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Understanding and Coming to Understand

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Abstract: Many philosophers take understanding to be a distinctive kind of knowledge that involves grasping dependency relations; moreover, they hold it to be particularly valuable. This paper aims to investigate and address two well-known puzzles that arise from this conception: (1) the nature of understanding itself—in particular, the nature of “grasping”; (2) the source of understanding’s distinctive value. In what follows, I’ll argue that we can shed light on both puzzles by recognizing first, the importance of the distinction between the act of coming to understand and the state of understanding; and second, that coming to understand is a creative act.

I.

Suppose I ask you how to get to Larissa, and you give me the right answer. Suppose further your answer is not a guess; you have some grounds for it. There are lots of different ways that could happen. For example, you might:

- Look it up on your phone.
- Remember how you got there last year.

- Do both of these things but also explain why certain routes that look good on the map are actually impossible or difficult because of the geography and road conditions.

As I see it, all three of these actions might result in conditions that could ground your knowledge of how to get to Larissa. Such conditions represent three different ways our opinions can be grounded, by being based on:

- Reliable sources.
- Experience or reasons that we possess.
- A grasp of the causal relations between local conditions and the feasibility of local travel routes.

If, like me, you are tolerant of a sensible pluralism about knowledge, you'll be comfortable saying that these different kinds of grounding give rise to different kinds of knowing.¹ The first sort of knowing is the sort we engage in when we absorb information from expert textbooks or good Internet resources. The second is the sort of knowing that occurs whenever possessing reasons or experience matters. And the third is different still—it is the sort of knowing we expect from experts—even if those experts are more intuitive than discursive in their abilities. This is what I'll call understanding. Understanding in this sense is what we have when we know not only the "what" but the "how" or the "why."² Understanding is what the scientist is after when trying to find out the root causes of Ebola outbreaks (not just predict how the disease spreads).

¹ Ernest Sosa is the leading pluralist about knowledge in this sense. See Sosa, E. (2010). Knowing Full Well, Princeton University Press.

² Kvanvig, J. (2003). The Value of Knowledge and the Pursuit of Understanding. Cambridge, UK, Cambridge University Press, Grimm, S. (2006). "Is Understanding a Species of Knowledge?" British Journal for the Philosophy of Science 57: 515-535.

It is what you are after when you want to know *why* your friend is so often depressed (as opposed to knowing that she is).³

Many philosophers take understanding to be a distinctive kind of knowledge that is particularly valuable. The kind of knowledge in question concerns grasping dependency relations. This paper aims to investigate and address two well-known puzzles that arise from this conception. The first concerns the nature of understanding itself—in particular, the nature of the “grasping” relationship that understanding is thought to involve. The second concerns the source of understanding’s distinctive value. In what follows, I’ll argue that we can shed light on both puzzles by recognizing first, the importance of the distinction between the act of coming to understand and the state of understanding; and second, that coming to understand is a creative act.

II.

“Understanding”, like “perceiving”, displays a typical state/act ambiguity. Taken in the first sense, it refers to a particular kind of epistemically valuable intentional cognitive state.⁴ While the details differ, most views of understanding agree on certain common features they take the state to have. These commonly cited properties of understanding can be used to help fix the reference of the “state” use of the term, and help us get clear on what we are talking about.

³ Philosophical accounts of the state of understanding often differ over whether to take understanding as a form of knowledge or not. This is an important difference, although how important may depend on one’s account of knowledge; pluralist accounts, like the one I favor, are willing to take “knowledge” as multiply realizable. While I will continue to take understanding as a form of knowledge in what follows, the substantive contributions of this paper are consistent with the hold that the concepts are more distinct. For discussion, see Zagzebski, L. (2001). *Recovering Understanding*. Knowledge, Truth and Duty: Essays on Epistemic Justification, Responsibility and Virtue. M. Steup. Oxford, Oxford University Press, Kvanvig, J. (2003). The Value of Knowledge and the Pursuit of Understanding. Cambridge, UK, Cambridge University Press, Grimm, S. (2006). "Is Understanding a Species of Knowledge?" British Journal for the Philosophy of Science 57: 515-535.

⁴ The state I go on to describe is degree-theoretic. One can understand more or less.

First, the state obviously is meant to be capable of having positive epistemic status — moreover, it can convey such status on other states. The state of understanding has probative force.

