further from a gravitational mass (such as the earth)? To what extent does the onset of Romanticism overlap with the onset of industrialization? In both cases, it is a matter of discerning structural facts that have not been rehearsed or made explicit in the classroom or the relevant texts.

As in the discussion of understanding-why, this is hardly a bulletproof argument. It does put the burden on the doubter to find and make manifest some way in which the connection to the facts required for objectual grasp

differs from the connection required for explanatory grasp.

4.2 *Moral Understanding*

Let me next turn to the case of moral understanding, sometimes glossed in the literature as “knowing right from wrong”, or alternatively, as understanding why what is right is right and what is wrong is wrong—understanding, for instance, why torture is generally wrong but also why torture in a sufficiently dire ticking bomb scenario might not only be permissible but even obligatory (a controversial example, of course).

One influential approach to this kind of moral understanding connects it to explanation: to understand why torture is wrong is to have some expertise in explaining why torture is wrong.⁷ That suggests a “simple view” of moral understanding that parallels the simple view of scientific understanding:

To understand why a certain action (or state of affairs) has a certain moral valence is to grasp an explanation of that moral valence (in that action or state of affairs).

A moral explanation is presumably not, or not entirely, a physical or material structure, by contrast with scientific explanations. But it can be something that is from an abstract point of view rather similar: a set of facts about the action in question, a set of moral principles connecting actions to moral valence, and a structure in virtue of which the principles determine that the action has a certain moral valence.

In that case, it is *prima facie* plausible that the sense of grasp relevant to moral understanding is the same as the sense of grasp relevant to scientific understanding. Suppose, for example, that the relevant explanation turns on the notion of autonomy: such and such an action is morally wrong because it violates a certain individual’s autonomy (plus some further background conditions because it is not *always* wrong to violate autonomy, as when a passer-by

7. This is one component of Hills’s (2016) view.

tackles a would-be murderer). To attain genuine moral understanding, a thinker must presumably have the same kind of grasp of autonomy in this case as they must have of GDP in my objectual understanding example or of potential energy in my example of scientific understanding-why. Otherwise, they are merely parroting, not understanding, the moral explanation. No doubt this suggestion can be contested, but rather than push it further, let me make things more difficult for myself by considering the role of grasp in a view of moral understanding that rejects the simple view's "explanationism".

In a thoughtful and provocative paper, Sliwa (2015) has argued that moral understanding can exist independently of grasp of an explanation. To illustrate one of her arguments she introduces Julie, a person with excellent moral judgment but little explanatory capacity:

For any moral situation [Julie] finds herself in, she does the right thing because it strikes her as the right thing to do, and it strikes her as the right thing to do because she responds to the morally relevant features of the situation. I think Julie would rightly strike us as someone who has deep moral understanding. But Julie need not, also, have the abilit[y] to give moral explanations ... of her verdicts. (541)

To illustrate a related argument, Sliwa writes:

A disabled person may have a better understanding of ableism than an able-bodied person because of her experience of being disabled. But her deeper moral understanding need not be a matter of giving moral explanations. Rather, it may be a matter of being able to recognize ableism when one sees it, of giving certain considerations the moral weight they deserve, of noticing particular injustices. (545)

Sliwa's examples present a problem for the would-be unifier of grasp: they highlight a variety of understanding that, unlike explanatory and objectual

understanding, apparently does not consist in grasp of a certain structure, or indeed, in any kind of cognitive ability with respect to such structures that would confer problem-solving prowess. Could it be that Sliwa's moral understanding connects the thinker to the moral facts by an epistemic relation other than grasp? Or is grasp essentially involved even in Sliwa's kind of moral understanding?

I will argue for the latter answer by endorsing the following picture of moral understanding. As the foregoing discussion suggests, there are two kinds, at least, of moral understanding. One is moral understanding-why. The simple view gives the correct account of moral understanding-why, as it does of scientific understanding-why. The other might be called moral "understanding-that"—understanding that a certain range of states of affairs have a certain moral valence. The disabled person has strong "understanding-that" for valences connected to discrimination on the grounds of ability. Julie has it across the board. She is not merely knowledgeable, but insightful in matters of morality. Yet at the same time, she lacks a certain kind of understanding—moral understanding-why. (I should say right away that Sliwa does not herself endorse this dichotomy, and indeed that she explicitly states that understanding why an act is wrong need not involve knowing an explanation of why it is wrong.)

