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Understanding
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Understanding comes in a variety of forms, and many of its forms are highly prized. According to many philosophers of science, for example, understanding is the good at which scientific inquiry aims.¹ On this way of looking at things, what scientists want, when they begin their inquiries, is not just to acquire a range of true beliefs about the world; rather, their goal is to understand the world (or at least some part of it), where understanding the world involves something more than the acquisition of true beliefs. More generally, and looking outside of science, understanding is often said to be one of the great goods that makes life worth living. Thus according to value theorists such as James Griffin, understanding stands as one of the few goods—along with accomplishment, pleasure, and deep personal relations—that deserves to be thought of as an intrinsic good.²

There are thus a few different questions we might ask about understanding. For one thing, we might ask about the *value* of understanding. For example, does understanding really deserve to be thought of as an intrinsic good? For another, we might ask about the *nature* of understanding. For example, understanding clearly seems to be a kind of cognitive accomplishment of some kind—but what kind of accomplishment is it, exactly?

Although questions concerning the value of understanding have recently gained attention,³ in this entry I will mainly focus on the nature of understanding rather than its value. What's more, although the concept of understanding covers a vast amount of ground,

¹ See, for example, Salmon (1998), Lipton (2004), and Strevens (2006). Unsurprisingly, the claim is also common among scientists themselves (see, e.g., Weinberg 1994).

² See Griffin (1986, ch. 4)

³ See, for example, Elgin (1996; 2006), Zagzebski (2001), Riggs (2003), Kvanvig (forthcoming), and Pritchard (forthcoming).

in this entry I will address only a relatively narrow slice of it. As Catherine Elgin aptly notes, we understand (or fail to understand) many different kinds of things:

We understand rules and reasons, actions and passions, objectives and obstacles, techniques and tools, forms, functions, and fictions, as well as facts. We also understand pictures, words, equations, and patterns. Ordinarily these are not isolated accomplishments; they coalesce into an understanding of a subject, discipline, or field of study. (Elgin 1996, p. 123)⁴

This entry, however, will focus almost entirely on our understanding of the natural world (broadly understood), and little will be said about how—if at all—the approaches on offer here might relate, for example, to the kind of linguistic understanding we have of concepts or meanings. Likewise, very little will be said about the sort of understanding that we can acquire of human actions—or, more generally, of the products of human actions such as works of art. Although these presumably qualify as part of the natural world in some sense, the way in which we achieve understanding in these areas seems different enough that it deserves to be dealt with separately.⁵

I will approach the nature of understanding in three main steps. First I will ask about the *object* of understanding, second about the *psychology* of understanding, and third about the sort of *normativity* that is constitutive of understanding.⁶ Along the way, I will also regularly ask how understanding compares with knowledge in all of these respects. According to some philosophers, for example, understanding differs from knowledge on virtually every point: it has different objects, incorporates a different psychology, and has

⁴ See Salmon (1998) for another helpful taxonomy of kinds of understanding.

⁵ In the Continental tradition, moreover, an attempt is often made to distinguish between *erklären* (or explanation) and *verstehen* (or understanding), where the former is thought to be more appropriate to the natural sciences and the latter to our understanding of human thought and action. See, for example, Dilthey ([1894] 1976).

⁶ This approach is modeled on traditional accounts of the nature of knowledge. On a justified true belief account of knowledge, for example, we are given information about the *object* of knowledge (a true proposition), the *psychological attitude* we need to bear towards this object (belief), and the sort of *normative relationship* that obtains between the two (a relationship of justification, however exactly that is spelled out).

different normative requirements. Whether these differences are as clear as has been suggested, however, is something I will question as we proceed.

1. Objects of Understanding

As we consider the object of understanding, the first thing to notice is that understanding can apparently take a variety of objects, corresponding to the variety of grammatical complements that are available to the verb “understands.” Consider, for example, the following sentences:

- (1) Mary understands that her class starts in an hour.
- (2) Mary understands the New York City subway system.
- (3) Mary understands why the coffee spilled.