Second, it is directed at *how* or *why* something is the case. Thus, you understand more about the civil rights movement if you understand why and how it came about; you understand string theory if you understand why it predicts certain events; you understand a person to the extent you don't just know that she is unhappy, but what makes her unhappy.

We can take it that what is common between understanding *how* and understanding *why* is that we know something about the *structure* of the whole.⁵ This sounds grand, and it can be, as when we understand how a proof works or why a great historical event occurred. But it can also happen on a smaller scale. Consider, for example, the lucky person who understands how her car works. She has this understanding in part, as we'll discuss more fully in a moment, because she has certain skills, skills that give her the ability to see how various parts of a machine depend on one another: you can't get the car to move without the battery and the battery won't be charged without the alternator. You understand when you see not just the isolated bits, but how those bits hang together. Similarly with understanding why something is the case. When we understand why something is the case, such as why a certain disease spreads or why your friend is unhappy, or why a given apple tree produces good apples, we do so because we *grasp* various relationships. These relationships are what allow us to see the difference between possibilities, between one hypothesis and another.

If so, we might say that a third common thought about understanding is that understanding why or how is the result of *grasping* actual *dependency* relations, not just correlations. An instructive example is Plato's Euthyphronic contrast:

x is holy when, and only when, *x* is loved by the gods.

⁵ See Grimm, S. (2006). "Is Understanding a Species of Knowledge?" British Journal for the Philosophy of Science 57: 515-535, Grimm, S. R. (2011). Understanding. The Routledge Companion to Epistemology. D. P. S. Berneker, Routledge.

Instances of this schema will be universally true. They might be true in all possible worlds. But simply grasping the instances doesn't add up to understanding why what is holy is loved the gods, or how holiness and the will of the gods are metaphysically situated in terms of one another. Therefore, it doesn't add up to understanding the nature of holiness. To truly understand, you also need to know what *depends* on what.

The dependency relations we grasp when we understand can come in different forms. Some relations might be about cause and effect. Think of a game of chess: if I move my bishop to a certain square, I cause it to change its position. But they might also be logical: if I move my bishop to this square, it will be vulnerable to your pawn. Or semantic: the bishop can move to that square because the rules define it as being able to move diagonally across the board. In other words, the first important element of understanding a game like chess is grasping dependency relations: having systematic knowledge of how things both fit together and depend on one another, causally, logically and otherwise.⁶ Of course, knowledge of certain kinds of dependency relations might be particularly relevant to certain kinds of understanding. It seems plausible that scientific understanding, for example, gives pride of place to knowledge of causal relations.

Understanding, seen as stemming from the grasp of dependency relations, is consistent with, if it does not entail, holding that understanding can be directed at both theories and persons. Understanding a theory, on this view, would involve understanding the dependency relationships between the principles and theorems that constitute the theory. Likewise, understanding a person would amount to understanding the relationship between their cognitive and emotional

⁶ This is a broadly Aristotelian account of understanding. See Greco, J. (2014). Episteme: Knowledge and Understanding. *Virtues and Their Vices*. K. Timpe and C. Boyd. Oxford, Oxford University Press: 285-302. See also Grimm, S. (2006). "Is Understanding a Species of Knowledge?" *British Journal for the Philosophy of Science* 57: 515-535. (Not everyone sees understanding as involving knowledge. See Zagzebski, L. (2001). *Recovering Understanding. Knowledge, Truth and Duty: Essays on Epistemic Justification, Responsibility and Virtue*. M. Steup. Oxford, Oxford University Press.)

states and their behavior in certain contexts. In this sense, understanding a person amounts to grasping what “makes them tick” as we say.⁷

The state of understanding is also seen as being related, directly or indirectly, to other cognitive states and an agent’s behavior. Thus the idea that understanding is the grasping of dependency relations supports the idea that understanding, as numerous commentators have noted, is tied to explanation. On some views, understanding of certain kinds involves having the grasp of a *correct* explanation, or at least having the potential for such a grasp.⁸ But even if one does not take the (potential) to supply a correct explanation as a necessary condition for being in the state of understanding, it is plausible, at the very least, that understanding is conducive of good explanations.⁹

A related point is that the agent who understands thereby has certain abilities. The Oracle of Delphi supposedly announced that no one was wiser than Socrates. He famously replied that he only knew that he knew very little, or what he didn't know. So what sort of knowledge did he have? Well, consider what he was truly good at. One thing, surely, was asking questions. This came from a combination of knowing facts and the ability to draw connections between them. As a result he had *know-which*, as it were. He knew *which* questions to ask.

