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Reasoning with knowledge of things

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ABSTRACT

When we experience the world – see, hear, feel, taste, or smell things – we gain all sorts of knowledge about the things around us. And this knowledge figures heavily in our reasoning about the world – about what to think and do in response to it. But what is the nature of this knowledge? On one commonly held view, all knowledge is constituted by beliefs in propositions. But in this paper I argue against this view. I argue that some knowledge is constituted, not by beliefs in propositions, but by awareness of properties and objects. To make my case, I focus on the role of visual perception in reasoning. I start by introducing a principle about the relationship between knowledge and reasoning, which says that to learn something new by reasoning, one must know the bases of one's reasoning. Then I argue that in some cases of genuine, knowledge-conferring reasoning, the bases of our reasoning are not propositions that we believe; rather, they're properties or objects that we see. Thus, I conclude that some such knowledge is non-propositional and is rather what some call "knowledge of things".

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1. Introduction

I know of all sorts of things in my immediate environment. As I sit here in this quaint little coffee shop, I look around and thereby come to know of particular chairs and tables, people and papers; right *there* is a clock, *there* is a cup ... and coffee, and cake. I take in a swirl of colors, shapes, and spatial configurations and orientations. There's a lot going on. But I see all of these things and, indeed, I know of them.

This knowledge of my surroundings is as important as it is common. But what is its nature? What is it like? These days it's standard practice among philosophers to treat all knowledge (aside perhaps from "know-how") as *propositional* – as constituted by beliefs in propositions.¹ Not just *some* of it. Everyone can agree that I have some propositional knowledge in the above case – that I know that I'm in a coffee shop, or that it's half past one, for example. But what about my knowledge of the chairs strewn about the

room? Or the highly determinate, brownish color of my coffee? Or the very specific, rectangular shape of the table? The standard practice among philosophers is to treat it *all* (insofar as I have it) as propositional.

In this paper I'll argue that this is a mistake. Through appeal to cases of visual perception, I'll argue that some knowledge is constituted, not by beliefs in propositions, but by awareness of properties and objects. To make my case, I'll focus on the role of perception in *reasoning*. First I'll introduce a widely held principle about the relationship between knowledge and reasoning, which is that in reasoning new knowledge comes from old knowledge – that you can't learn something new by reasoning from what you don't know. Then I'll argue that in some cases of genuine, knowledge-conferring reasoning, the bases of our reasoning are not propositions that we believe; rather, they're properties or objects that we see. Thus, I'll conclude that some such knowledge is non-propositional. Finally, I'll put forward a preliminary account of this knowledge that is based on Russell's (1911, 1912) account of "knowledge of things."

2. Knowledge and reasoning

The first step in my argument is to introduce a certain principle about reasoning. I take reasoning to be a mental activity whereby one responds to information by making rationally assessable transitions to conclusions on the basis of that information.² And our principle about reasoning is stated (roughly) as follows: In reasoning, new knowledge comes from old knowledge. You can't learn something new by reasoning from what you don't know. So if you know some *x* by reasoning on the basis of *y* and *z*, then you know *y* and *z*.

This is borne out by examples. If I conclude that today's mail is here on the basis of my belief that there's a fresh stack of mail on my desk, then I know that today's mail is here only if I know that there is indeed a stack of mail on my desk and that it is in fact fresh. Or if I reason that it's going to rain today, but solely on the basis of premises that are unjustified (and thus unknown) – such as superstitious beliefs – then I don't know that it's going to rain today. In order to know these conclusions, I've got to know their premises.

There is a more general principle here. Here's one way to put it:

New-from-Old: If *S* competently reasons from *P* to *Q*, and thereby comes to know *Q* from *P*, then *S* knows *P* (at the time of the reasoning).³

It's worth emphasizing that in order for the antecedent of this principle to be satisfied, *S* must come to know *Q* *by reasoning from P*. This means that *P* must really be the *basis* of, or *reason* for, *S*'s inference to and knowledge of *Q*, in order for this principle to apply. New-from-Old states that, in all such cases, *S* knows *P*.

New-from-Old is a plausible and widely held principle. One of its main justifications is that reasoning only ever *transmits* knowledge, and you can't transmit what's not already there. Here's how Robert Audi puts it:

... [I]nference is not a basic source of justification or knowledge, but rather *transmits* and thereby *extends* them, in appropriate circumstances, from one or more premises to the conclusion inferred from them. We can extend our justification and knowledge by inference, but it appears that if we have none to start with, inference ... can give us none. Even amply justified inferences ... do not *create* justification or knowledge when, because we neither know nor have justification for our premise(s), there is none to start with. (Audi, 2010, p. 184)⁴

Another justification for New-from-Old concerns the epistemic status of conclusions relative to their premises (at least in the context of the reasoning). Here's how Frederico Luzzi puts it concerning deduction:

In single-premise deduction, the epistemic pedigree of the conclusion can be no better than the epistemic pedigree of the premise. So if the conclusion has the pedigree of knowledge, so must the premise. (Luzzi, 2014, p. 261)

Various philosophers echo these sentiments. Others give somewhat different rationales.⁵ Many simply assume that New-from-Old is true.⁶ As I've said, New-from-Old is both plausible and widely-held.

