

Understanding, problem-solving and conscious reflection

According to Zagzebski (2001), understanding something is justified by the exercise of cognitive skills and intellectual virtues the knower possesses. Zagzebski develops her view by suggesting that “understanding has internalist conditions for success” (2001, p.246).

Against this view, Grimm (2017) raises an objection: what justifies understanding is the reliability of the processes by which we come to understand, and we need not be aware of the outcome of all reliable processes. Understanding is no exception, so, given that understanding something results from reliable processes, we need not always be aware of what we understand.

I reply to Grimm's objection; I argue that Zagzebski's internalist requirement is best conceived as accessibility to conscious reflection. The accessibility condition is satisfied because understanding solves problems on the knower's research agenda. And whenever problem-solving is non-trivial (in most real-life cognitive situations), the knower needs to reflect on what the best solving strategy is.

1. Understanding and cognitive skills

One of the most important contemporary views about the nature of understanding is that advanced by Linda Zagzebski (2001). According to her, understanding something *consists* in the exercise of cognitive skills or intellectual virtues we possess. Zagzebski's view about understanding is part of her virtue epistemology. Not only does understanding consist in the exercise of cognitive skills (like easily building a logical proof) or virtues (like open-mindedness or intellectual humility, cf. Zagzebski 1996). Moreover, what we understand is *justified* because the accuracy of understanding is due to the aptness with which we exercise our skills and virtues (Sosa 2007). Just as a marksman hits the bull's-eye due to their expertise, so the pure mathematician can represent arithmetic in set theory

because she is familiar with both.

Like Moravcsik's (1979), Zagzebski aims her view to capture insights already present with Plato and Aristotle. Cognitive skills can be understood deferentially: whatever cognitive science says counts as a cognitive skill is one. Not so for Zagzebski, for whom the skills should satisfy the descriptions Plato and Aristotle offered for *technai* (2001). In particular, what makes knowledge virtuous is either that it contributes to the epistemic *flourishing* of the knower or that the knower comes to know what they do because they are *motivated* to seek that knowledge (1996). Either construal of virtues – and, by extension, of skills – requires a subjective component *internal* to the subject. This is what makes Zagzebski (2001, p.246) say that “understanding has internalist conditions for success”.

2. Reliability versus transparency

Zagzebski's view faces an important objection, coming from Stephen Grimm (2017). Grimm remarks, quite plausibly, that we don't ordinarily require of reliable processes¹ that they satisfy any additional internal criteria. Let's illustrate. Take the rule: when you justifiedly believe P and you justifiedly believe Q, you are justified in believing the conjunction P & Q. What is *required* for you to

1 To say that a method for forming beliefs is *reliable* is to say that most of the beliefs thus formed are true. The reliability of the method is given by the ratio of true beliefs formed divided by all beliefs formed by that method. This is a rough and ready formulation of what reliability is (compare Goldman 1986), but it will serve for the purposes of this paper. Whatever alternative conception of reliability one supplants (e.g., a counterfactual one, or a modal probabilistic one), nothing in the main dialectic of this paper needs to change. Mutatis mutandis for processes that help form an understanding of something.

be justified in believing P & Q is only that you justifiably believe both conjuncts – *not* that you have any special feeling of believing, *not* that you feel motivated towards anything, and *irrespective* of where your epistemic flourishing lies. And similarly for understanding something.²

Grimm phrases his objection as one against “transparency” (compare Zagzebski, who uses the very same term), where the transparency of understanding is the conscious experience that accompanies understanding, which the knower can introspect, thereby learning that they now understand something new. He writes:

What about the reliability condition? Here too I take it that it is hard to see how this could be transparent to reflection. Perhaps I can tell, on the basis of a given set of evidence or data and in light of my *a priori* knowledge of Bayes’s theorem, that certain variables are more likely to be causally relevant than others. But I can hardly tell by reflection alone that the data is representative or accurate and so on. In other words, perhaps what I can tell from the inside is that a particular causal inference might be conditionally reliable – reliable given the representativeness and accuracy of my data. But I cannot tell from the inside that my causal inference is actually reliable. And since the actual reliability of an inference seems to be needed for understanding, this important element too will be opaque to reflection. (Grimm 2017, pp. 218-219)