This is suggestive. The person who understands is, to some degree, discerning not only the actual situation, but also why various hypotheses

⁷ One complicating factor is whether, as Stephen Grimm has noted, one needs to also take a person’s beliefs and desires to be intelligible in order to understand her. Here, I think it is relevant to remember that understanding is a matter of degree. I understand you to some degree if I understand why you do what you do. I understand you more if I understand why you do what you do and find your beliefs and desires intelligible. See Grimm, S. (2016). "How Understanding People Differs from Understanding the Natural World." Philosophical Issues Forthcoming.

⁸ See Strevens, M. (2013). "No understanding without explanation." Studies in History and Philosophy of Science Part A 44(3): 510-515.

⁹ Thus understanding need not be factive, although the deeper it becomes, the more it will approach factivity. To understand perfectly, perhaps, *is* factive (For further discussion see Elgin, C. (2009). *Is Understanding Factive?* Epistemic Value. A. Haddock, A. Millar and D. Pritchard. Oxford, Oxford University Press: 322-330. See also Zagzebski, L. (2001). *Recovering Understanding*. Knowledge, Truth and Duty: Essays on Epistemic Justification, Responsibility and Virtue. M. Steup. Oxford, Oxford University Press.

and explanations *won't* work as well as how to ask what would.¹⁰ They know that kicking the refrigerator *here* and not *there* will help get it working. This is something that experts in general can do. Indeed, experts—those who understand a given subject best—are often able to increase their understanding even further because they have the ability to know which question they should ask in the face of new information. By so doing, they can, for example, reveal that Euthyphro knows nothing of piety.

Arguably, however, the skill of being able to ask good questions itself hinges, at least in part, on a simpler (and less overtly verbally orientated) cognitive capacity: the ability to make inferences and draw out a position's consequences—and not just the actual consequences of, say, a given position on what causes apples to be tasty, but also the consequences of that position in certain counterfactual situations. This is precisely the skill that a good doctor employs when considering whether to administer a drug, or a lawyer uses when considering an argument. It is also, arguably, the skill a good mechanic employs when considering whether to disassemble a head gasket, or an apple farmer uses when deciding whether another farmer's advice is reasonable. And those who have the capacity to cognitively engage, should they have the requisite verbal and linguistic abilities, will know which questions they should ask in order to carry their inquiries even further.

This list of commonly cited characteristics of understanding is hardly exhaustive. But it can be used to give a partial functional characterization of the state of understanding. Even a partial functionalist characterization can be used to fix the reference of the term. One suggestion might be this:

U: A state of some agent plays the understanding-role with regard to some subject when its content concerns dependency relations between propositions or states of affairs relevant to the subject; it is conducive of the agent's ability to offer justified explanations of the relevant

¹⁰ Again, see Strevens, M. (2013). "No understanding without explanation." Studies in History and Philosophy of Science Part A 44(3): 510-515.

subject;¹¹ and it disposes the agent to make further justified inferences both factual and counterfactual about the subject.

Such a state would presumably have positive epistemic status and probative force.

Like any functional description, this one still leaves much to be said. In particular, it leaves open the underlying psychological nature of the state or states that can play the role, and the value those states may or may not have when playing that role. Moreover, as we shall see, there is more to be said about the etiology of understanding—the distinctive causal antecedents of states playing the understanding-role.

III.

So what is the state that plays the u-role? A natural suggestion, given what we've said so far, might be a distinctive cognitive attitude we've called "grasping". While I think this suggestion is intuitive, and has something to be said for it, I don't think it is productive, for two reasons.

First, and as Stephen Grimm has noted, the psychology of such relations is difficult to parse—especially when we take it as constitutive of a stable state.¹²

One reason for that is that the root metaphor at work in "grasping" is obviously active. Grasping is something we do, and insofar as we think of it as having a distinct phenomenological character, it is a cognitive act, available to conscious attention. In contrast, understanding, taken as a state of mind, seems (like belief) dispositional. Just as one might be in a state of decision (or indecision, as the case may be) without doing anything in particular, or even being conscious of being in that state, we

¹¹ This clause is intended to be neutral with regard whether the agent has such an ability in the first place. If they do have such ability, the state playing the understanding-role will be conducive of that agent manifesting it. Children, for example, might lack that ability in certain contexts while still possessing some understanding. Thanks for Stephen Grimm for discussion.