Nonetheless, some philosophers have suggested counterexamples to it. Here's one from Ted Warfield:

With hopes of getting him to attend a party in Providence on Saturday night, Jaegwon Kim asks Christopher Hill what he's doing on Saturday. Hill replies 'I'm flying to Fayetteville on Saturday night' and the conversation ends. Kim, recalling that Hill taught for many years in Fayetteville, Arkansas, reasons as follows: 'Hill will be in Arkansas on Saturday night; so, he won't be at my party Saturday night'. Kim knows his conclusion, but his premise is false: Hill is flying to Fayetteville, *North Carolina*. (Warfield, 2005, p. 407)

Here's another putative counterexample from Luzzi:

As they swiftly roll by on the wooden track I have assembled for them, I count a series of marbles. The procedure yields 53 as a result. With some confidence, I come to believe that there are 53 marbles on the wooden track. Recalling that my logic professor told me earlier that day that precision entails approximation, I competently deduce that there are approximately 53 marbles, without any loss of confidence in my belief that there are 53 marbles. But despite my best efforts in the difficulty of the task of counting the rapidly-rolling marbles, I double-counted one marble; there are actually only 52. (Luzzi, 2014, pp. 264–265)

These are two putative counterexamples to New-from-Old. There are a few others like them. They're all meant to show that, in some cases, you can learn something new by reasoning from what you don't know.

As interesting as they are, I'm going to set these counterexamples aside. This is for three reasons. The first is that I think they're unconvincing. It seems to me that, in each of the above cases, the subject's knowledge, insofar as he has it, is based, not on the relevant unknown premises, but rather, on some other background knowledge or implicitly known premises (e.g., 'Hill will be out of town on Saturday'). To be fair, defenders of these counterexamples have discussed this worry. But I for one remain unconvinced.

My second reason for discounting these counterexamples is that, even if a few such cases exist, we can all still agree that by-and-large – indeed, in the vast majority of cases – new knowledge via reasoning comes from old knowledge. So if S learns Q by reasoning from P, it's very likely that S knows P. In the next section I'll introduce an array of cases – diverse in subject and varied in type – where the bases of knowledge-conferring reasoning are not propositions one believes, but rather, properties or objects one sees. So the fact that New-from-Old is true in the vast majority of cases, plus the fact that my cases are diverse in kind, will give us strong reason to believe that some knowledge is non-propositional.

Furthermore – and this is my third reason for setting aside the counterexamples – the cases that I'll provide are very different from the putative counterexamples. This is true in several respects, but one especially salient respect in which they differ is that, unlike every proposed counterexample, my cases do not involve any *errors* or *missing information* or *false beliefs* on behalf of the subject. This and other details make my cases quite unlike the putative counterexamples. So, even if there are some counterexamples to New-from-Old, we will have ample reason to believe that my cases are good instances – *true* instances – of New-from-Old.

I will move forward with New-from-Old as stated above, because I believe it is true in every case. But I also invite those who do not accept New-from-Old *in full generality* to adjust the principle as they see fit – perhaps adding “in almost every case” or “except in a few odd cases where the subject is mistaken about something” – or to just assess my examples on a case-by-case basis. For we needn't let a few far-removed (and I think unconvincing) counterexamples distract us from the merits of the cases to follow.

3. Reasoning with things

In this section, I will argue that some bases of knowledge-conferring reasoning are non-propositional. So, given New-from-Old, I will conclude that some knowledge is non-propositional. In the next section, I will offer an account of this knowledge and argue that it is constituted, not by beliefs in propositions, but rather by awareness of objects and properties – it is knowledge, not of truths, but of *things*.

Let's start with some ground clearing. I say that some knowledge is non-propositional. I take propositional knowledge to be constituted by beliefs in propositions. So I deny that all knowledge is so constituted. I take beliefs to be propositional attitudes and thus to necessarily have propositions as contents. What propositions are is controversial. But I at least take them to be abstract bearers of truth and falsity that are expressed by declarative sentences (potentially in multiple ways) and embedded in 'that'-clauses in attitude ascriptions. As such, I take it that objects and properties are not, by themselves, propositions. And I take it that awareness of an object or a property is not, by itself, a belief in a proposition (either in part or whole).⁷

In the next section I will suggest that instances of non-propositional knowledge come from both perception and introspection. But in this section I will deal mostly with visual perception. Some philosophers say that perception has propositional content. This is consistent with my arguments. For suppose that perception has propositional content. Then what I am concerned with here are what some would consider the constituent parts of those contents – the objects and properties that we see.⁸ I claim that we reason with those constituents and that our awareness of them counts as knowledge. This is consistent with those constituents also being "parts" of propositional contents. It is also consistent with our sometimes reasoning with these propositional contents. Such reasoning is not my focus here. However, note that if some bases of reasoning are constituted by perceptual awareness of propositional contents, then that, together with New-from-Old, would also upend the orthodox assumption that all knowledge is constituted by *beliefs* in propositions (more on this later).

Finally, as I said earlier, I take reasoning to be a mental activity whereby one responds to information by making rationally assessable transitions to conclusions on the basis of that information. This is just a rough characterization. I will address concerns as they arise about whether this or that case involves genuine reasoning, but I will neither offer nor defend a specific view of what reasoning is.⁹ At the end of the day, I will trust that readers can determine whether the mental activities that I describe count as genuine reasoning – or, at least, deserve to be under the purview of New-from-Old given its aforementioned motivations.

Now back to my argument. Let's start with this question: How does perception figure in our reasoning? Everyone should agree it does *in some ways*. For example, it provides *inputs* to our reasoning. I see the look on the cashier's face and reason that he's irritated, or I see the spatial layout of the coffee shop and use that to reason about how to get to my table. Some philosophers go further and argue that perception provides, not just inputs to reasoning, but actual reasons – all by itself (cf., Pautz, 2017; Pryor, 2000). On their view, being perceptually aware of objects and properties is sufficient to give one reason to believe certain things about them. For example, if

I see three patches of color – one blue, one blue-green, and one red – I thereby have reason to believe that the blue-green patch is more similar in color to the blue patch than to the red patch. So, if this view is correct, then perception provides not only inputs to our reasoning but also reasons themselves.