With examples along the lines of (1), where “understands” takes a that-clause as its complement, it is commonly thought that the object of understanding is something like a Fregean proposition. As several authors have noted, moreover, ascriptions of understanding along the lines of (1) seem to be more or less synonymous with corresponding ascriptions of knowledge. Thus on most occasions it seems that we can substitute “S knows that p” for “S understands that p” with little loss of meaning; or, if there is a difference in meaning, it seems to derive from the fact that “understands” has more of a hedging connotation, one that suggests an openness to correction.⁷

As we turn to examples such as (2), however, complications arise, and the comparisons with knowledge become less clear. Consider, for example, what a parallel sentence about knowledge might look like:

- (4) Mary knows the New York City subway system.

⁷ See, for example, Brogaard (2008), Kvanvig (forthcoming), Pritchard (forthcoming), and Elgin (forthcoming).

As Brogaard (forthcoming) and others have pointed out, (4) requires some care because it is ambiguous.⁸ Depending on context, at least three different senses of “knows” might be expressed.

First, the claim might be read so that the object of knowledge is the subway system itself, the concrete thing.⁹ In this sense, the claim would express some sort of relationship of acquaintance between Mary and the subway system.

Second, it might be read so that the object of knowledge is a group of propositions. In this sense, (4) would express a relationship of knowledge between Mary and a group of propositions *about* the subway system. Thus someone who has never even laid eyes on the subway system might nonetheless know a great deal about it; its history, its routes, and so on.¹⁰

For our purposes, however, the most interesting way in which (4) might be read, and the one which helps to shed light on what seems distinctive about the sort of understanding we find in (2), is in yet a third sense. It is this third sense that would be operative, for example, if someone were to say, “Well, Paul (as opposed to Mary) might know a lot *about* the system, but he doesn’t really *know* the system.” In this sense, when we say that someone knows a lot about X but he doesn’t really know X, we are not claiming that the person does not stand in a relationship of acquaintance (or the like) to X. Instead, what we are claiming is that while the person may know a lot about X, nonetheless he doesn’t really know how X

⁸ Brogaard, however, identifies only the first two senses of “knows” discussed below, and not the third.

⁹ Or at least some part of it. This qualification should be understood in what follows. If one wanted to substitute the subway system for an object that is more easily taken in or apprehended, one could substitute a different object, such as (say) one’s desktop printer.

¹⁰ Another possibility, suggested to me by my colleague Bryan Frances, is that it is not the objects in these cases that differ but rather only something like the “paths” to the objects. Thus the object in the acquaintance case would be the subway system itself, and the object is the “knows a great deal about” case would again be the subway system, but via a propositional path or route. Two quick points about that: first, if this is right, then the distinction to be drawn here would not be at the level of objects but instead at the level of “paths.” Second, there is reason to be worried about doing away with propositions as objects of belief (rather than as “routes” to concrete things and properties, or something like that): namely, the traditional worry that false beliefs (and especially, beliefs about things that do not exist, like Bigfoot) would then seemingly lack objects.

works. That is to say, he doesn't really know how the different parts or elements of X are related to, and depend upon, one another. Thus we might likewise say, for example, "Well, Paul might know a lot about Congress, but he doesn't really *know* Congress." Or: "Paul might know a lot about hydrodynamics, but he doesn't really *know* hydrodynamics."

For the time being, let us think of this sort of knowledge as a kind of *know-how*—that is, knowledge that consists in knowing how a thing works, or how the various parts of a thing relate to and depend upon one another. Now, it might be thought that this sort of knowledge can in fact be reduced to a special kind of propositional knowledge: perhaps, propositions *about* how a thing works.¹¹ I will have more to say about (and against) this sort of reduction below, but for the moment it will help to explore a different idea, one that draws inspiration from the following sort of question: namely, what is it that might make things as diverse as the New York City subway system, Congress, and hydrodynamics the proper *objects* of know-how? And the key thing to appreciate here, plausibly, is that if know-how implies an apprehension of how a thing works, then it seems to follow that the object of the know-how must be constituted by a structure that can *be* worked—that is, that can be worked to determine how the various elements of the thing relate to, and depend upon, one another. At first blush, then, it seems plausible to think of the object of this third sort of knowledge is a structure or system of some kind; at any rate, the sort of thing with "moving parts"—that is, parts or elements that are open to taking on different values and hence of being worked.