¹² Grimm, S. R. (2011). Understanding. *The Routledge Companion to Epistemology*. D. P. S. Berneker, Routledge.

can understand why something is the case without being consciously aware of that fact, and without the understanding being available for conscious attention. Your understanding in such a case is tacit or implicit. Arguably, much of what we understand we understand in this way, and we can forget that we understand something that we do understand.

As noted above, understanding is also thought to have distinctive value. A second problem with the suggestion that grasping is what plays the u-role, is that it doesn't particularly help answer this question.

One might think at first that the reverse is the case. The thought would be that understanding is valuable because grasping dependency relations is valuable. That seems true, but it doesn't say what is *distinctively* valuable about understanding. If cognitive contact with dependency relations is valuable, then it seems possible that we might have epistemically positive cognitive contact with such relations in other ways. That is, we might know about the relations without understanding them. If so, what constitutes the *distinctive* value of the grasping of those relations? One tactic is to argue that the value of grasping rests in the fact that understanding is "active" and not passive: as a result understanding, unlike other epistemic states, is a cognitive achievement.¹³ That is plausible. But it raises some questions all on its own.¹⁴ First, we might wonder what type of achievement understanding is. Second, if being in the state of understanding is an achievement, then being in that state must itself be the result of an act—the act of *achieving* understanding. And generally, when we talk about achievements, we think that part of what makes the achievement admirable is that the agent voluntarily did something to achieve the goal. Achievements are partly valuable because, well, they were...*achieved*.

In sum, I think that it is implausible that grasping is what plays the u-role. On the one hand, it seems to overcomplicate matters: it posits an

¹³ See Pritchard, D. (2008). "Knowing the Answer, Understanding and Epistemic Value." *Grazer Philosophische Studien* 77: 325-339.

¹⁴ Similar problems arise with the possibility that understanding is valuable because knowledge is valuable, and understanding either is a type of knowledge or leads to knowledge. That just seems less than illuminating, since it doesn't actually tell us what is distinctively valuable about understanding itself and/or makes that value instrumental to another.

active process to play the role of what is plausibly a dispositional or implicit state. Second, it under-explains: it doesn't by itself, at least, explain why understanding is held to have distinctive value over and above other kinds of knowledge.

That said, I think it clear that grasping should figure in any account of what understanding is. The question is where.

I suggest we can make a promising start on this project by paying attention to the other half of the "understanding" state/act ambiguity. More precisely, I think it is worth thinking about the process of *coming to understand*. This should shed light on understanding (the state) itself. That's because like other kinds of mental states, the state's etiology, or typical causal antecedents, help to pick out its functional role. Think of the state of believing that certain things are in your visual field. Being in that state is the causal result of having visual experience. Likewise, to understand one must first come to understand. My hypothesis is that an analyses of the cognitive act of coming to understand can help shed light on why we are tempted to say that understanding (the state) is a cognitive achievement, and why it involves an activity like grasping.

In the view we'll entertain here, grasping is constitutive not so much of the state of understanding, *but of the causally prior act of coming to understand; moreover, this prior act is partly definitive of the state it produces.*

If this is right, then the state of understanding is distinctive in part because of its etiology; one comes to be in that state only in virtue of having been caused to do so by first engaging in an active psychological process which is available to conscious attention.¹⁵ But what is it to come to understand?

Coming to understand is a mental act in the same way that reflecting or deciding are mental acts. They are activities that your mind engages in. They take effort and increase the total cognitive load. A full description of the act of grasping is of course the job of empirical psychology and cognitive science; but prior theoretical reflection sharpens, here as elsewhere, our empirical inquiries. The sharpening I suggest is this:

¹⁵ Something can be available to conscious attention without, at that moment, being attended to.

coming to understand, and therefore the grasping that helps to constitute it, is a creative act.