However, this may not be enough for our purposes. For you might think that real reasoning – what turns old knowledge into new knowledge – has to be a deliberate process that extends beyond immediate judgments.

So now I'll argue that the objects and properties that we perceive feature in our reasoning, not only as reasons, but as the very items that we deliberate with and infer conclusions on the basis of. Elsewhere I've argued that this can be seen especially clearly in certain types of reasoning that philosophers sometimes overlook, such as association, instrumental reasoning, and problem solving (see, Duncan, 2020). Here I'll start by developing and refortifying those lines of argument. Then I'll extend my argument to cover other types of reasoning.

First, *association*. In the coffee shop, when the cashier responds to my questions about the menu with a certain manner and tone of voice characteristic of sarcasm, I may consciously attend to and think about his manner and tone, and associate these characteristics with sarcasm. And then, given the context, I may also consciously and deliberately associate that sarcasm with displeasure and thus conclude that the cashier is displeased with my question.¹⁰ Some of the background knowledge underlying these associations is propositional. But when I actually use association to (knowingly) infer that the cashier is displeased, *what I am associating* are not propositions – they're properties, some of which I perceive. I associate a highly specific tone of voice that I hear and a highly specific bodily manner that I see with sarcasm, and I associate that sarcasm with displeasure. These are properties that I hear and see, a type of expression (sarcasm), and a feeling or emotion (displeasure). Which are not propositions. Indeed, the constituents of associative reasoning are not always, or even typically, propositional. Sometimes they're things of which we are aware (more on this below).

So here's an argument for non-propositional knowledge: We sometimes gain new knowledge via associative reasoning. You can't learn by reasoning on the basis of what you don't know (New-from-Old). In this case in particular, it's clear that I know the bases of my reasoning. If I hadn't known what the cashier looked and sounded like, then I wouldn't have known that he was being sarcastic. So, in this case, as in others, I know the bases of knowledge-conferring associations. These bases are not always propositions – sometimes they're properties and/or objects that we see. Therefore, some knowledge is non-propositional.

A defender of the orthodox view of knowledge might reply that, insofar as what I'm doing in this case is reasoning from old knowledge to new knowledge, the old knowledge is propositional – it is constituted by beliefs such as *that* the cashier looks and sounds thus-and-so, *that* anyone who looks and sounds thus-and-so is being sarcastic, *that* sarcastic strangers tend to be displeased, etc.¹¹ But this is implausible. For one thing, it's doubtful that I have beliefs about which *specific* properties are sufficient for sarcasm – beliefs that I would have to have (as my old knowledge) in the above case for me to reason to new knowledge in line with the propositional orthodoxy. In this way, a propositional model of my reasoning is psychologically unrealistic.

This point is reinforced by the fact that associative reasoning is *context-sensitive*. In order for the above propositional model to explain human associative reasoning, it would have to posit beliefs about the sufficient conditions for sarcasm that encode, not just very fine-grained perceptual information about the way sarcastic people look and sound, but also very fine-grained information about how various contextual factors bear on whether someone is being sarcastic.¹² Again, it's doubtful that we have beliefs like that. Also, note that we can, and often do, form judgments like “so-and-so is being sarcastic” in *novel* contexts. So even if we did have some vast store of beliefs about the sufficient conditions for sarcasm, those beliefs would be idle – both in terms of explaining how we reason and in terms of understanding how the relevant inferences could be justified – in a variety of novel contexts in which we learn that so-and-so is being sarcastic.

In response, one might concede that I don't have *beliefs* like those above, but nonetheless maintain that what I'm *entertaining* and *associating* to get to the conclusion that the waiter is displeased are propositions. However, this response is small comfort to the orthodox, for, given New-from-Old, it implies that I have knowledge that is not constituted by beliefs. Since New-from-Old implies that I know the bases of my reasoning, it, together with the above response, implies that my merely being aware of, or entertaining, or associating, propositions – without actually believing them – counts as knowledge. Which, aside from being problematic in its own right, defies orthodoxy. So the defender of the above response would have to introduce and defend her own unorthodox account of non-doxastic (albeit propositional) knowledge.

Some may feel up for that task.¹³ But there is another problem with these propositional models of my reasoning, regardless of whether they involve belief. It's that they are implausible as accounts of associative reasoning. It's more-or-less uncontroversial among philosophers and psychologists who work on the subject that association differs in important ways from the various forms of propositional reasoning, including in that it sometimes has non-propositional bases (see, e.g., Camp, 2014;

Carruthers, 2006; Evans, 2008; Prinz, 2002; Sloman, 1996). The standard view is that sometimes we learn by associating *things* – objects or properties – not propositions. Thus, given New-from-Old, these things must sometimes be the known bases of reasoning. A defender of the propositional-only view of knowledge might wish to deny the standard view that we sometimes associate things, not propositions; but the burden is on them to make that case.

This is especially so given that my claim here is relatively weak. I'm only claiming that, with association, the objects and properties that we see are *sometimes* the known bases of reasoning. Not always. Or even often. Just *sometimes*. For that's all it takes, given New-from-Old, to support my conclusion that *some* knowledge is non-propositional. If standard views about association (as discussed in the above literature) are right, then the truth is that we engage in this kind of reasoning – with non-propositional bases – quite often. But, again, here I'm only claiming that we sometimes do. So, again, the burden is squarely on the objectors here – on those who would deny that we *ever* gain knowledge by associating non-propositional bases.