Above I followed the literature in giving two glosses of moral understanding: first, as knowing right from wrong, and second, as understanding why what is right is right and what is wrong is wrong. As you will see I am now proposing that these are not alternative descriptions of the same thing, but rather descriptions of two different things. Julie knows right from wrong, but she does not understand why what's right is right and what's wrong is wrong.

To complete the picture, I suggest that understanding-that be analyzed in terms of a notion of grasp. The formula is straightforward: the disabled person has a powerful grasp of moral valences connected to ableism; Julie has a powerful grasp of moral valences in every kind of situation. What, then, is

the sort of grasp involved in moral understanding-that?

It is, I propose, identical to the sort of grasp involved in objectual explanation and in scientific and moral understanding-why. A student with a good grasp of potential energy, recall, is able to reliably identify potential energy in any scenario. The student crammer with poor grasp, by contrast, is reliable only in certain paradigmatic cases explicitly rehearsed in class, and even then relies on their instructor or the textbook rather than making the judgment for themselves. Likewise, Julie is able to reliably identify the right thing to do in any scenario. Her fulsome grasp might be contrasted with the impoverished grasp of a child who believes that some things are right and others are wrong simply because they are told so, and who falters in complex cases for which they have received no explicit instruction.

What of the disabled person? Their grasp is of moral valence in one particular kind of situation. (Presumably that does not exhaust their moral grasp, but concerning the rest we remain uninformed.) They are like the student who has an excellent grasp of gravitational potential energy, but whose ability to identify other kinds of potential energy may not be so strong.

Once again, I should acknowledge that my case is far from proven. But I hope that it shows how the notion of grasp proper to scientific understanding-why can be more than serviceable in making sense of quite different varieties of understanding.

4.3 *Understanding a Theory*

I will now return to scientific understanding, but of a sort distinct from understanding-why: understanding a theory. There is, of course, an important overlap between understanding a theory and understanding why some event obtained (or other forms of understanding-why): the explanatory structure grasped in understanding-why is determined in part by the applicable theory. We decide on an explanation, that is, by taking into account the phenomenon to be explained, the local circumstances, and a theory that tells us what aspects

of the circumstances are relevant to explaining the phenomenon and how they figure in the explanation.

Even so, understanding a theory is a distinct form of understanding, as is clear from the possibility of understanding a theory that is false—even utterly false, such as phlogiston theory, the miasma theory of disease, or the theories underlying scientific racism.

We can also talk of understanding theories that, though false, are regarded as offering a useful idealized account of the phenomena, such as Newtonian physics or continuum fluid dynamics, or theories that, though regarded as debunked, contain a nugget of truth, such as the caloric theory of heat or Bohr's theory of the atom.⁸

The value of such understanding ranges widely. Understanding Newtonian physics is an essential component of modern scientific pedagogy. Understanding phlogiston theory is of historical interest alone. Understanding scientific racism has a rather different practical function for educators, political scientists, and activists. Regardless, it seems hopeless to analyze any such kind of understanding in terms of a relation between the mind and the world. When theories are false—whether usefully, quaintly, or rebarbatively—there is nothing in the world to latch on to. Or at any rate, the relevant explanatory structures are certainly not out there in the world.

As so often, the language of grasp is congenial. We can say that to understand a false theory (or indeed, a true theory) is to grasp what it says, rightly or wrongly, about the world. But this relation of grasp connects the mind to meanings, not to worldly things, properties, or structures.

That might seem like a decisive blow to a unified theory of grasp—but for one small matter. When scientific understanding-why was introduced above, almost immediately we faced a choice: should we understand the

8. Having introduced these cases, I will put aside the complex issue of the role of idealization in scientific and other understanding, which requires a more sustained treatment than I can offer here (Appiah 2017; Elgin 2017; Strevens 2017).

explanation that an understander grasps as a structure in the world or as a representation of such a structure? Causal and other “ontic” approaches to explanation suggest a worldly structure; the deductive-nomological and other “epistemic” approaches suggest a theoretical representation (Salmon 1984).