In order to begin to see why this is plausible, and how it sheds light on understanding itself and its value, consider a (probably apocryphal) story about Descartes. Descartes was a late riser. His habit, when possible, was to stay in bed till around noon—musing. One day, according to legend, he was watching a fly zoom around above his head when, suddenly, he realized that he could track its position by measuring its distance from the walls and the ceiling. He understood how to plot its flight path in space . . . and voilà! We get Cartesian coordinates, or so the story goes.

The story of Descartes' fly—and others like it, such as those about Newton's apple or Einstein's clock—are instructive because they emphasize that the moment of coming to understand can involve sudden insight. Such moments are often called "aha moments" and, in the psychological literature, are collectively taken to signify the "Eureka effect" (so named after Archimedes, who after a moment of great insight shouted "Eureka!"). Of course, most acts of understanding do not require the sudden novel inspiration that Descartes had. But all of them do involve some level of insight. Having such an insight is part of why understanding is fundamentally a creative act.

Creativity, or creative acts, are complex. They are marked by having a combination of characteristics, characteristics that other acts can have but which taken together help to distinguish creative acts from other things humans do. One subset of creative acts—a particularly important subset—are creative mental or psychological acts. It is their characteristics I discuss here.

First, creative mental acts are new or novel. As Margaret Boden as famously emphasized, creative ideas needn't be *historically* novel—like Descartes' new geometrical ideas—but they are *psychologically* novel or novel to the creator.¹⁶ Thus, being creative isn't the same as being original. People can have ideas that are creative *for them*. As Boden says, "Suppose a twelve-year-old girl, who'd never read *Macbeth*, compared the healing

¹⁶ See Boden, M. A. (2004). The Creative Mind: Myths and Mechanisms, Routledge.

power of sleep with someone knitting up a raveled sleeve. Would you refuse to say she was creative, just because the Bard said it first?"¹⁷ I don't think so, and neither does Boden. Creativity is relative to a person.

Second, creative mental acts are generative of valuable, not just psychologically novel ideas. Creative ideas are valuable to the person's cognitive workspace. They move things forward on the conceptual field on which they are currently playing. They are useful and fecund. They have progeny, and they contribute to the problems at hand.

Third, creative mental acts are typically the result of the cognitive effort distinctive of synthetic imagination. The psychological act involved in composing a song requires the ability to put together a complex string of different ideas about harmony, melody and rhythm; the process of creating a coherent and believable fictional character likewise involves psychologically combining ideas of personality and physical description. This is we think that creative mental acts often put things together in new ways.

So far, coming to understand seems to fit this model of creative psychological acts: it involves generating in a synthetically imaginative way new and valuable ideas. Which ideas? Those that concern dependency relationships—how things fit together. The "grasping" of those relationships, which lies at the heart of understanding, is what makes understanding creative. This is most obvious in paradigmatic, historic cases of new understanding, like Descartes' insight into how point location in Euclidean space can be plotted algebraically or Einstein's flash of understanding relativity upon seeing a clock. But what about less historically original acts of understanding? Consider again a child who comes to understand, for the first time, why 0.150 is smaller than 0.5. At that moment, the child is also having an insight—a realization of how things are related. Or consider again our student above, coming to understand for the first time why Lady Macbeth sees blood on her hands, or why sailing is more pleasant and efficient when the wind is not behind you. Each of these acts of coming to understand are creative insights for the person in question, even though they are in no way novel.

¹⁷ Ibid., at 2.

The three characteristics of creative mental acts we've canvassed so far are not exhaustive; there is a fourth—one emphasized by Boden and more recently by Nanay.¹⁸ Creative mental acts have a distinctive phenomenological feel. The phenomenology in question might be described as something akin to surprise. Boden calls this their “impossible” aspect—that is, an idea is creative for a person when she has a felt sense that the idea could not have been had prior to the moment of creation. Conditions were right, and the person suddenly “sees.”

It seems clear that the act of grasping/coming to understand shares this characteristic as well. Indeed, it is particularly striking in this case. Coming to understand has a particular phenomenological appearance. In cases of sudden insight, this phenomenological aspect of creativity either constitutes, or leads to, the “eureka” feeling. But creative acts can be surprising even if they do not necessarily provoke that “aha” moment. Consider coming to slowly understand, for example, why a particular theorem followed from a particular set of premises—you understood, as we say, the proof. Even when coming to understand happens gradually over time it still feels “new” – as if you couldn't have understood it prior to that moment. It feels as if you've made forward progress. That's why it makes sense to say that the act of coming to understand is also surprising—again, not necessarily in the “eureka” sense—because the person who comes to understand feels as if they could not, relative to their past evidence and cognitive context, have understood it before that moment.