So much for these different ways in which claims along the lines of (4) might be understood. How does this shed light on claims about understanding such as (2)? One promising thought is that the object of understanding in (2) can profitably be viewed along

¹¹ For proponents of reduction, see Stanley and Williamson (2001). For criticism, see Schaffer (2007).

the lines of the object of know-how just described.¹² In other words, the thought is that the object of understanding in (2) can profitably be viewed as a kind of system or structure—something, that is, that has parts or elements that depend upon one another in various ways.

But what sort of structure best fits the bill here? It seems we have at least three possibilities. First, we might say that the object is the actual, concrete structure that makes up something like the subway system: the concrete tracks, cars, switch boxes, and all the rest. Second, we might say that the object here is an abstract representation *of* the system—perhaps in the sense of a model of the system, or perhaps in the sense of structural equations that encode information about how the various aspects (or properties) of the system depend upon one another. Finally, we might say that understanding can take a variety of objects, both concrete and abstract; this would be a pluralist view of the object of understanding.

Although we do not need to try to settle the matter here, it is worth pointing out that “abstract” view seems to have at least two points in its favor. First, thinking of the object of understanding in cases such as (2) as an abstract representation helps to make sense of the kind of understanding we can enjoy of things that presumably lack a concrete basis. Thus on this way of looking at things we can make ready sense of the claim, for example, that “Bullfinch understands Greek Mythology,” or that “Priestly understands phlogiston theory”; on the “concrete” view, it is not at all clear what the object of understanding might be in these cases. Second, the “abstract” view seems to provide us with ready truth-evaluable

¹² Philosophers such as Zagzebski (2001) and Hasok Chang (forthcoming) have gone farther, suggesting that understanding just is a kind of know-how. According to Chang, for example, “Understanding, as I see it, is not some distinct quality or state of mind that exists separately from the sense of knowing how to do epistemic things. Understanding is simply knowledge taken in the active sense” (Chang forthcoming, p. 15, typescript). Others, such as Peter Lipton, seem to disagree, instead preferring the idea that understanding is a kind of knowledge that. Thus Lipton writes: “Understanding why is a kind of knowledge that – whether of causes or modal facts or connections” (Lipton forthcoming, p. 25, typescript.)

content, of the sort that our talk about understanding seems to require. Thus we commonly say, for example, that someone's understanding was inaccurate, or flawed, and so on. But it hardly makes sense to speak of something like the subway system itself (the concrete thing) as inaccurate,¹³ so this too suggests that the object is not concrete but abstract—a representation of the system, rather than the system itself.

As we turn now to examples such as (3), where someone understands *why* such-and-such occurred, identifying the object of understanding is again not straightforward.

It will help to start, at any rate, with a specific example.¹⁴

Suppose, then, that you are settling into a seat at your local coffee shop. As you turn to look at the table next to you, you notice a woman sitting with a hot cup of coffee. Second later, moreover, you see her knee accidentally jostle her table, leading to a messy spill.

Without going into the details just yet, suppose for the moment that you now understand why your neighbor's coffee spilled, and that your understanding has something crucially to do with your ability to identify the jostling as the cause of the spill. But what exactly is the object of your understanding here?

The basic problem with trying to answer this question is that while from a grammatical point of view it seems clear that the complement of "understands" is an indirect question, from a metaphysical point of view things get murky. For one thing, it is not clear that questions (indirect or otherwise) even have metaphysical correlates.¹⁵ For another, and even supposing they do, it is not clear what such correlates might be.

¹³ Flawed maybe, but not inaccurate.

¹⁴ Inspired loosely by Scriven's (1962) well-known, though now rather outdated, ink well example.

¹⁵ Put another way, it is not clear that when one states a question, one is affirming (grasping, assenting to, etc.) some way the world might be. Now, perhaps the presuppositions of questions have such metaphysical correlates. But, again, it seems odd to suppose that the questions themselves do.