I maintained at the time that this fork in the road was of no real significance—that we can equally well think of understanding-why as consisting in grasp of real-world explanatory structure or as grasp of a theoretical representation of such structure, without it making much difference to the underlying conception of understanding. Now it is time to make good on that claim.

The short version is as follows: to grasp a property (or an individual state of affairs, or a structure) requires the very same cognitive abilities as to grasp a representation of that property (state of affairs, structure). Even if the grasping relation itself is different, then—in one case, it is a relation to something in the world, and in the other case, to a representation of that thing—the facts about the grasper that ground the relation are identical. The difference between the relations, then, is superficial; at bottom, they hold in virtue of the very same facts. In the remainder of this section, I will develop a view of what it is to understand a theory along these lines.

Let me begin by briefly bracketing the problem of false theories, while making a *prima facie* case that the same relation of grasp applies to understanding a theory as applies to understanding why.

To understand a theory, I have suggested, is to grasp what it says, rightly or wrongly, about the world. What some theories say about the world can be conceived of as the assertion of a set of regularities or laws—Newtonian physics offers an obvious example.⁹ Other theories add statements of particular matters of fact, as plate tectonics specifies the structure of a certain planet, the earth. It is not always easy to discern a theory’s content. Darwin’s theory of evolution by natural selection is a classic case (Godfrey-Smith 2009): it

9. Although there is implicit in the Newtonian framework, as it is usually formulated, a claim about space, which might be thought to concern an individual thing.

might be understood as asserting that all life is descended from a common ancestor, with the differences between various lifeforms largely due to natural selection (which in turn implies certain high-level facts about heredity and so on). Regardless, these theories are in every case making claims about the same kinds of things that turn up in explanatory structure (in some cases, very large-scale explanatory structure). It is tempting, then, to posit that understanding a theory is a matter of grasping the states of affairs asserted by a theory, using the very same notion of grasp as appears in the simple view of understanding-why.¹⁰

Now consider three objections to this view, which I call the basic proposal. Each is valid, and will prompt a substantial refinement of the view. The objections are as follows:

1. Some theories' significance is not exhausted by their factual claims. They might, for example, provide a framework for modeling certain phenomena and recommend using the framework in certain circumstances. That constitutes advice, not the assertion of fact: such a recommendation could be faulty, but it could not be false.
2. Understanding a theory is not only a matter of grasping its parts, but also of seeing how to put the parts together to build models for the purposes of prediction, explanation, and so on.
3. Finally, there is the problem of false theories. I have conceived of grasp as a relation between the mind and something in the world, such as a state of affairs in the material world or a moral precept in the normative world. But the claims made by false theories do not correspond to anything at all.

10. This view is in some ways more demanding, and in some ways less demanding, than de Regt's (2017) intelligibility approach. What follows is an expanded treatment of the notion of "understanding-with" in Strevens (2013).

To exemplify the first objection to the basic proposal, consider evolutionary theory. I gamely enumerated a set of claims that might be attributed to evolutionary theory above, but a reader might reasonably complain that this list leaves out the most important thing: evolutionary theory consists in a battery of techniques for modeling evolutionary change as a consequence of natural selection, along with a set of recommendations (perhaps partial or vague) for which models to use when. A student who understands the claims but fails to grasp the applicability or otherwise of the models has not fully understood the theory. The complaint is legitimate. It will be addressed in time by using resources developed to deal with the two other objections, to which I now turn.

The second objection to the basic proposal is in effect asking for something more holistic to be added to grasp of the individual parts of a theory. We might try to satisfy this demand, partially, by turning to the holistic aspect of the account of understanding-why, namely, the notion of an explanatory structure. In my presentation, an explanatory structure is a complex relational state of affairs in the material world. A part of grasping such a structure is grasping the causal or other explanatory relation that holds between the parts of the explanation, that is, between the individual states of affairs, the regularities or laws, and the explanandum. The second objection, I think, wants a grasp of such structures in general to be added to the criteria for understanding a theory. Let us do so. (And let us add, if desired, “predictive structures”, that is relations between aspects of the world picked out by a theory that make predictions in a non-explanatory way.)