It might be thought that not all acts of coming to understand can be creative in this sense. Surely, one might think, coming to understand the simple logical entailments of what else I understand cannot be a creative. In many cases, those entailments, and seeing why they follow, is too trivial to count as truly creative.

In some cases, coming to know what follows from a proposition you understand, and why it follows, is not at all trivial. It requires great effort and insight. In those cases you do come to understand the

¹⁸ Nanay, B. (2014). An experiential account of creativity. The Philosophy of Creativity. E. Paul and S. B. Kaufman, Oxford University Press.

entailment. But in other cases such knowledge may well be trivial, and nothing in the account rules that out. That's because coming to know a given entailment may not be an act of *coming to understand*. Understanding is a matter of degree, and our account of the state implies that the greater one understands, the more one is able to draw the relevant inferences. Part of drawing the relevant inferences is knowing why certain entailments hold from what you do understand. Thus, if one understands $\langle p \rangle$ to a sufficient degree one will, *just by virtue of being in that state*, know why certain entailments hold. That's consistent with saying that while coming to understand $\langle p \rangle$ might be creative, one doesn't *separately* come to understand (in the target sense) $\langle q \rangle$. That's because if one understands $\langle p \rangle$ sufficiently, one is by virtue of that fact already disposed to know both $\langle \text{if } p \text{ then } q \rangle$ and $\langle q \rangle$.¹⁹

Some might protest that this account of creative mental acts is too permissive. According to this line of thought, originating a new proof is creative. You are the first person that comes up with it. But simply coming to understand why the proof works isn't creative.

This objection confuses ways something can be creative. A novel discovery or origination of a new proof is undoubtedly creative. Call this special type of creativity, which is very rare, o-creativity (for "original"). But as I pointed out above, not all creative acts are o-creative. (Consider, for example, the fact that someone might originate or discover a proof, the proof be forgotten for a thousand years, and then someone else might originate or discover it again). Thus your act of first originating a proof might be o-creative, but my act of coming to understand it for myself might be creative for me. And that's creativity enough.

Finally, it is worth emphasizing that the surprising or "impossible" aspect of creativity makes creating seem at once something we do (which it is) and at the same time something happening to us. The muse suddenly strikes. Realization comes in a flash. Coming to understand is like this as well. It involves insight, and insight, as the very word suggests, is like the voluntary opening of a door, a "disclosing," as Heidegger said. One acts

¹⁹ In addition, it bears noting that even if one understands $\langle p \rangle$, knows $\langle \text{if } p \text{ then } q \rangle$, and on that basis, comes to know $\langle q \rangle$. That fact alone doesn't mean you come to understand $\langle q \rangle$ since you may not understand $\langle \text{if } p \text{ then } q \rangle$.

by opening the door, and then one is acted upon by seeing what lies beyond.

IV.

We can summarize the hypotheses floated in the last section as follows: To understand requires first coming to understand. And coming to understand involves actively grasping certain dependency relations, where grasping is a conative state of mind (both directed and active) with features associated with a creative mental act. In particular, the act of coming to understand/grasping is creative for a person to the extent that it generates ideas that are, for that person:

- Novel
- Valuable
- The result of synthetic imagination
- Have a distinctive phenomenology: their “surprising” or “impossible” aspect.

Obviously, this description of the mental act of coming to understand/grasping doesn’t tell us everything about its nature. But it does help us see what is distinctive and special about the act of grasping, and as a result, can help to guide further investigation. When we “look for” grasping in our psychological theorizing and experimentation, the present suggestion is that we look for a mental act with these characteristics.

The above suggestion also allows us to adopt a more straightforward answer to the question of what occupies the u-role—that is, what kind of mental state is at play when we are in the state of understanding. The straightforward answer is that we are in a state of belief whose properties (both epistemic and psychological) allow it to play the understanding role. To understand is to believe in a certain way. But part of what it is to believe in that way is *to arrive at* the belief in a distinctive manner, to come to understand by grasping the relevant dependency relations. If so, then we can revise our functional analysis as follows:

U*: A belief (of some agent) plays the understanding-role with regard to some subject when the agent has been caused to be in that state by grasping dependency relations between propositions or states of affairs relevant to the subject; the ensuing belief is about those relations; having the belief is conducive of the agent's ability to offer justified explanations of the relevant subject; and it disposes the agent to make further justified inferences both factual and counterfactual about the subject.