So taken, the objection comes to saying that, in order for a process of understanding something to be

2 This is not to say that additional requirements on what counts as understanding something couldn’t be imposed. It is important to know that they would be *additional* to, rather than constitutive of, what makes understanding justified.)

reliable, it *need not* (though it may) amount to a conscious experience having what is understood as content..³ While it makes sense to say novices consciously experience understanding, we have no reason for thinking that expert knowers in a given field still need to feel the thrill every time they understand something new, even when it was to be expected (Gopnik 1998).⁴

3. What is at stake in the debate?

By way of preliminary to replying to Grimm's objection, it seems useful to briefly chart the similarities and differences between Zagzebski and Grimm. Both of them think that what justifies understanding something is that it was acquired and sustained by cognitive processes that are reliable. Indeed, Zagzebski insists that intellectual virtues and cognitive skills need to be reliable to qualify as *technai* or virtues in the first place. Moreover, in what may be seen as a concession to Zagzebski's internalist stance, Grimm (2009) grants that the *sense* of understanding (the “Aha” experience, the feeling of assured familiarity and firm grasp of what one understands) is a *reliable* indicator of

3 Compare: many of our reasoning and memory routines are unconscious. And, even when we experience them, it is unclear whether our experience controls our cognitive performance, or whether it is a mere epiphenomenon of that performance.

4 Grimm's objection can clearly be generalized to marks of what makes understanding internal other than conscious reflective experiences, including whether one is motivated to understand what one does, whether understanding results in a better (more flourishing, more coherent, more helpful) epistemic life, whether what one understands is always accessible to reflection, and so on. For each of these marks that would make understanding internal, Grimm's challenge can be rehearsed: processes *can* lead to our understanding something, and *reliably* so, without exhibiting these marks.

understanding – whenever the feeling of understanding does occur (which may be only sometimes).

With these similarities in the background, the main differences between Grimm and Zagzebski's views are two. First, Zagzebski insists that the reliable processes by which one understands something need to be skills or intellectual virtues. Skills and virtues are often acquired and exercised in the background of a *social* practice which has its own standards of excellence with respect to which one's deeds may count as skilled or virtuous (MacIntyre 1984).⁵ Grimm does not impose any of these extra conditions. Second, Zagzebski, unlike Grimm, by claiming that “understanding has internalist conditions for success” makes the occurrence of what Grimm calls a “feeling of understanding” necessary if one is to understand anything at all. Whereas Grimm, while he grants the reliability of the sense of understanding (conditional, he claims, upon having *other* sufficient grounds for what one understands) whenever understanding *is* experienced, entirely grants that we may often understand things without consciously experiencing anything at all.

In what follows, it will become apparent that these two differences between Grimm and Zagzebski are related. It is precisely *because* Zagzebski thinks that understanding is justified by the exercise of cognitive skills (and intellectual virtues) whereas Grimm does not, that she ends by concluding that the criteria for understanding are internal (even though she agrees that the skills exercised are reliable *as well*). If Zagzebski's view is to deflect Grimm's objection, it then has to be the case that internalism about understanding somehow *follows* from the appeal to cognitive skills.⁶

5 Presumably, these are *not* processes that fulfill some *natural* function, nor are such processes developmentally hardwired.

6 Note that here we should distinguish internalism about *understanding* from internalism about *skills*. As Sosa (2007) argues, we may have an externalist conception of intellectual virtues (which, for him, include cognitive skills). But this does not automatically mean that Zagzebski is wrong about

4. “Internal to the subject” as accessibility to conscious reflection

To answer Grimm's objection to Zagzebski's view, we first need to zoom in on a sense of “internalism” in which criteria for understanding do, indeed, count as internal. We have already seen there are several options to choose from. Understanding may be internal in the sense that, whenever we understand something, we undergo a specific conscious experience – the “Aha” or “Eureka” experience (Bourget 2015). Or understanding may be internal in the sense that it relies on our grasp of concepts, thereby being relative to each knower's conceptual repertoire (Bealer 2000). Or understanding may be internal in the sense that it depends on the body of cognitive skills one uses (Sosa 2007). Or understanding may be internal in the sense that we can always reflect on what we understand.

