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Awareness of ignorance

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Abstract: Despite the recent increase in interest in philosophy about ignorance, little attention has been paid to the question of what makes it possible for a being to become aware of their own ignorance. In this paper, I try to provide such an account by arguing that, for a being to become aware of their own ignorance, they must have the mental capacity to represent something as being unknown to them. For normal adult humans who have mastered a language, mental representation of an unknown is enabled by forming linguistic expressions whose content is grasped, but whose referent is unknown. I provide a neo-Fregean, a neo-Russellian, and then a unified account of this. On that basis, I then argue further that the content of ignorance can always be captured by a question. I then distinguish between propositional ignorance and non-propositional ignorance and argue that propositional ignorance attributions can be of three types, that-ignorance, whether-ignorance, and fact-ignorance. I conclude by arguing that the acquisition of truths, even when it yields knowledge that is certain, does not always eliminate one's ignorance and that there is a degree of ignorance in almost everything we claim to know.

1 Introduction

Humans may be the only species on earth that have the aptitude to become aware of their own ignorance. This peculiar skill plays a pivotal role in our daily deliberations, decisions, and actions as well as our communication with others; it allows us to enjoy the mental state of curiosity, being our primary motivator to ask a question to others (as a speech act) or to ourselves (as a mental act) and then inquire into the unknown, individually or collectively; without it, science, philosophy, technology, literature, religion, and advanced forms of art, which have shaped modern human cultures, would not have been possible. Although the notion of *awareness of ignorance* and its close cousins have been in use within the philosophical literature for more than two millennia, there are a host of interesting philosophical questions concerning awareness of ignorance that have not been discussed in depth by philosophers, some not even ever

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addressed. How is it all possible for a being to become aware of their ignorance? Is it a mental state? Does awareness of ignorance require mentally representing an unknown? Is ignorance gradable, i. e., does it come in degrees? How does awareness of ignorance relate to asking a question? Does awareness of ignorance always have propositional content? Is the acquisition of propositional knowledge always sufficient to eliminate one's ignorance? Various specialized areas of research within philosophy and cognitive science could have addressed these questions as special topics of interest; they relate to various ongoing debates within epistemology, philosophy of mind, philosophy of language, as well as a host of related specific fields such as action theory, mental representation, meta-cognition, theory of mind, decision theory, the logic of questions and answers, the philosophy of curiosity, and virtue epistemology.[1] In what follows, I wish to address these questions, although I shall only have space to discuss some of them in depth.[2] My focus is on the awareness of one's own ignorance, rather than the awareness of the ignorance of others.[3]

2 Mental representation of unknowns

Every being with a mind is ignorant of many things, but only some of those beings have the capacity to become aware of their ignorance, and even for them, this capacity is exercised only in some special circumstances. For a subject to become aware of their ignorance, they need to be in a peculiar state of knowing

1 There is a wide literature on ignorance that addresses various questions concerning what ignorance is, willful ignorance, ignorance as a moral or a legal excuse, Rawlsian "veil of ignorance," ignorance as bliss, the KK-principle, the fallacy of the appeal to Ignorance, etc. but to my knowledge, none of these works directly addresses the issues I raise and discuss in this paper on awareness of ignorance. I will make use of some of this literature throughout the paper as far as it is relevant.

2 In this paper, I will presuppose and not argue that awareness of ignorance almost always is epistemically valuable, in the sense that it is epistemically better for an agent to be aware of their ignorance rather than be ignorant of it. No doubt there may be exceptions. For instance, Pritchard (2016) gives a compelling argument that being ignorant of a misleading fact may be epistemically more valuable than knowing it.

3 Awareness of the ignorance of other minds is a neglected topic worthy of discussion on its own, especially in relation to the wide literature on the Theory of Mind, i. e., our ability to become aware of the mental states of others. Although I do not have space to discuss this in any detail, I will point out in the end that, what I call "joint ignorance" is a special and very important instance of joint attention.