A different potential objection is that association is not a genuine form of reasoning – and so not relevant to New-from-Old – because associations are just brute, non-deliberative causal processes. However, while some of our associations fit this stereotype, not all do. Some associations – perhaps like the example mentioned above – are deliberative, controlled or willful (at least to some extent), rationally assessable in virtue of their fittingness to objective features in the world or aptness for achieving one's desired goals, and highly integrated with other forms of reasoning (see, Camp, 2014).¹⁴ So, while it sometimes escapes philosophers' attention, association is a genuine form of reasoning.¹⁵ And since perceptual objects and properties are sometimes its bases, New-from-Old thus implies that some perceptual knowledge is non-propositional.

Now consider a second form of reasoning – *instrumental reasoning*. Instrumental reasoning involves identifying a non-actual state of affairs that may not be desirable in itself but that will help one achieve some goal (Camp & Shupe, 2017). Suppose, for example, that my goal is to have a good time at the beach. In order to do that, I have to bring the right stuff. So I identify a non-actual state of affairs – my car filled with beach stuff – that is not desirable in itself but that will help me achieve my goal. But I need to know whether my stuff will fit. How do I figure this out? One way is via *simulation* (see, Camp & Shupe, 2017, p. 103; Millikan, 2006, p. 118; Prinz, 2002, Ch. 6). As I stand outside looking at the trunk of my car, I mentally simulate packing various items in my car in order to determine whether the trunk will fit everything. This simulation is based in part on my perceptual awareness of the trunk and in part on stored perceptual information that

helps me imagine the sizes and shapes of the chairs, towels, and other objects that I want to fit into the trunk. So the things I perceive are part of what I'm reasoning with in this case.

So here's another argument for non-propositional knowledge: My instrumental reasoning gives me knowledge about how to achieve my goal. And, as before, this knowledge requires prior knowledge – e.g., of the approximate shapes and sizes of the trunk, chairs, cooler, etc. If I don't know the rough size and shape of these things, then I won't know whether they'll fit. So, again, new knowledge comes from old knowledge. But now when I mentally simulate packing my car, I don't think *propositionally* about these things. I simply *see* or *imagine* them. Thus, this knowledge I have when simulating is non-propositional.

As before, one might try to propositionalize the above reasoning. But, as before, this is unlikely to succeed. First of all, it's doubtful that I have or entertain (innumerably many) beliefs corresponding to all of the extremely fine-grained perceptual information that figures in my simulation – beliefs that I would need to have to reason from old propositional knowledge to new knowledge about whether the stuff will fit – and it's doubtful that I retain and continue to entertain these beliefs throughout the reasoning process in a way that corresponds to my remembering where I mentally “put” things in my simulation. And even if these things weren't doubtful, still, the fact is, propositional reasoning is just not what I'm doing here. I'm simulating, not deducing – nor am I associating propositions or engaging in any other form of propositional reasoning.

Further support for this last point derives from the fact that simulation is, at least sometimes, a *conscious* process. Given this, I should be able to tell through introspection how I'm reasoning (at least sometimes). But when I introspect on the mental processes involved in my beach-packing simulation, it doesn't seem like I'm engaging in propositional reasoning. It seems like I'm simply seeing or imagining things, and drawing conclusions on that basis. This further supports my claim that in instrumental reasoning via simulation, awareness of properties or objects is sometimes a known basis of reasoning.

And, as before, this is a relatively weak claim. For my purposes, it only needs to be that we *sometimes* engage in this non-propositional reasoning. Not always, or even often – just *once* will do. To further support this relatively weak claim, consider this: Whether or not we often engage in the kind of reasoning that I described above, nothing obviously *precludes* us from doing so. We *could* do it. I, for example, could attend to the things I see lying there next to my car, perform a (rationally assessable) simulation based just on my awareness of shape and size properties, and come to know whether those shapes and sizes correspond in the relevant ways to the shape and size of my trunk. Not all of the key steps in this reasoning *need*

to involve propositions. I could get to my conclusion even if some of these steps were based solely on my awareness of properties. And if that's right, then surely *sometimes* I, or anyone else, succeed in doing so (after all, I tried!). Which is all it takes, given New-from-Old, to support my conclusion that *some* knowledge is non-propositional. Thus, even if one thinks that we don't usually reason this way, one should still accept that awareness of properties or objects is sometimes a known basis of instrumental reasoning.

Now consider a third form of reasoning: *problem solving*. In a famous series of experiments, Roger Shepard showed that some problem solving involves *mental rotation*. Shepard and Metzler (1971) gave subjects pairs of pictures of three-dimensional figures – composed of cubes in various arrangements – and asked subjects to report, as quickly as possible, whether the figures in these pictures were the same. In some cases, the figures were the same, but one was just rotated relative to the other; in other cases, they were different. As it turns out, when the figures were the same, the time it took subjects to report that they were the same was proportional to the degree to which one figure was rotated relative to the other. Shepard and Metzler (1971) concluded that subjects engaged in an internal, imagistic “mental rotation” of the figures in order to solve this problem.¹⁶ Which would seem to implicate non-propositional reasoning in mental rotation. Mental rotation is based in part on one's perceptual awareness of the figures in the pictures, and in part on one's mental rotations of those figures. Again, these bases of reasoning are non-propositional.

So here's yet another argument for non-propositional knowledge: Some subjects who mentally rotate figures *know* that the figures are the same. This requires knowledge of the figures both before and during mental rotation, otherwise subjects wouldn't be justified in concluding that the figures are the same. Subjects' reasoning in these cases is not propositional. It is reasoning with figures and images that one sees and imagines. So subjects' mental rotation knowledge, which yields knowledge about the figures, is not propositional.