Perhaps motivated by concerns along these lines, some philosophers¹⁶ have argued that cases of “understanding why” such as (3) can and should be reduced to cases of “understanding that.” More exactly, the claim is that ascriptions along the lines of “S understands why such-and-such” in fact express propositions of the form *S understands that p*,¹⁷ where *p* represents a correct answer to the indirect question embedded in the ascription of understanding. On such a reductive analysis, then,

(i) Mary understands why the coffee spilled

just in case

(ii) Mary understands (or knows) that *p*, where *p* is a correct answer to the question

“Why did the coffee spill?”

One benefit of this proposal is that we now have a natural object for instances of understanding why such as (3): namely, the proposition *p*, where we can suppose that *p* is something like *that the coffee spilled because of the jostling*.

But is this really a satisfying reduction? Does (ii) really capture what we find in (i)? To see why these questions should give us pause, note first that it seems we can know a proposition of the sort we find in (ii) in a very ordinary sense of “know” while nonetheless falling short of the sort of accomplishment that we naturally associate with understanding why.¹⁸ For instance, on the basis of your reliable testimony I might come to believe, and hence know, that the coffee spilled because of the jostling. But possessing this knowledge, it seems, is compatible with a general inability to answer a wide range of questions that intuitively go along with the state of understanding why. Suppose, for example, you ask me whether a more forceful strike by the woman’s knee would likewise have led to a spill. Or

¹⁶ See, for example, Kvanvig (2003; forthcoming).

¹⁷ Alternatively, and perhaps more naturally, one might say not that cases of *understanding why* can be reduced to cases of *understanding that* but rather to cases of *knowledge that*.

¹⁸ For more on this line of thought, see Grimm (forthcomingb). De Regt and Dieks (2005) also stress the connection between understanding a theory and being able to apply the theory.

whether a spill would have occurred had there been no jostle of any kind. Although the achievement we associate with understanding why seems to bring with it the ability to answer questions of this sort, strictly speaking it seems one can have knowledge of the cause—again, based on reliable testimony—without possessing these additional abilities at all.

The “strictly speaking” qualification is important, for the thought here is not that, as a matter of fact, coming to believe a claim along these lines is usually accompanied by an inability to answer questions of this sort. The claim is only that it might be accompanied by such an inability. Moreover, the thought is that when an ability to answer questions of this sort is present, this seems to be the result of some sort of additional cognitive work—work that goes above and beyond the sort of work that goes into acquiring knowledge by testimony, for example.

The next section will consider just what sort of additional cognitive work needs to be done here, exactly. In bringing this section to a close, however, we can make one final point: namely, that it is now possible to see ways in which cases of understanding along the lines (2) share certain important, and often ignored, similarities with cases of understanding along the lines of (3). In particular, we can now see that the object of understanding in both cases is more similar than we might have originally supposed.

For notice: if someone understands why the cup spilled rather than remained upright, then presumably she in some way “grasps” or “sees” what it is that makes the difference between these alternatives. In other words, she in some way “grasps” or “sees” what the difference between these alternatives depends on. But if that is the case, then interesting parallels with cases of understanding along the lines of (2) begin to emerge. For just as cases understanding such as (2) involve “grasping” how the various parts of a system depend upon one another, so too with cases such as (3) we find that understanding arises

from “grasping” or “seeing” what the difference between certain alternatives depends upon. Plausibly, then, we might think of the object of understanding in cases such as (3) as a kind of “mini” representational structure, where the structure encodes information *about* how the various elements of the target system depend upon one another.¹⁹

In both cases such as (2) and cases such as (3), accordingly, the common hallmarks of system or structure seem to be present in the object of understanding, despite the differences in surface grammar. As we turn to the psychological element of understanding, our main concern will be to try to flesh out the notions of “grasping” and “seeing” that have played a recurring role in the discussion so far.

2. Psychology

The psychology of understanding is multi-layered. On the one hand, there is clearly something like an attitude of belief or assent involved. The sort of abstract structures that (at least sometimes) appear to be the object of understanding, after all, presumably represent the world as being a certain way, and if we take the representation to be accurate, we are in some sense assenting to these structures or saying Yes to them—just as when we take a proposition to be true we are in some sense assenting to or saying Yes to it. On the other hand, we have also seen reason to think that an element of belief or assent cannot be all there is to understanding. We can take it to be the case, for example, that a model is accurate—we can assent to it in that sense—and yet we might nonetheless not “grasp” or “see” how the various parts of the model relate to one another, where the element of grasping or seeing seems to involve an additional psychological ability.