that they do not know something.[4] This requires the subject to think about something they have in mind *as* being unknown to them. Upon observing the dead body of a certain Smith at a murder scene, Holmes may utter "I am ignorant who Smith's murderer is." On such an occasion, there is a good sense in which Holmes has a thought *about* a murderer unknown to him. When Socrates says, "I do not know what virtue is," he expresses a thought *about* something of which he is ignorant. Scientists investigating whether there is liquid water on Mars had thoughts *about* something that they did not know. In each and every case of awareness of ignorance, someone thinks about something that they believe to be unknown to them. Assuming that to have a thought about something requires one to represent that thing in their mind, it follows that in order for a subject to become aware of their ignorance, they need to mentally represent something *as* being unknown to them. The idea that unknowns can be the objects of mental representation may initially sound odd: how can you mentally represent something and not know the very thing that you represent? Although this question has not attracted the attention of philosophers, I believe this must have perplexed Plato, as formulated in his famous riddle concerning inquiry in the *Meno*: "How is it possible to inquire into something? If you know it, then you don't need to inquire into it, and if you don't know it, then you don't know what it is you are inquiring into?" Although this riddle has given rise to a large literature, mostly within Plato scholarship, it has not been tied to the question of how awareness of ignorance is possible, and more specifically: how one can mentally represent an unknown.[5] If Plato had been able to formulate a notion such as *the mental representation of an unknown*, perhaps he would not have sought a solution in his infamous Theory of Recollection. Plato scholars have suggested other solutions to the riddle that are more common-sensical. One suggests that to inquire into the unknown requires one to have partial knowledge of the object of inquiry, based on the assumption that knowledge is not an all-or-nothing affair.[6] On such an account, it should follow that in order to become aware of your ignorance about something, you need to have partial knowledge of that very thing, which allows you mentally to represent it. This may initially sound contradictory, for it attributes

4 The idea that awareness of ignorance is simply knowing that you do not know has been challenged by Peels (2010) and then defended by Le Morvan (2011). I will address this issue later in the article in the section on propositional ignorance.

5 See İnan (2012), *Chapter 1 Meno's Paradox and Inostensible Conceptualization.*

6 Scott (1995) endorses the partial knowledge solution, whereas G. Fine (1992) adopts what is usually referred to as "the true belief solution"; for an argument against the true belief solution, see Devereux (2008), and for arguments against both solutions, see İnan (ibid.).

both knowledge and ignorance about the very same thing to the same agent, but if knowledge comes in degrees, then so does ignorance. To become aware of his ignorance regarding what virtue is, it may then be said that Socrates needed to have partial knowledge of what virtue is, which is what enabled him to know what it is that he was inquiring into. Given that there was a lot more for him to know about what virtue is, we may then conclude that he had a low degree of knowledge of virtue and a high degree of ignorance. This view has a certain appeal, for it could account for various cases of awareness of ignorance. You may know a bit of chemistry, being aware that there is a lot more for you to learn on the topic; you may have some experience of a city, knowing that there is a lot more to be explored, etc. As intuitive as it may initially sound, this view does not get to the heart of the matter. What partial knowledge is required for scientists to become aware of their ignorance as to whether there is liquid water on Mars? Of course, their knowledge of Mars was and still is incomplete; if they knew all there is to know about Mars, they would not have been ignorant as to whether it contains water. This, however, does not specify the very thing of which they were ignorant; what they mentally represented – what they conceived – *as* being unknown to them was not Mars as an object, but whether it contains water. Furthermore, what occurs when whatever one represents as being unknown to them turns out not to exist? A pre-Euclidean mathematician could have said, "I am ignorant as to what the largest prime number is," being convinced that there is such a number. Here, the object of ignorance is supposed to be the largest prime number, which turns out not to exist, and thus, no partial knowledge of it is possible. Having partial *de re* knowledge of the object of ignorance cannot be a necessary condition of awareness of ignorance.[7] In order to account for how awareness of ignorance is possible, we need to specify the kind of knowledge required for one mentally to represent an unknown. For normal adults who have mastered a language, such knowledge, as I shall now argue, is semantic in nature; it is what may be called "conceptual knowledge." To demonstrate this, we need to distinguish between the content of a mental representation and its object. In those cases when the content is conceptual, the distinction amounts to the distinction between a concept and that object of which it is a concept. When the content can be put into words, we have the more general distinction between the meaning of a term and its referent. Crucial is that representing something does not require us to have experienced the object so represented; grasping a concept does not always require us to know its object; understanding the meaning of a linguistic expression does not always require us to be acquainted with its referent.