The choice I prefer, and for which I will argue in what follows, is that understanding something is internal to the knower in the sense that, necessarily, the knower can consciously reflect on what she understands. This is also the choice that seems to most closely fit Zagzebski's intentions:

Understanding, in contrast, not only has internally accessible criteria, but it is a state that is constituted by a type of conscious transparency. It may be possible to know without knowing that one knows, but it is impossible to understand without understanding that

internalism about *understanding*. Sosa, who is an externalist about skills, has a partly internalist take on which kind of knowledge can constitute understanding, viz., *reflective* knowledge. My development of Zagzebski's view will closely follow this part of Sosa's view. Contrast, though, Sosa's externalism about cognitive skills with Annas' (2011) internalism about skills and Zagzebski's (1996) internalism about intellectual virtues.

one understands. To repeat, this does not eliminate every form of skepticism. Skepticism can appear at the second-order level. Nonetheless, there is less reason to doubt my understanding than there is to doubt other internally accessible states [.] (Zagzebski 2001, p. 246)

The dialectic of defending Zagzebski's view aside, I make this choice of an internal criterion of understanding – the necessary possibility of consciously reflecting upon what one understands – guided by three main reasons.⁷ First, it is often said (e.g., Elgin 2007) that understanding something can't be easily transmitted, and that the knower herself is *responsible for, and the author of*, what she understands. Reflection is similar to understanding in this respect. No one can instill reflection in you (though many may prompt you to engage in reflection on your own). Second, the fact that that reflection should specifically be conceived as *conscious* reflection does justice to recent work (Bourget 2015) that emphasizes how important conscious experiences of understanding are for our objectively checkable cognitive performance. Third, conscious reflection is also a good *epistemological* criterion for whether understanding is internal or not. As Sosa (2007) points out, understanding something is part of our reflective knowledge. The fact that our body of knowledge coheres, and that disparate facts are gathered in a unified perspective, is not an accident to which we are reflectively oblivious – it is in the nature of understanding that it lends itself to reflective scrutiny as a unity.

5. Understanding solves problems

⁷ These reasons support why this is a good criterion to measure internalism about understanding against. The reasons *don't* by themselves establish that internalism about understanding is true.

By the criterion of necessary accessibility to conscious reflection, is understanding something internal to the knower (no matter *what* is being understood)? I believe understanding is internal to the knower in this sense, and that it vindicates Zagzebski's view of understanding. My argument (in a nutshell, for reasons of space) has two parts. First, I sketch out how understanding involves *problem-solving*. Second, I point out that, in solving a problem that is even remotely interesting (as all real-life problems tend to be), knowers need to consciously reflect on what the best way to solve that problem is, and how effective the solution they provide is.

Reasoning from our problem-solving practices is straightforward. Understanding is justified by the exercise of cognitive skills. Cognitive skills are exercised when one solves a problem. So, understanding something is justified by appeal to how problems involving what we understand are solved. This argument establishes the conclusion that part of what justifies counting a particular cognitive endeavor as *understanding* rather than mere knowledge, is that it solves of problems.

The connection between understanding and solving problems is explicitly made by Zagzebski (2001, p.241). But it is also remarkably close to Grimm's view. For Ahlstrom-Vij and Grimm (2013), the cognitive achievement of knowledge is “getting it right”, and for Grimm (2006), “understanding is a species of knowledge”. Specifically, Grimm (2006) thinks we understand something when we can explain it, giving good answers to “What if things had been different?” questions. It follows that understanding something reliably solves a *particular type of problem*, namely, “What if it [what is understood] had been different in some respects?” So both Zagzebski and Grimm seem to subscribe to the claim that understanding solves problems. I am interested in the difference between the two, so will assume this claim in what follows, for the purpose of argument.⁸

⁸ For a cognitive-scientific review of how experiences of insight (or, equivalently here, of understanding) and problem-solving relate, cf. Bowden et al. (2005).