Further complications arise, moreover, when we remember that many representations are highly idealized. On the ideal gas model that is typically used to explain

¹⁹ Perhaps in the way suggested by theorists such as Pearl (2000), Spirtes *et al* (2001), and Woodward (2003).

Boyle's Law, for example, gas molecules are (inaccurately) represented as point particles, and the long range attractive forces between molecules are ignored. In this case, assenting to the model—in the sense of taking it to be an accurate representation of the world—will often involve subtle qualifications on the part of the assenter.

I will touch on a few of these complications as we proceed, but for the most part in this section I will focus on the element of “grasping” or “seeing” that seems to be so integral to understanding in all its forms. And the main thing I would like to try to do here is to move our understanding of these expressions beyond the level of mere metaphor, in order to try to get a better sense of the sort of psychological ability that lies behind, or perhaps constitutes, the graspings and seeings.

Now, in their primary (non-metaphorical) senses “grasping” is something that hands do, and “seeing” is something for eyes. We speak of manually grasping something, moreover, in at least two different ways: on the one hand to grasp a thing is to seize or take hold of it, as when we grasp (say) a baseball; on the other hand we speak of grasping a thing when we are able to manipulate or tinker with a thing, as when we grasp (say) a simple lever system by manually switching the lever from one position to another. Indeed, in this second, manipulationist sense the notions of (manually) grasping and (visually) seeing go together very naturally: if the system is simple enough, when one grasps or manipulates one part of the system one can then literally “see” the way in which the manipulation influences (or fails to influence) other parts of the system.

Given these two senses in which we might manually grasp a thing, moreover, even though the first sense is perhaps the more common one, it seems that the psychological act of grasping that is of interest to us here can most usefully be thought of along the second, manipulationist lines. In this sense, *mentally* to grasp how the different aspects of a system depend upon one another is to be able to anticipate how changes in one part of the system

will lead (or fail to lead) to changes in another part. To “grasp” the way in which something like the spilling of the cup depends on the jostling of the knee in this sense is thus to have an ability to anticipate or “see” what things would have been like, had the knee bump not occurred, or had the bump had been less forceful, or had it been a fist bump instead, and so on.²⁰ “Grasping” a structure would therefore seem to bring into play something like a modal sense or ability—that is, an ability not just to register how things are, but also an ability to anticipate how certain elements of the system would behave, were other elements different in one way or another.

We noted at the beginning of this section, however, that the act of grasping or seeing cannot be all there is to understanding. For we might grasp a representation in a straightforwardly assenting way, as when we take the representation to be the sober truth about the system it represents. But we might also grasp the representation in a qualified or non-straightforward way. This sort of qualified assent seems to be at play, for example, when we say things such as “for Priestly, the lighting of the tinder was due to the presence of phlogiston”; or perhaps: “supposing that Priestly was right, the lighting of the tinder was due to the presence of phlogiston”; and so on. Similar qualifications are typically in place when we grasp something like the ideal gas model, or when we learn to apply this model to Boyle’s Law. Thus we learn to say: supposing that the gases were point particles, or supposing that no intermolecular forces were present, then *this* is how the system would behave. In these cases, we seem to assent to a representation only with certain qualifications in place, or with certain presuppositions in mind.

Of course, this leaves us with a variety of interesting questions (for example, how does our grasp of how the target system *would* behave, if certain properties were otherwise,

²⁰ Ceteris paribus, etc. James Woodward’s (2003) idea that understanding should be unpacked in terms of having an ability to answer “What if things had been different?” questions is another way to construe this thought.

help us to understand the system as it actually is?²¹), but these will have to be set aside here as we turn instead to ask about the last element of understanding identified at the outset: namely, the sort of normativity that is constitutive of understanding.²²

3. Normativity

As we consider the sort of normativity that is constitutive of understanding, it will help to look again to accounts of knowledge as a kind of template.