The above analysis is consistent, of course, with some kind of psychological state other than belief playing the understanding role in some agents. But it seems likely that it is a kind of belief that most often realizes the role in human beings.

I began by suggesting that a focus on the act of coming to understand can light on two puzzles about understanding. The first puzzle was metaphysical, and concerned its nature. The above analyses provides an overall lesson. Like many other targets of psychological and epistemic analysis, understanding is distinguished by (1) how we come be in the state; (2) its properties and content; (3) its effects on our behavior and dispositions to behave. Nonetheless, understanding is still a deeply interesting and important state of mind, one that our analysis predicts as requiring cognitive effort to achieve, the result of the act of grasping how things hang together.

The second puzzle about understanding our suggestion may help to solve concerns its value. But before dealing with this question directly, it is illuminating to look at another longstanding issue about understanding: its relation to testimony.

Understanding is often said to be different from other forms of knowledge precisely because it is not *directly* conveyed by testimony—and thus not directly teachable.²⁰ The thought is that you can give someone the

²⁰ See Zagzebski, L. (1999). *What Is Knowledge?* The Blackwell Guide to Epistemology. J. Greco and E. Sosa, Oxford: Blackwell, Zagzebski, L. (2001). *Recovering Understanding. Knowledge, Truth and Duty: Essays on Epistemic Justification, Responsibility and Virtue*. M. Steup. Oxford, Oxford University Press.

basis for understanding via testimony, including the knowledge that they must have in order to achieve that understanding. But in the usual cases, you can't directly convey the understanding itself.

The question is *why* this should be. What is it about understanding that makes it difficult or impossible to convey via testimony? The present suggestion supplies an answer: in order to first understand, one must come to understand. And coming to understand is a creative act. As such, it requires a cognitive, generative psychological action on the part of the agent over and above whatever knowledge might be conveyed by another. An art teacher, for example, can give me the basis for creative thought by teaching me the rudiments of painting. She can give me ideas of what to paint and how to paint it. But I did not create these ideas; I create when I move beyond imitating to interpret these ideas in my own way. Likewise, you can give me a theorem without my understanding why it is true. And if I do come to understand why it is true, I do so because I've expended some effort—I've drawn the right logical connections. Coming to understand is something you must do for yourself.

Let's contrast this with other kinds of knowledge. I can download ordinary factual knowledge directly from you. You tell me that whales are mammals; I believe it, and if you are a reliable source and the proposition in question is true, I know in the receptive way. No effort needed. Or consider responsible belief: you give me some evidence for whales being mammals. You tell me that leading scientists believe it. If the evidence is good, then if I believe it, I'm doing so responsibly. But in neither case do I thereby directly understand why whales are or aren't mammals. You can, of course, give me the explanation (assuming you have it). But to understand it, I must first grasp it myself. Understanding can't be outsourced.

Earlier we noted that while it is intuitive that understanding has distinctive, perhaps intrinsic, value, it is unclear what the basis of that value happens to be. Our reflections on why understanding isn't conveyed by testimony rely on the fact that understanding is partly defined by its etiology; to be in the state, one must first come to

understand. This same fact helps to explain the distinctive value of understanding as well.

Earlier we noted that we typically take understanding to be a cognitive achievement, and that fact is part of the explanation for why we think it is valuable. But seeing understanding as an achievement, we noted, means that the state must be something we do out of an act of will. It has to be, as it were, achieved. The present account dovetails with, and explains, this fact. We achieve understanding because we first come to understand—an act that requires effort.

Moreover, coming to understand is a creative act. And the creativity of that act helps to explain our intuitive sense that understanding is a cognitive state of supreme value and importance, not just for where it gets us but in itself. Creativity matters to human beings. That's partly because the creative problem-solver is more apt to survive, or at least to get what she wants. But we also value it as an end. It is something we care about for its own sake. And that goes for coming to understand as well. It is an expression of one of the deepest parts of our humanity.²¹

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