7 For a detailed discussion of this argument, see İnan (ibid.).

2.1 A neo-Fregean account

Although the distinction between meaning (sense, connotation) and reference (denotation) was present in the writings of some authors before the twentieth century (most notably, John Stuart Mill), Gottlob Frege first elaborated a semantic theory based on it. Frege held that the sense (*Sinn*) of a linguistic expression is a "mode of presentation" of the entity that is its referent (*Bedeutung*); he then argued that by grasping the sense of an expression, we are able mentally to represent its referent. Senses, on Frege's account, belong to an objective third realm and, therefore, are not mental entities; grasping a sense, on the other hand, is to be in a certain mental state, one that represents that sense. This Frege called *Vorstellung* (usually translated as *idea*), which he thought was too psychologistic to deserve any further philosophical attention. To represent an object requires one to first represent a sense through an idea, and that sense (in effect) represents that object. This is how we are able to think about, represent, and refer to an object.[8] Although Frege never considered the question, how unknown objects can be mentally represented by an agent through such a process, his theory definitely allows for it:

> The sense of a proper name is grasped by everybody who is sufficiently familiar with the language or totality of designations to which it belongs; but this serves to illuminate only a single aspect of the referent, supposing it to exist. Comprehensive knowledge of the referent would require us to be able to say immediately whether every given sense belongs to it. To such knowledge we never attain. (Frege 1892, 210–211)

Given an object that we can think about and a sense that we grasp, we may not always know whether that sense belongs to it. This could happen when we have considerable, but not comprehensive knowledge of both the object in question and the referent determined by the sense that we are considering, but we do not know whether this particular sense is true of the object. Our ignorance could then be captured by an identity statement. Babylonians, for instance, had considerable knowledge of the heavenly body they called "Hesperus," but they did not know that the sense they attached to the name "Phosphorus" was true of it – despite the fact that they had considerable knowledge of Phosphorus as well. But it should also follow from what Frege says here that grasping a sense does not always require an agent to have considerable knowledge of its referent. We can easily grasp the sense of the term "the closest planet to Earth on which there is liquid water," and when we are asked whether this sense belongs to (or

8 It is quite an odd historical fact that the wide literatures on mental representation and reference have not intersected much. The idea that mentally representing an object is a form of (speaker's) reference can be found in Burge (2010).

is true of) Mars, we may admit we do not know this. In fact, no one may know this. Unlike the Hesperus/Phosphorus case, this time, we could admit that we do not know of any object as being the referent of this expression. Here, our ignorance is not only about whether an identity statement is true or false, but we are also ignorant of the referent of an expression. Grasping a sense does not, as such, put us in close epistemic contact with its referent. That Frege allows for this is further indicated by another example he gives:

> It may perhaps be granted that every grammatically well-formed expression representing a proper name always has a sense. But this is not to say that to the sense there also corresponds a reference. The words 'the celestial body most distant from the Earth' have a sense, but it is very doubtful if they also have a reference. (Frege 1892, 211)

If one knows the description has no referent, no ignorance is involved, but if it is "doubtful" whether that is the case, then one does not know whether the description does have a referent. Clearer examples can be given; we can easily grasp the sense of the description "the closest planet to Earth on which there is intelligent life" and presumably none of us knows whether it has a referent. There can also be a description that we may know to refer to an object, without having any further knowledge of that object. One may, for instance, know that "the closest planet to Earth that has exactly 6 moons" must have a referent, when all that they know is that such a planet exists and whatever can be deduced from the description and the relevant background knowledge. There can also be cases in which we know that a description has a referent of which we have some knowledge, but we do not know which object that is. Even if you have some knowledge of all the planets in our solar system, you may not know which one is "the planet that has the most amount of iridium on it"; you may know that you have substantial knowledge of the object in question, but not under the given mode of presentation. The thrust of the matter is that under the Fregean theory, grasping the sense of a term does not always require one to have knowledge of its referent. This is all the more apparent when the term in question is a full declarative sentence; grasping the sense of a sentence allows us to entertain a thought (*Gedanke*), but that does not require us to know what its referent is, which according to Frege is one of the two peculiar objects that he called "the True" and "the False."