When we are evaluating whether a belief amounts to knowledge, we can ask two different sorts of normative questions. On the one hand, we can ask whether the belief is *subjectively appropriate*, where subjective appropriateness has to do, roughly, with whether the belief “fits” with the rest of the person’s evidence (where “evidence” can be construed broadly to include the person’s experiences as well as his or her beliefs). On the other hand, we can ask whether someone’s belief is *objectively appropriate*, where objective appropriateness has to do, roughly, with whether the belief is, as a matter of fact, reliably oriented to the truth.²³

On the standard way of looking at things, moreover, both sorts of appropriateness are required for a belief to amount to knowledge. When it comes to understanding, however, opinions differ. According to some theorists, for example, while there are objective appropriateness conditions on understanding, they are noticeably different—and apparently less strict—than the conditions on knowledge.²⁴ According to others, only subjective appropriateness really matters to understanding—a view which makes the achievement of understanding almost entirely an “internal affair.”

²¹ For more on this question, see Cartwright (2004).

²² For more on the notion of “grasping” see Grimm (forthcominga)

²³ Fogelin (1994) and Greco (2000) helpfully emphasize these two different types of evaluations.

²⁴ See, for example, Elgin (2004; forthcoming).

To see why one might think that only subjective appropriateness really matters to understanding, consider the following variation on our earlier coffee shop case. Suppose that while you are watching your neighbor spill her coffee, a visiting shaman is sitting in another corner of the shop, taking the whole scene in. He notices the jostling, sees the cup spill, and all the rest. From his point of view, however, it was not the jostling that caused the spill but rather the fact that he willed the cup to spill seconds before (perhaps he thinks he has powers of telekinesis or something comparable).

Suppose moreover that the shaman has good, albeit misleading, reasons to believe he has such powers (perhaps people have always humored him in the past). In that case, it seems that it will be subjectively appropriate for him to believe that it was his powers that made the difference to the spill. We can also imagine that he not only assents to this claim but that he “grasps” how the spill depended on his powers in the way sketched above. For example, he will “grasp” or “see” that, in the absence of his willing the spill would not have occurred (*ceteris paribus*). But now: what should we say about the shaman? Does he understand or fail to understand why the cup spilled?

Although I take it that in one sense it seems obvious he does not understand why the cup spilled, it is worth noting that there is at least some conceptual pressure to think otherwise. Consider, for example, Lynne Rudder Baker’s suggestion that “Understanding is more comprehensive than knowledge. To understand something is to know what it is and to make reasonable sense of it” (Baker 2003, p. 186). If Baker is right, and understanding something amounts to knowing what is the case²⁵ and to making reasonable sense of what is the case, then it would seem to follow that the shaman *does* understand. Again, we can suppose that the shaman’s story about the spill makes excellent sense to him, in light of the

²⁵ This way of putting things changes Baker’s “knowing what a thing is” formula slightly, but seems to be the same idea.

rest of what he believes; alternatively, it “fits” with the rest of what he believes, and so on. Looked at charitably, we can even recognize the shaman’s achievement as a genuine cognitive accomplishment. The various kinds of “seeing” or “grasping” we have just described do not come for free, after all, and someone who has made reasonable sense of a thing, given the rest of what he believes, has indeed accomplished something. And what kind of name do we have for this sort of “seeing” or “grasping”-based accomplishment if not understanding?

Rather than try to downplay or ignore this sort of accomplishment, however, following Wesley Salmon we might instead try to introduce a distinction.²⁶ Let us think of *subjective understanding* as the kind of understanding one achieves by grasping a representation of the world²⁷ (a model, perhaps, or an explanatory story of some kind) that fits or coheres with one’s “world picture.”²⁸ On the other hand, let us think of *objective understanding* as the kind of understanding that comes not just from grasping a representation of the world that fits with one’s world picture, but also from grasping a (more or less) *correct* representation of the world. Objective understanding therefore entails subjective understanding but goes beyond it, requiring that the grasped representation in fact obtains.