That does not fully answer the objection, however; there remains a difficulty. To fully understand a theory’s explanatory potential appears to require us to grasp explanatory structures that, while possible, turn out not to be actual. Or to put the thought in plainer language: a part of understanding a theory is to appreciate all the ways that it might be used to explain (or predict), even those that do not pan out. That, of course, leads us to the third objection,

the problem of false theories.

I will come back to the first two objections soon enough; at this stage, however, let me take on the third objection by posing the question of what it is to grasp a radically false theory such as the phlogiston theory of combustion. I have interpreted grasp as a relation between a reasoner and things in the world: individuals, properties, laws, anything real. But what, then, about unreal things? To simplify the question, focus on grasp of unreal properties such as phlogiston (more exactly, the property of being phlogiston, or phlogistonhood).

It is tempting to unpack a student's or a historian's grasp of phlogistonhood as the ability to detect phlogiston, to explain events in terms of phlogiston, the ability to use phlogiston to achieve certain aims, or some combination of these things—were there to be such a thing as phlogiston in any sense. There are semantic niceties to be negotiated here: if phlogiston is merely an uninstantiated property, that is, a real property with no actual instances, then all is well, but many philosophers will want to say that the term “phlogiston” is empty, and thus that there is no corresponding property at all. We cannot teleport our thinker to possible worlds where phlogiston theory is true and see whether they deal deftly with phlogiston; there simply are no such worlds.

We can do something similar, however. We can go to a world where the sentences of phlogiston theory would have been true—a world where, to put it in terms of two-dimensional semantics (Chalmers 2006), the “primary intension” of phlogiston picks out a real property—and test our thinker's powers there.

Another approach begins with concepts. The thinker with the better grasp of phlogiston, we will say, is the one who has greater mastery of the concept of phlogiston.

As I observed when introducing grasp in the context of the simple view of understanding-why, this conceptual strategy can also be used to characterize grasp of nonfictional properties: what the grasper of potential energy

possesses, and the crammer lacks, is mastery of the potential energy concept. Thus, the conceptual approach has the advantage of giving us a unified account of grasp both of false theories and of the things that appear in true theories.

Many of the best-known ways of understanding conceptual mastery have a familiar ring: to master the concept of a property is to know the essence of the property, to have a great deal of knowledge about the property, to be disposed to make certain inferences concerning the property, to have a broad suite of cognitive abilities with regard to matters involving the property, or to be a reliable recognizer of the property.¹¹ Some of these views will have to be amended for concepts of nonexistent properties. If the term “phlogiston” is empty, there can be no knowledge about phlogiston, and no abilities to navigate around and to manipulate phlogiston.

The amendments will presumably take the approach suggested above: as the basis for mastery of a defective concept such as that of phlogiston, we will look for knowledge and abilities in the sort of world where the sentences of phlogiston theory would have been true, or in other words, worlds in which the primary intension of phlogiston picks out something real. The project of developing this incipient idea is a substantial one; I won’t try to take it any further here. What matters is that there is a clear path forward; grasp of non-existent properties, and more generally of false theories, is well within our philosophical reach, and is achieved in the same way—using what are in narrowly psychological terms the same abilities—as grasp of real properties and true theories.

Let me now return to the first two objections to the basic proposal. The second objection prompted me to require that, in order to fully understand a theory, the would-be understander should grasp not only the theory’s individual components, as required by the basic proposal, but also the many explanatory (and predictive) structures that might be built using the theory—

11. On ways of thinking about conceptual mastery, Rabin (2020) offers a useful survey and critique.

including promising explanations that, though well constructed, turn out to be incorrect. The response to objection three completes my formulation of this requirement by making sense of grasp of an incorrect explanatory (or predictive) structure.¹²

The first objection was that understanding a theory involves understanding frameworks for building models that are more like recommendations than assertions. To answer the objection, we can equate frameworks with sets of potential explanatory and predictive structures, and grasping a framework with grasping those structures. Then we add to the criteria for understanding a theory that the thinker should have some facility (the more the better) with using those structures in the right circumstances.

To sum up, then, understanding a theory, true or false, useful or hopeless or pernicious, is a matter of grasping the components of the theory along with the explanatory and predictive structures that can be constructed from the theory, and acquiring expertise as to where those structures may or may not be fruitfully applied.