A Fregean account of awareness of ignorance requires us to extend Frege's semantic distinction between the sense and the referent of an expression to get the epistemic distinction between an agent's knowledge of the sense of an expression and the agent's knowledge of the referent of that expression.[9] For an

9 This crucial distinction between *knowledge of meaning* and *knowledge of referent* is partially semantic and partially epistemic, which unfortunately has been completely ignored both by

agent to become aware of their ignorance, there must be a sense that the agent grasps through which they mentally represent the object that is determined by that sense. This could happen in any one of three cases: either the agent does not know whether there is such an object; the agent knows that there is such an object but has no knowledge of that object except for what can be trivially deduced from the information content of that sense; or the agent knows that they have some knowledge of that object but not under the mode of presentation of the sense in question. For all three cases, we may distinguish between two aspects of mentally representing an unknown; there is first the content of the representation of the unknown object, which I shall call "the content of ignorance," and the unknown that is represented by that content, which I shall call "the object of ignorance." Even if one does not endorse the Fregean distinction between sense and reference, this more general distinction is still genuine.

2.2 A neo-Russellian account

The preceding neo-Fregean account may seem to be incompatible with Russell's semantic theory, which appears to reject the distinction between the meaning of an expression and its referent. If so, would it then follow that Russell's theory cannot account for how we can mentally represent unknowns and become aware of our ignorance? Definitely not. In fact, Russell not only had all the resources to give such an account, but he also could have made a finer distinction between a strong and a weaker sense of awareness of ignorance, by appealing to his distinction between "knowledge by acquaintance" and "knowledge by description":

philosophers of language and by epistemologists. See İnan (2012) for a detailed discussion of how this distinction relates to Russell's distinction between knowledge by acquaintance and knowledge by description, Donnellan's distinction between the referential and attributive uses of definite descriptions, the *de re*/*de dicto* distinction, as well as Kripke's distinction between rigid and accidental designators. Some linguists have appealed to a similar distinction using the catchy jargon, "word knowledge" versus "world knowledge" to address the question of what kind of empirical knowledge is required in order to grasp the meaning of a word, and some argued that having knowledge of the referent of a word does not always give one knowledge of the meaning of that word (see Kegl 1987), which is reminiscent of Russell's famous slogan that "there is no backward road from denotations to meanings." What is important for our purposes is of course its converse; having knowledge of the meaning of a linguistic expression does not always give us knowledge of its referent. Granted that without having world experiences you cannot grasp the meanings of words, but after you have sufficient experience to grasp certain concepts that are expressed by words in your idiolect, and you have some syntactic knowledge, then you can put some of these words together to compose a complex novel expression, grasp its content, but have little or even no knowledge of its referent.

> I shall say that an object is 'known by description' when we know that it is 'the so-and-so', i. e. when we know that there is one object, and no more, having a certain property. ... We know that the candidate who gets the most votes will be elected, ... but we do not know which of the candidates he is, i. e. we do not know any proposition of the form 'A is the candidate who will get most votes' where A is one of the candidates by name. We shall say that we have 'merely descriptive knowledge' of the so-and-so when, although we know that the so-and-so exists ... yet we do not know any proposition 'a is the so-and-so', where a is something with which we are acquainted. (Russell 1912, 113)

Here, the agent has both knowledge and ignorance of the very same person, but no contradiction emerges from this because the available knowledge is knowledge by description, although the knowledge that is absent is knowledge by acquaintance. This is how one may, without falling into a contradiction, become aware of their lack of acquaintance of an entity. These would then be cases of awareness of ignorance in some strong sense. Russell of course held (at that time) that all our knowledge of particulars external to our minds is knowledge by description and never knowledge by acquaintance. Although such an account may have the merit of showing us the limits of our knowledge, it certainly cannot give us a full account of ignorance, since under normal conditions when we are aware of our ignorance concerning an external particular object, we do believe that we can achieve some epistemic progress in overcoming our ignorance even if it never yields complete acquaintance of that object.