This therefore suggests that there at least two normative conditions on objective understanding. First, that the representation of the world that is grasped be correct (more or less). And second, that the attitude of assent or grasping be subjectively appropriate, given the rest of the person’s evidence.

²⁶ See, for example, Salmon’s (1998) distinction between cosmological and mechanical understanding.

²⁷ Or some part of it; that qualification should be understood in what follows.

²⁸ As the discussion so far has suggested, other iterations are also possible. One might require not just that there story grasped actually fits or coheres with one’s world picture but that one can “see” or “grasp” that there is a fit, where presumably this last sort of seeing or grasping will involve seeing or grasping that some sort of inferential relationships hold. Thanks to Mark Newman for helping me to see the difference between these possibilities.

But are there other normative conditions on objective understanding? As noted earlier, when we look at knowledge we find that believing the truth with subjective appropriateness is not enough; in addition, the belief must be securely connected to the truth in some way. We might think of this as the “anti-luck” condition on knowledge. According to Jonathan Kvanvig (2003; forthcoming) and Duncan Pritchard (forthcoming), however, understanding is compatible with luck in a way that knowledge is not. For both, then, the objective appropriateness conditions on understanding are different than the objective appropriateness conditions on knowledge.

Kvanvig first argued for this claim by means of the following example.²⁹ Suppose you come across a book detailing the Comanche dominance of the southern plains of North America from the seventeenth to the nineteenth centuries (Kvanvig 2003, p. 197). But suppose as well that while all of the contents of the book are true they are only “accidentally” so. Perhaps, for example, the book was put together as a joke by someone who did no research at all, but just happened to get everything right.³⁰

Now suppose you read the book carefully and come to grasp (in an assenting way) the central explanations offered by the book: for example, suppose you come to grasp that the Comanches dominated in part because of their superior horsemanship. According to Kvanvig, what we have here is a “grasp” that genuinely amounts to a case of understanding, even though one would fail to know the corresponding propositions. (Where the corresponding propositions would apparently include things like: *that the Comanches dominated because of their superior horsemanship.*) One would not know these

²⁹ See Kvanvig (2003, pp. 197-98). For another example along these lines, where we have a case of fortunate dyslexia, see Kvanvig (forthcoming, p. 8, typescript).

³⁰ I should note that I am filling in the details about how the correct information “accidentally” comes your way. As Pritchard notes, and as we will consider in a moment, there are in fact two ways to read Kvanvig’s claim here. On my way of filling in the details, we have an instance of understanding that is compatible with “Gettier-style” luck.

propositions, according to Kvanvig, because it would be a mere matter of luck that an accurate book landed in your hands, and luck rules out knowledge.

According to Pritchard, however, while Kvanvig is right to claim that there can be lucky understanding, Kvanvig overstates the case because he fails to distinguish between two different types of epistemic luck: on the one hand, what Pritchard calls “Gettier-style” epistemic luck, and on the other hand what he calls “environmental luck.” On Pritchard’s view, Gettier-style epistemic luck occurs when something intervenes “betwixt belief and fact,”³¹ as when your belief that there is a sheep in the field turns out to be right, but only because you happened to be looking at a sheep-like dog, rather than the (hidden-from-view) sheep itself. With environmental luck, by contrast, although nothing comes between belief and fact, the environment itself conspires to take away knowledge. The Ginet/Goldman barn façade case is the classic example of this sort of luck—one in which there is a direct causal path between one’s belief that there is a barn nearby and the corresponding fact, but where the presence of nearby fake barns makes the fact that one believed the truth seem like a matter of luck.

On Pritchard’s view, moreover, while it is right to say that understanding is compatible with environmental epistemic luck, it is wrong to say that understanding is compatible with Gettier-style epistemic luck. Unlike Kvanvig, Pritchard takes it to be obvious that a bunch of made-up facts, even if they turn out to be accurate, cannot grant one a genuine understanding of how the world works. Nevertheless, Pritchard claims that objective understanding can survive *environmental* luck. Suppose, for example, that the history book you happen to consult is the product of rigorous scholarship, but that the majority of the books that you might easily have consulted are full of lies (perhaps you live

³¹ The expression is Pritchard’s, though he attributes it originally to Peter Unger.

in an Orwellian regime of some kind). In this case, Pritchard suggests, one can acquire genuine understanding from the book even while genuine knowledge is ruled out.