As before, to deny this conclusion, one would have to deny that we *ever* – even sometimes – engage in the reasoning described above. Which is implausible. After all, just consider (as above): Does anything *preclude* us from reasoning in this way? Is it *impossible*? Or is it something we *could* do? Here's what I think I can do: I can see a shape, then mentally rotate that shape so that the shape I am imagining matches a second shape. Then I can conclude: “They're the same!” Does every step in this process – each basis of my reasoning – absolutely require thinking about the shapes propositionally? Is it *essential* to my reasoning? It doesn't seem so. And, if it's not, then it's plausible to think that, at least sometimes, we do it without propositions. And, if that's right, then, given New-from-Old, it follows that some knowledge is non-propositional.

So association, instrumental reasoning, and problem solving are three kinds of reasoning that perception of things features in. And the properties and objects that we perceive feature in these forms of reasoning, not just as inputs, but as the very things that we deliberate with and infer conclusions on the basis of. Thus, given New-from-Old, it follows that we have knowledge of the properties and objects that we perceive. These properties and objects are not propositions. They aren't true or false, expressible by declarative sentences, or marked out by that-clauses in attitude ascriptions. Thus, some knowledge is non-propositional.

Some may still not be satisfied. For some may want to reserve the term 'reasoning' for a very specific kind of thinking – logic, deduction, or the like. And some may also assume that this sort of thinking has to be propositional.

However, the claim (or assumption) that all logical reasoning is or must be propositional turns out to be seriously overblown, if not simply mistaken. This is illustrated by Sun-Joo Shin's work on diagrams and Elisabeth Camp's work on maps.¹⁷ Shin (1994) shows that Venn diagrams, for example, are governed by formal rules of inference that are sound and complete up to expressive equivalence with monadic first-order predicate logic (also see, Camp, 2007; Coliva, 2012). And Camp (2007) shows that some maps have many of the formal features of sentences and propositions that make them well suited to feature in logical reasoning. She says:

Such maps are clearly constructed out of recurrent formal elements that make a common semantic contribution each time they occur: for instance, on many maps any solid line of a certain width signifies a street, any blue line or blob signifies a river or lake, and any cross signifies a church. Further, the representational import of the entire map is a systematic function of the way in which those elements are combined: if two lines intersect, with a blob in one quadrant and a cross in the other ... then this represents two intersecting streets with a church across from a pond. By contrast, if the two lines are drawn in parallel, with the cross above the blob ... then these same elements represent a different but related situation, in which a church is north of a pond and between two parallel roads ... I see no theoretical reason why one couldn't define formal updating rules for dynamic reasoning with maps that would mirror semantic changes in the relations among the represented states of affairs, and thus would be reliably and demonstrably truth-preserving. And I believe that such rules could be used in genuine reasoning. (Camp, 2007, p. 154)

What this suggests is that logical reasoning needn't be propositional. It can be diagrammatic or cartographic. And since we actually do reason with diagrams and maps (as Shin (1994) and Camp (2007) argue), the above also suggests that not all *actual* logical reasoning is propositional. Some of it is diagrammatic or cartographic.

This in itself doesn't show that we engage in logical reasoning with any other kind of representation. But it should open us up to that possibility. And, indeed, I think it should open us up to the possibility that we can and

do engage in logical reasoning with the objects and properties that we perceive. For much of what can be said about diagrams and (especially) maps can be said about these contents of our perceptual states.

For example, like propositions and maps, perceptual states represent the world as being a certain way, and they do so by combining various representational elements in a structured way.¹⁸ Perceptual states are also like maps (but not necessarily propositions) in a number of other ways. Consider my visual awareness of the coffee shop. When I see my environment, I represent properties and objects as being in a certain spatial configuration. As with many maps, this representation is largely analog – it represents continuous spatial arrays and carries information specifying fine-grained property values, such as color values (Camp, 2007, p. 156). And, as with many maps, the structure of my visual experience is partially spatial – it represents things and properties as being in various locations around the room and in relation to each other.

It's natural to think that, at least in this and other “good” cases of perception, the world itself provides much of the formal structure and semantic character of perceptual states. However, your take on this will depend on your views about perception – a sense-datum theorist will say something different than a direct realist, for example. But whatever the immediate deliverances of perception are, they do provide sufficient structure to allow for a mapping of semantic elements in experience to properties and objects in the world, such that we can devise a schema for assessing their accuracy. Something like this is what I have in mind:

VERIDICALITY: Perceptual representation $*a^*$ of object/property a is veridical if and only if a is present/instantiated as represented.

Once we have such a principle in place, we can introduce “veridicality-preserving” inference rules, such as:

CONJUNCTION: If $*a^*$ is veridical and $*b^*$ is veridical, then $*a$ and b^* is veridical (example: if a perceptual representation of a table is veridical and a perceptual representation of a chair is veridical, then a perceptual representation of both a table and a chair is veridical.)¹⁹

And:

ADDITION: If $*a^*$ is veridical, then either $*a^*$ is veridical or $*b^*$ is veridical (example: If a perceptual representation of a table is veridical, then either a perceptual representation of a table is veridical or a perceptual representation of a chair is veridical.)