4.4 *Humanistic Understanding*

There are many other varieties of understanding. The tools introduced in this paper will, I hope, show how to apply a univocal notion of grasp to each. On the resulting view of understanding, the subject matter, or structure, or set of propositions or sentences that must be grasped for understanding varies from type to type, but the nature of grasp is in each case the same.

Consider, for example, understanding of another person or group's point of view, which is a component of what is sometimes called "humanistic understanding".¹³ I don't pretend to offer any substantive view of this complex

12. The greater the range of explanatory or predictive structures grasped, the greater the thinker's understanding of the theory. This introduces a graded aspect to understanding a theory that is independent of the graded aspect of grasp itself.

13. For an overview with further references, see Grimm (2021), §5.

phenomenon, but very schematically, you might suppose that it involves grasp of certain “hermeneutic structures”—namely, the structures that the person or group uses to make sense of the world—that contain representations of particular states of affairs and principles connecting them, both causal and evaluative. These representations, like the representations that make up a modeling framework in science, may or may not be tethered to reality. Regardless, to understand the person or group’s point of view is to grasp a representation of the relevant hermeneutic structure.

That the relevant form of grasp is constituted by the same sort of cognitive ability as the grasp found in the other forms of understanding considered in this paper is suggested by the symptoms of its absence. Just as mere reproduction of a scientific explanation is not sufficient for understanding—why if the thinker does not fully grasp the concepts or properties that power the explanation—potential energy, GDP, and so on—so reproduction of another person’s credo or belief system is not sufficient for understanding the corresponding point of view, if key notions in the point of view are not grasped in exactly the same sense—think of *mana* and *whakapapa* in Maori culture, for instance, or *li* in neo-Confucian thought, or *ubuntu* in certain southern African worldviews.¹⁴

An aspect of humanistic understanding that might seem to be missing from this picture is the first-person or affective dimension—the sense in which you must, in order to attain the very deepest understanding of another person’s outlook, “reenact” subjectively the “what it is like” of caring about the things they care about (Collingwood 1946; Stueber 2006).

It is controversial, of course, to hold that such first-personal states of mind contribute to understanding. (The thesis seems to render complete understanding of, say, a slave-holder’s point of view a potentially repugnant exercise.) But I don’t wish anything I say in this paper to rule it out. Let me

14. If a complete grasp of these concepts is unattainable for a thinker from another culture, then that thinker will never fully understand the corresponding points of view.

assume for the sake of the argument, then, that understanding a point of view may involve “first-person” understanding.

A full account of this sort of understanding does seem to require a mind-world connection that is qualitatively different from the purely intellectual grasp involved in scientific understanding. (Phenomenological approaches to understanding (Bourget 2017; McSweeney 2023) may be of some use in accounting for such a connection, as they may be useful to other forms of understanding that require familiarity with “what something is like”.) Even if that is true, however, I maintain that alongside “affective grasp”, understanding requires intellectual grasp. There is no understanding of a point of view, then, without intellectual grasp of the relevant hermeneutic structure—even if for some purposes, that grasp is not sufficient on its own to confer full understanding.

5. Conclusion

It might be thought that the consensus that “grasp” plays a critical role in many kinds of understanding is superficial, even purely verbal. I have argued for the rather more substantial conclusion that a unified notion of grasp is essential to a wide variety, perhaps even to all varieties, of understanding with which we are familiar.

Much of the argument has consisted in the examination of problem cases—varieties or aspects of understanding that create the *prima facie* appearance of disunity—and in showing that in all such instances, the relation of grasp that is found in scientific understanding—why can do the work of connecting the mind to the world (or to a representation of the world).

I have avoided as far as possible advancing a substantial positive conception of grasp. I have, however, endorsed an ability-based approach, and I have found in that approach a diagnostic of lack of grasp based on our usual pedagogical techniques for assessing understanding, namely, by posing questions that depart from the standard “problem sets” in various significant ways. The

validity of the same diagnostic in many different situations suggests that the same kind of ability, at root, is being tested for in every case.

That does not, of course, amount to a decisive argument for the thesis that supplies my title—that there is a single notion of grasp universally required for understanding. I hope, nevertheless, to have bolstered the plausibility of the thesis and to have shown the way past many obstacles, thereby taking a step on the road to a full-fledged theory of understanding.

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