6. Any problem we solve, we *can* consciously reflect on

Problem-solving relates conscious reflection to how understanding is justified. One *can* always reflect about how to solve a problem – and that, in itself, is *enough* to ensure accessibility in principle to conscious reflection of what we understand.

Why is justification of what we understand internal to the knower? Here is my argument: The justification of understanding relies on the exercise of skills. Skills are exercised only in solving problems (hard or easy problems irrespective) – otherwise, why would we call them skills to begin with? Furthermore, it is constitutive of our problem-solving practices that we can always bring what we do to the fore of conscious reflection. And accessibility to conscious reflection is the criterion I have argued for above which, if satisfied, makes the justification of understanding internal. This argument holds in full generality. And it answers Grimm's challenge to give a *rationale* for why understanding is justified internally, rather than externally, to the knower.

Reflection does double duty. On the one hand, we reflect on whether we've correctly exercised our skills, running the gamut from checking for ordinary mistakes in calculation, to weighing the tenability of more general habits of idealization, simplification, and referring back to related problems. If we find errors, we correct for them and check again. On the other hand, we proceed in this self-correcting problem-solving enterprise *with an eye to what we understand* and how well we understand it. If a mistake is fruitful we follow it notwithstanding, to reap its results (Elgin 2007).

7. Conscious reflection is *needed* to solve hard problems

One might worry that “accessibility” is a slippery word: it stands for the *bare* possibility of

access, whereas *actually* reliable understanding would need to *actually* be accessed by conscious reflection if genuine internal justification is to be achieved, cognitively speaking. Here is a reply: If what one seeks is “skim” understanding, the bare-enough of understanding something, then the mere possibility of consciously reflecting on it should likewise be enough for one to internally count as justified in what one understands. The worry must then concern understanding *proper*, that seeks to go beyond that bare surface categorizing that may (to a minimal extent) count as understanding.

When the problem is difficult enough – as the vast majority of interesting problems are –, one *needs to* reflect on how to go about solving it best.⁹ Among narratives of scientific development, Kuhn (1962) stands out for both laying out the continuity between the scientific enterprise and everyday practices of puzzle-solving, and emphasizing how conscious reflection on the part of the main participants in a paradigm shift is prerequisite to succeeding at reshaping the foundations of a discipline.

Not only are hard problems, the problems that also procure us with vastly more understanding than any others, simply *more of the same* in point of what it takes to solve them, when compared to everyday puzzles. Oftentimes, solving a more difficult problem is not so much giving a cut and dry

9 We should do better to approach understanding not by seeking a unique common element to, say, understanding a painting and understanding how to count, but by focusing on those exemplary cognitive achievements that we take to illustrate understanding to the highest extent – the achievements of Aristotle, Newton, Darwin, Cantor, and the like. If we find an account of “genuine” understanding that does justice to these paradigm cases to a larger extent than competitors, that seems a more promising strategy than watering down what “understanding” means so as to cover cases as different as understanding how to prove Godel's incompleteness theorem and understanding how to ride a bike.

answer to a question as it is *clarifying* the terms in which the question is raised: *re-framing* the problem (Laudan 1977). It is this *conceptual* work that not only makes possible, but actually *requires* that one engage in conscious reflection on what the best ways of looking at the problem are.

8. Does problem-solving overly intellectualize understanding?

So far, I've argued that genuine understanding requires accessibility to conscious reflection because, as paradigmatic cases of understanding reveal, to understand involves solving problems, and the more realistic the problem is, the likelier it is that solving it should appeal to conscious reflective processes.

In this section I'll address an objection according to which to think that understanding always involves problem-solving overly intellectualizes understanding. You hit a window-pane with a stone, and it doesn't break. No questions asked, no problem raised – yet you understand that either the stone wasn't heavy enough, or the window glass must be especially resistant. You see a friend sullen after being slighted by a colleague. Again, no questions asked and no problem raised – yet you understand that the colleague must have hurt her feelings. Aren't these obvious cases of understanding?¹⁰ Yes and no, I will argue.