The above is made possible because the contents of perceptual states are, like sentences or propositions, made up of elements that represent the world as being a certain way. However, as with maps, logical reasoning with these perceptual elements is limited in certain ways. For example, while we may

draw disjunctive conclusions on the basis of what we perceive, disjunctions cannot themselves be represented in perception. The same goes for negation. Perceptual states are also limited in their ability to represent quantificational information. When I see the cashier, I represent him as *existing*, but I can't visually represent some universal generalizations, such as that every cashier is stressed. So logical reasoning with perception is limited.

Even so, that doesn't affect the main point here, which is that even logical reasoning is within the domain of reasoning with the things that we perceive. Hence, this last refuge of the orthodox is no refuge at all. The objectual contents of perceptual states are involved in and integrated into our reasoning at various levels, and not just as inputs to our reasoning, but as the very things we deliberate with and infer conclusions on the basis of. Thus, given New-from-Old, it follows that we know these things – i.e., the properties and objects that we perceive. These things are not propositions. Therefore, some knowledge is non-propositional.

4. Knowledge of things

Some knowledge is non-propositional. But what is this knowledge like? In this section, I'll give a brief account of it based on Russell's (1911, 1912) account of "knowledge of things." I offer this account as one way to build on the conclusions of the previous section. It is not the only way to do this. It might not even be the best way! So I welcome competing approaches. This is hardly the last word on knowledge of things.

Nor is it the first. Russell (1911, 1912), for example, held that there are two kinds of knowledge: knowledge of *truths* and knowledge of *things*. Russell says 'knowledge' in the former sense is:

... the sense in which what we know is *true*, the sense which applies to our beliefs and convictions, i.e. to what are called *judgments*. In this sense of the word we know *that* something is the case. (Russell, 1912, p. 69)

For Russell, knowledge of truths is propositional knowledge. And it is distinct from knowledge of *things*, which comes in two varieties: knowledge by *acquaintance* and knowledge by *description*. Russell describes acquaintance as follows:

I say that I am *acquainted* with an object when I have a direct cognitive relation to that object, i.e. when I am directly aware of the object itself. (Russell, 1911, p. 108)

Russell (1911) then describes acquaintance as the direct "presentation" of objects and properties to one's mind (p. 108) and says that, strictly speaking, we are only ever acquainted with sense data, our awareness of sense data, and a few other things. On Russell's view, acquaintance is *direct awareness*.²⁰ All other knowledge of things is thus indirect and counts as knowledge by

description. We know things by description when we know of them as satisfying a description or falling under a concept, such as “the cashier”, “the brown table in the corner”, or “*that* thing over there”. As Russell (1912, p. 73) points out, knowledge by description presupposes some knowledge of truths. For example, in order to know of the cashier as “the cashier”, I must know certain propositions about what cashiers are. Nonetheless, Russell holds that knowledge by description, which again is a species of knowledge of things, is distinct from knowledge of truths. My knowledge of the cashier as a cashier, for example, is not the same as, nor is it reducible to, knowledge of propositions.

Furthermore, on this account, not all knowledge of things presupposes or requires knowledge of truths. Take my knowledge of the color of my coffee, for example. I know of my coffee *as brown*. This knowledge requires that I possess the concept, *brown*, and thus it presupposes some background knowledge of truths about what brown is. But I also know of the *very specific* shade of brown of my coffee, for which I have no concept. This fine-grained knowledge of things does not presuppose or require knowledge of truths.

So knowledge of truths and knowledge of things are distinct. Whereas knowledge of truths is constituted by beliefs in propositions, knowledge of things is constituted by awareness of properties and objects.²¹ And while the two forms of knowledge do bear important relations to each other, they are independent of each other.

Some inessential details of Russell’s (1911, 1912) account are unpopular with contemporary philosophers (e.g., sense data). But these details are optional. The core idea here is just that some knowledge (i.e., knowledge of things) is constituted, not by beliefs in propositions, but by conscious awareness of properties and objects.²² As we’ve seen, paradigm cases come from perception and introspection.²³ When I see the cashier in front of me, I know of him. When I see eight tables, 12 chairs, the color of my coffee, etc., I know of these things (even though I may not know *that* there are eight tables or 12 chairs there). The same goes for other sense modalities. I can be aware of and thus know of properties and objects in my environment by smelling, hearing, tasting, or touching them. Also, when I introspect, I can gain self-knowledge – i.e., knowledge of my own mental states. For example, I can know of the headache that I feel, my anger at the cable company for raising rates, and my thoughts about the beach that figure in my planning.

There are various ways to flesh out these claims, depending on one’s view of the nature of perceptual and introspective awareness. For example, Russell says that perceptual awareness is a relation to sense data. Naïve realists, in contrast, say it is a relation to ordinary external objects (at least in veridical perception). Representationalists (or intentionalists) – which

constitute the majority in philosophy today – say that it is most fundamentally constituted by our *representing* properties and objects.²⁴ I've been talking like a representationalist. But knowledge of things can be described in ways suitable to other views as well.

There's plenty more to say about knowledge of things. For example, elsewhere I've suggested that there may be further necessary conditions on knowledge of things that are parallel to *truth* and *justification* for knowledge of truths (see, Duncan, 2020). But we needn't linger on further details here. The core idea is, again, that some knowledge is constituted, not by beliefs in propositions, but by awareness of properties and objects. And the above brief sketch should be sufficient to give some sense of my take on the kind of non-propositional knowledge that I've argued exists. In giving this Russellian account, I don't mean to imply that all philosophers who accept that some knowledge is non-propositional are, or should be, committed to every aspect of it. My aim in giving this account is to offer one way to think about the non-propositional knowledge that I've argued exists and to begin the process of further developing an account of that knowledge.