Despite their differences, one point on which Kvanvig and Pritchard therefore agree is that understanding is not a species of knowledge, because while luck is not compatible with knowledge, it *is* compatible with understanding—either because, as Kvanvig has it, understanding is compatible with both Gettier-style and environmental luck, or because, as Pritchard claims, understanding is at least compatible with environmental luck. Put in terms of an objective normative condition: if Pritchard is right, then there needs to be at least a non-deviant connection between the grasping and the thing grasped; if Kvanvig is right, the connection can be as deviant as one might like.

It is not entirely clear, however, that the cases proposed by Kvanvig and Pritchard really establish that understanding is not a species of knowledge.³² For one thing, the claim that luck is not compatible with knowledge can be overstated. As Alvin Goldman (1999) and John Hawthorne (2004) have emphasized, in a “weak” sense of knowledge, all it takes to qualify as a knower with respect to some question is to believe the correct answer to the question; how the correct answer was arrived at seems irrelevant. Perhaps similarly, then, to qualify for a “weak” sense of understanding, all one needs to do is to be able to answer “why questions” successfully, where one might have come by this ability in a lucky way. In any case, it is unclear why, as Kvanvig seems to think, someone who can answer a broad range of “why questions” about a subject would count as understanding that subject while someone who is able to answer a similar range of questions would not qualify as a knower.

For another thing, the sort of *know-how* that we emphasized in Section 2— wherein someone “grasps” or “sees” how the various parts of a system depend upon one another— might also be thought to be compatible with luck, a point which would further undercut the

³² See, for example, Grimm (2006) and Brogaard (2008) for extended criticism.

assumption that knowledge as a genus is inimical to luck. After all, and to adopt one of Kvanvig's points, what we seem to "focus on," when we evaluate whether someone has know-how, is whether the person in fact has the ability in question, not how he or she came by the ability. Thus I might be happy to grant, for example, that Paul knows how to fix my computer, even if I later come to learn that he came by this knowledge in a lucky way. But then if, when we think about understanding, we similarly focus not on the aetiology of the ability but rather on the ability itself (the "grasping" or "seeing"), then this would not show that understanding is not a species of knowledge. Instead, it would only show that understanding is like know-how: that is, that it is a kind (or species) of knowledge where the focus is on the ability at issue rather than on the circumstances that gave rise to that ability.

4. Further Areas

We can close by pointing to a few areas that are prime for further research. The first has to do with the fact that understanding (and according to some, unlike knowledge) can come in degrees. Thus you and I might seem to understand the same thing, but your understanding might nonetheless seem to be much "deeper" or more profound than mine. But what is it that accounts for this difference? For example, is your understanding deeper than mine because you can see the thing as an instance of a larger law-like pattern—where the more encompassing the pattern, the deeper the understanding? Or is depth to be explained in some other way altogether?

A second project would be to investigate the ways in which the various forms of understanding mentioned at the outset—not just our understanding of the natural world, but also of meanings, motives, and rules—relate to one another. Given that we appeal to an idea of "seeing" or "grasping" in all of these areas, for example, there seems to be grounds for thinking that they share certain basic characteristics, if only at the level of psychology.

What's more, when it comes to our understanding of concepts or meanings, there seems to be a lively parallel debate emerging about whether this sort of conceptual understanding is or is not a species of knowledge.³³ It is natural to think that results in one of these areas will help to shed light on debates in the others, but it does not appear that serious work has yet been done to try to link these areas together.³⁴

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³³ See, for example, Longworth (2008).

³⁴ Thanks to Daniel Breyer, Adam Carter, Catherine Elgin, Daniel Fogal, Bryan Frances, Georgi Gardner, Emma Gordon, Allan Hazlett, Guy Longworth, Daniel McKaughn, Mark Newman, Duncan Pritchard, Todd Stewart, and Linda Zagzebski for very helpful feedback on earlier drafts of this paper.

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