In the recent literature on understanding, it has been a commonplace that understanding is often – perhaps constitutively – tied to our being able *to explain* the phenomena we understand. Not everyone admits this, to be sure. But both Zagzebski and Grimm do. Recall Zagzebski (2001, p.240): “The person who has mastered a *techne* understands the nature of the product of the *techne* and is able

¹⁰ I am grateful to an anonymous reviewer for raising this question, and for providing insightful examples in its support.

to explain it.” One should, in other words, be able to give reasons for how one understands what one does, and which skills are best suited in performing that cognitive activity. For Grimm(2014), too, genuinely understanding a phenomenon amounts to knowledge of what the phenomenon understood *ontically depends on*, the causes or grounds of that phenomenon. And such knowledge, of course, affords an explanation of the phenomenon understood in terms of its causes or grounds.

To explain something, in turn, involves seeing something *puzzling* about the phenomenon explained, seeing it as a proper target of explanation. And to do so is to conceive of the whole explanatory situation as a problem to be solved, and finding a good enough explanation as a solution to the problem at hand.

Similarly, grant for a moment that understanding something involves the possibility of reflecting on it. We don't just reflect on anything at all. There has to be something eliciting our reflection – calling for us to use reflection in response to it. Typically, we reflect only when we encounter something *problematic*: when there is a puzzle to be solved, or when the epistemic situation could be *re-cast* in terms of a problem without doing injustice to it.

Mark Newman (2017) has argued persuasively, and at length, that theoretical understanding involves problem-solving. Notice, however, that he qualifies understanding as “theoretical.” This brings to light an element of *stipulation*. Other kinds of understanding (emotional, linguistic, perceptual, motor) are, perhaps, less theoretical, less intellectual, and not so easily cast as problem-solving. By imposing the requirement that we should be able to explain what we understand, giving reasons for why things occurred as they did, both Zagzebski and Grimm seem to be using “understanding” in a theoretical sense.

Let's bring the point back to the examples this section started with. You hit the window-pane with a stone, and yet it doesn't break. Suppose you now learn the glass is laminated, better resisting stones thrown at it. This is an explanation for what you yourself tried. And to explain something is to

find something there worth explaining. This is a problem, and your explanation – its solution. Even simple problems can be problems.

Perhaps we might think along similar lines about how you understand your friend's sullen face after her colleague insulted her. But here it seems more appropriate to admit the word “understanding” is used in several distinct ways. And we may have a direct insight – based on past experience, imagination, and empathy – into what a friend is feeling. We may have all this without having to be able to provide, on reflection, a conceptually articulated explanation of why or how we understand their hurt feelings, embarrassment or irritation. This usage of “understanding” differs from the one which ties it to explanation.

The two examples help because they point to the fact that conceiving understanding to be theoretical has consequences for which cases will count as cases of understanding. And, given the many ways the word “understanding” is used, this consequence seems inescapable.

9. Does appeal to reflection overly intellectualize understanding?

The objection that my defense of Zagzebski's view of understanding overly intellectualizes understanding can be put in another way too, targeting not problem-solving but the appeal to reflection. It is fair to wonder whether the requirement of reflective accessibility focuses too narrowly on striking episodes in the history of science, thought, and the arts – where reflection and solving problems do find a natural home –, and ignores the more mundane cases of understanding, where it is far from clear that our ability to reflect should be *required* in order to understand.

In this section, I address that worry. I do so by first addressing a related but distinct concern, pertaining to how a *virtue* epistemology of understanding like Zagzebski's connects with the appeal to the possibility of conscious *reflection*. This is a concern because, typically, we find intellectual virtues

useful precisely because they skirt around the need to always appeal to conscious reflection. We rely on our second nature, so to speak – on our epistemic character, its virtues included. How to reconcile a virtue-based conception of understanding with a reflective-accessibility conception of understanding?