5. Connections

Knowledge of things is totally at odds with the standard practice in contemporary philosophy whereby all knowledge (save perhaps know-how) is propositional. So that there is knowledge of things is, in itself, a big result.

But knowledge of things also bears on other issues in philosophy. For example, there are ongoing debates about the epistemic significance of experience (see, e.g., Byrne, 2016) and the rationality of perception (see, e.g., Siegel, 2017) that knowledge of things is highly relevant to. The same goes for issues having to do with foundationalism, the Given, the Knowledge Argument, the Speckled Hen, self-knowledge, certainty, and transformative experience, to name a few. There are also farther afield connections – in ethics and philosophy of religion, for example, – that speak to the long reach of knowledge of things.

But one such connection that I think is particularly important emerges from the main focus of this paper. It's that recognizing knowledge of things has the potential to change the way we think about *reasoning*, and indeed, the way we reason. Not all premises are propositions – some good arguments depend on knowledge of things. So while recognizing knowledge of things is important both in itself and in relation to other debates within philosophy, what may be even more important is how recognizing knowledge of things has the potential to change the way we perceive philosophical reasoning and how we go about doing it.²⁵

Notes

1. As Peter Klein (1998) puts it, “One virtually universal presupposition [of contemporary epistemology] is that knowledge is true belief,” where belief is understood as an attitude toward a proposition (p. 27–33). Whether or not most contemporary philosophers *explicitly state* that all knowledge (save know-how) is propositional, this doctrine is consistently reflected in philosophical practice – propositional knowledge is all that’s talked about, for one thing – and it is presupposed in many debates that other kinds of knowledge would be highly relevant to. So, even setting aside who believes what, the idea that all knowledge (save know-how) is propositional is firmly embedded in contemporary philosophical tradition.
2. This is a rough characterization distilled from the literatures on reasoning in philosophy and psychology (see, Baghossian (2018), Broome (2013), Camp (2007, 2014), Harman (1986), McHugh and Way (2018), Siegel (2017, Ch. 5), Sloman (1996), Valaris (2018), and Wedgwood (2016) for discussions from various different perspectives). My rough characterization is intended to be as general, neutral, and non-question-begging as possible. I’ll neither offer nor defend a specific view of what reasoning is. Later I’ll consider and respond to objections according to which the mental activities in my cases do not count as genuine reasoning. But my responses, and more generally the merits of my cases, will not depend on any specific account of reasoning.
3. This is a variant of Fitelson (2017) and Luzzi’s, 2010, Luzzi, 2014) “Counter-Closure” principle.
4. Here Audi (2010) puts the point in terms of *inference*, which you might think is a specific kind of reasoning (though many use ‘reasoning’ and ‘inference’ interchangeably). But what he says about inference applies more generally to reasoning as described above. The point is, reasoning only transmits justification and knowledge – you can’t come to know some conclusion solely by reasoning on the basis of other information accessible to you if you do not know that that information is true or accurate.
5. For example, Fitelson (2017) argues that something like this principle *explains* knowledge from reasoning, and Warfield (2005) points out that this principle has been used to handle Gettier cases. Warfield (2005, p. 406) also lists a number of other motivations for the principle, and Audi (2010, Ch. 8) offers some more general remarks on its importance.
6. See, for example, Armstrong (1973, pp. 198–199), Nozick (1981, p. 231), Stanley (2005, pp. 89–90), and Williamson (1994, p. 222).
7. This is an orthodox assumption, but it does have some detractors. Gluer (2009) contends that experiences are beliefs, and Byrne (2016) contends that experiences are partly constituted by beliefs.
8. I take no stand on what the *immediate* objects of perception are. Direct realists think they are objects and properties in one’s environment. But one alternative view is that properties instantiated in our experiences are the immediate objects of awareness.
9. Specifically, I’ll remain neutral on whether reasoning must be conscious, or involve deliberation, reckoning, or “taking”, or whether it merely requires the ability to disown its conclusion.
10. Note that the *conclusion* of this reasoning is a proposition. It may be that some conclusions of reasoning are non-propositional, but keep in mind that my claim here (and in the cases to follow) is just that the knowledge-conferring *bases* of reasoning are sometimes non-propositional. And it doesn’t even have to be *all* of the bases of an

instance of reasoning. As long as *some* of the bases of knowledge-conferring reasoning are non-propositional, then, given New-from-Old, some knowledge is non-propositional.