In response to this second concern, I believe we *can* reconcile approaches to understanding based on intellectual virtues and, respectively, on reflective accessibility, by invoking the virtue of reflectiveness. Thus, the late Peter Goldie writes:

there is a normative requirement to be motivated to have, and to have, the right habits and dispositions of thought, such that doubts will arise when and only when they should. On particular occasions, much of our thinking will be unreflective, and not part of conscious deliberation, so we will need to rely on our habits and dispositions, at work in the background of our minds, so to speak. (Goldie 2004, pp.4-5)

Can we *always* bring to bear the resources of conscious reflection on a problem the solution of which we understand? The virtue of reflectiveness suggests otherwise. Properly exercising this virtue involves reflecting when – and *only* when – conscious reflection is needed in order to solve the problem at hand. To be sure, we often deviate from this epistemic ideal. But, to the extent that we largely possess a virtue of reflectiveness, the proper exercise of this virtue is one of our cognitive aims.

So construed, appeal to the virtue of reflectiveness answers the second worry. A virtue-based and, respectively, a reflection-based view of understanding are harmonized if what is required for understanding is that it should be *reflective* – that is, that one should be able to reflect in all *and only* those cases in which reflection is needed.

We are now also in a position to say why an appeal to reflectiveness also answers the first worry, that the demand of reflective accessibility overly intellectualizes understanding. To be sure, the

demand does put understanding squarely among our intellectual endeavors. But this is not an excessive requirement to impose on what understanding is. It isn't excessive because the possibility of reflection isn't *always* required. It is only required when the epistemic situation we are facing calls for it: when that situation can be framed as a problem to be solved, thereby calling for reflection to solve it.¹¹

10. Conclusion

We now have all the ingredients to provide a credible reply to Grimm's reliabilist challenge to Zagzebski's internalism about understanding. To recall, Zagzebski argued that understanding is justified by the exercise of cognitive skills. Modeling skills after what Plato and Aristotle thought of as *technai*, Zagzebski endorses internalism about what justifies understanding. Grimm objects to this, pointing out that it is enough for understanding to be justified if it is produced by reliable cognitive processes, no matter how internal or skilled.

I replied to Grimm on Zagzebski's behalf. Understanding is justified by the exercise of one's

¹¹ Acknowledging the role of reflectiveness in understanding answers another possible objection. We might wonder what the possibility of reflection amounts to. Surely it isn't a *bare possibility*, otherwise it would be easy to retort that any thought may pop into our minds as a fulguration our reflection would then have to take notice of. Admitting that understanding is reflective because it involves reflectiveness averts the objection. The conceptions we have of what we understand, and which constitute how we understand it, are accessible to our conscious reflection because – and to the extent that – we would be properly exercising our virtue of reflectiveness by bringing them to the fore of conscious reflection. We may, precisely by exercising the virtue of reflectiveness, not consciously reflect on a matter – because no reflection was, there and then, needed.

cognitive skills. Which skills are relevant to one's cognitive performance will depend on the problems on one's research agenda, and the strategies one chooses to solve them. Rarely is there a unique right strategy to solve a problem. Problem-solving is a matter of weighing and choosing what one takes to be the best way to move forward. The skills one brings to bear to the problem-solving process are skills that one deems, on reflection, to be pertinent to the solution of the problem at hand. And whether a solution has been attained is assessed, again, in reflection. It is these ineliminable relations between skills, problems to be solved, and guidance by reflection, that warrant Zagzebski in claiming that there is an internal criterion for justifying understanding: it is the validation, in conscious reflection, of the competent success achieved at solving a problem – a problem one will have adequately provided a solution for only after first framing it in reflection to begin with.

To the worry that this might overly intellectualize understanding, I have replied by pointing out the sense in which understanding – as conceived by both Zagzebski and Grimm – is theoretical, or is accompanied by the thinker's ability to explain the phenomena understood. To explain is to see what is understood in a way that is – or might easily be – cast as a problem, calling for conscious reflection to solve it. Good problem-solvers are reflective: they reflect all and only when needed. And their reflectiveness is one of the skills that underwrites their understanding. This averts the challenge of excessive intellectualism because reflection and problem-solving are seldom actually needed in order to understand – they need only be *possible*. Equally, however, appeal to reflectiveness, explanation, and casting one's epistemic situation as problem-solving do acknowledge that, without being overly intellectual, skill-based understanding is intellectual nonetheless.

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