11. Perhaps the most plausible way to construe the contents of these beliefs is as containing demonstrative concepts – e.g., *that* sound, *this* look, etc. (see, e.g., Brewer, 1999; McDowell, 1994) – since it's very implausible that we have non-demonstrative concepts for all of the fine-grained perceptual information involved in the relevant reasoning (though, elsewhere I've argued that even the demonstrative view cannot account for all of the fine-grained perceptual knowledge that we have (see, Duncan, 2020)). With that said, I'll remain neutral in the arguments to follow on how defenders of the orthodox, propositionalist view of knowledge might construe the contents of such beliefs.
12. Such contextual factors may include the time of day, how others are reacting to the waiter, and various details about the physical environment. Here I don't mean to suggest that *every* background contextual detail that is relevant to a given association, or that is part of the explanation for why that association has been formed, has to be thought about explicitly or has to be the conscious basis of that associative reasoning. The point here is rather that *some* contextual details are parts of the knowledge base for a given association. For example, in order for the time of day to be incorporated into a knowledge-conferring association, one must be aware of (and know) the time of day. Or, in order for details about the loudness and busyness of the coffee shop to inform my knowledgeable association about the waiter, I must be aware of (and know) such details. But, again, it's doubtful that we have beliefs about every such detail that is (or may potentially be) part of the knowledge base for associating a look and/or sound with sarcasm.
13. Frank Hofmann (2014), for example, contends that experience itself counts as “non-conceptual knowledge” – a non-doxastic but propositional form of knowledge.
14. There may be cases similar to the ones I've described where the association is a brute, non-deliberative causal process. But we can set those cases aside. As long as *some* cases of association are both genuine reasoning and have non-propositional bases, then, given New-from-Old, some knowledge is non-propositional.
15. Also, association clearly fits with the motivations for New-from-Old. Recall, Audi (2010) points out that reasoning only ever *transmits* justification and knowledge – that it can't produce new knowledge if there's not already knowledge there to begin with. And that's true of association. One can't learn something via association (e.g., that a waiter is displeased) if one doesn't know its bases (e.g., how the waiter looks and sounds).
16. While this was controversial at first (see, Block, 1982, for an overview), Shepard and others were able to replicate their results in various experimental designs in ways that heavily supported their initial conclusion. Now the existence of mental rotation is widely accepted by philosophers and psychologists (see, Nigel, 2017).
17. Another relevant literature is on the nature and logic of *pictorial* representation (see, e.g., Crane, 2009; Greenberg, 2013; Sober, 1976; Tichy, 1988; Westerhoff, 2005). However, recent contributions to this literature have been mixed in terms of their applicability to knowledge of things. Thus, to avoid confusion, I will not appeal to this literature here.
18. Here I'm assuming a representationalist (or intentionalist) view of perceptual experience. But many of the main points here and in what follows could be reformulated so as to suit other views of perceptual experience, such as naïve realism or the sense-datum theory. For example, naïve realists and sense-datum theorists may say that the

- structure I just mentioned is provided either by the world itself (of which we are directly aware) or by relations between sense data. Then they may say that the process of reasoning with these items of experience is partly representational (even if its experiential bases aren't) or that it is nonrepresentational and instead constitutively involves relations to external objects, sense data, or other entities such as universals.
19. Here (and below) I am stating these rules in a meta-representational way, parallel to a meta-linguistic statement of a propositional rule (e.g., If “P” is true and “Q” is true, then “P and Q” is true). The rules that I am introducing can be stated without the “* *” (e.g., If a, b, then a and b), just as propositional rules can be stated without the “ ” (e.g., If P, Q, then P and Q). I've chosen to state the rules in a meta-representational way just to underscore that the reasoning is with the contents of perception.
 20. Thus, Russell's (1911, 1912) notion of ‘acquaintance’ is different from the ordinary sense of ‘acquaintance’, as in “Hector and Paula are acquaintances” (or related knowledge attributions, such as “Hector knows Paula”). For one may be acquainted with something in the latter sense without being directly aware of it. For example, my neighbor and I are acquaintances even at moments when I am not directly aware of her. So Russell's sense of ‘acquaintance’ is best thought of as a philosophical term of art.
 21. To flesh the metaphysics of this out just a bit, I take knowledge of truths (or propositional knowledge) to be constituted by a subject's bearing a certain relation – namely, the *belief* relation – to a proposition. Knowledge of things differs in both relation and content. When a subject knows of things, the relation she bears to a content is the *aware of* (or conscious of) relation. And the contents of her knowledge are properties and objects – colors, shapes, coffee, people, etc. – not propositions. Hence, knowledge of truths and of things differ both in their relation and content.
 22. While the orthodox assumption in contemporary analytic philosophy is that all knowledge is propositional, a few philosophers do endorse knowledge of things. They include Atiq (2021), Campbell (2014, pp. 13–14), Coleman (2019), Conee (1994), Duncan (2020, 2021a, *forthcominga*, *in press*), Grzankowski and Tye (2019), McGinn (2008), Pitt (2019), Prinz (2016), and Tye (2009). Some other philosophers defend similar claims. For example, Eleanor Stump (2010) and Lorraine Keller (2018) talk about “Franciscan knowledge,” which is similar to knowledge of things. M. Oreste Fiocco (2017) defends a Brentano-inspired account of something like knowledge of things. Matthew Benton (2017) talks about interpersonal knowledge, which is non-propositional and may be a species of knowledge of things. And Frank Hofmann (2014) argues that perceptual experience is “non-conceptual knowledge,” which is non-doxastic (though propositional). It may be that there are other philosophers out there who just haven't thought about this issue, or are just focused on other things having to do with propositional knowledge, or for whatever other reason are not *opposed* to knowledge of things (maybe they even like the idea). But it's safe to say that knowledge of things has been largely ignored by contemporary analytic philosophers.
 23. As I mentioned earlier, one popular view is that the contents of perception are (or include) propositions. If that's your view, then just note that what I'm talking about as the contents of knowledge of things are the individual objects and properties of which I am aware – what may be the *constituent parts* of perceptual propositions. So, even if you think that perception is propositional, there's still room for knowledge of things.
 24. Some philosophers insist that acquaintance (which is a species of knowledge of things) is not, and indeed couldn't be – perhaps even by definition – intentional or representational (see, e.g., BonJour, 2003; Brewer, 2019; Campbell, 2014; Fumerton,

1995, p. 74; also see, Raleigh, 2019, pp. 8–9, for discussion). Nonetheless, the acquaintance theory is increasingly popular among representationalists and representationalism is increasingly popular among acquaintance theorists (see, Duncan, 2021b, for an overview). For discussion of how representationalists can square their view with the acquaintance theory, see, Pautz (2021, §5.4).

See, for example, Cutter (2018), Dretske (1995), p. 73, Maloney (2018), and Tye (2009).

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