Knowledge by description is a broad category for Russell, in that it holds of our knowledge of things by perception:

> My knowledge of the table as a physical object ... is not direct knowledge. Such as it is, it is obtained through acquaintance with the sense-data that make up the appearance of the table ... . My knowledge of the table is of the kind which we shall call 'knowledge by description'. The table is 'the physical object which causes such-and-such sense-data'. (Russell 1912, 47)

These two examples Russell talks about, one concerning the candidate who gets the most number of votes and the other concerning the table, are supposed to be both cases of knowledge by description, but quite obviously there is a sharp difference between them. In the first example, one could legitimately ask the question "who is the candidate who will get the most number of votes?," but no analogous question seems to suggest itself in the second case.[10] By asking such a question, one implies their ignorance of the person in question, which could

10 There has been little discussion of this problem within Russell scholarship (see Bar Elli, 1989).

be either a lack of knowledge by acquaintance or a lack of knowledge by description of the person in question. If the former is the case, then the question is unanswerable, so why ask? And the latter apparently cannot be the case, given that one already knows the person in question by description, so again, why ask? But we can ask such questions, and we frequently do. And when we do so, we normally imply our ignorance in a weaker sense. Had Russell been interested in the topic he could have posited a third category that he could have called "ignorance by description." Your knowledge of a table in front of you could then be a case of knowledge by description, but in the case of the candidate who will get the most number of votes, you could be said to possess ignorance by description. Although *acquaintance* is an absolute term that does not admit of degrees, Russell did acknowledge, in a short passage, that one's epistemic connection to a particular can come in degrees:

> It will be seen that there are various stages in the removal from acquaintance with particulars: there is Bismarck to people who knew him, Bismarck to those who only know of him through history, the man with the iron mask, the longest-lived of men. These are progressively further removed from acquaintance with particulars ...'. (Russell 1910, 116)

In each case, we have a denoting phrase in which the agent knows that there is one and only one particular that satisfies it, and the epistemic connection of the agent to that entity gets weaker and weaker. No matter how much we are removed from acquaintance though, these are all supposed to be cases of knowledge by description. The only kind of ignorance Russell appears to acknowledge is our lack of acquaintance with these particulars. There is, however, a good sense in which someone "who knew Bismarck" is not ignorant of Bismarck, but someone who merely knows that there is one and only one entity who is the longest-lived of men, may not know who this person is. It would be quite awkward for a friend of Bismarck who knows him well to ask the question "who is Bismarck?," but it would be very natural for someone who does not know who the longest-lived of men is to ask "who is the longest-lived of men?" When we ask such a question our goal is not to acquire complete acquaintance with the person in question; that would make the question unanswerable. Just like when one says, "I know who Bismarck is," we do not take him to be acquainted with Bismarck; when one says "I do not know who is the longest-lived of men," we do not normally take him to imply his lack of acquaintance. In the first case, one may have a very rich mental file of Bismarck, but in the second case, one may possess merely a definite description and whatever follows from it. Obviously, there is a significant epistemic difference between these cases, so much so that we may take the first to be an example of

knowledge by description, whereas the second case may be said to be an instance of ignorance by description.

Although Russell denied the distinction between sense and reference, his Theory of Denotation, as layed down in Russell (1905), is itself sufficient to give an account of awareness of ignorance. First, grasping a proposition (constituted by the objects with which one is acquainted, which are denoted by the logical parts of a sentence denoting that proposition) does not require one to know whether it is true or false, which is an instance of what I shall call "propositional ignorance." Second, when we consider a definite description, its denotation appears at two distinct levels; within a sentence, it dissolves into quantifiers, sense-data, and properties; but it also denotes an object in the outer world, regarding which we may be ignorant, either in the strong or the weaker sense; this is an instance of what I shall call "non-propositional ignorance."

2.3 A unified account

The process by which we represent an unknown and become aware of our ignorance can then be put as follows:

> We mentally represent entities that we have experienced and thus are known to us to some degree;
> we then merge two or more of these representations together by utilizing some syntactic rules to produce a complex representation whose object we have not experienced which is partially or completely unknown to us;
> by an act of epistemic self-reflection we come to realize that this complex representation determines an object that is unknown to us.

It follows then that awareness of ignorance is:

> an *intensional* state in that it has conceptual content,
> an *intentional* state since it is always *directed to*, or is *about* the object of ignorance which is determined by the intensional content,[11]

11 That awareness of ignorance is an intentional state does not imply that the object of ignorance is a specific particular entity, or a concept. One may be ignorant of a large field of research such as chemistry and become aware of this. One can even become aware of their ignorance about everything that is unknown to them. If I were to say, "I am aware that I am ignorant of many things," there is no specific unknown that my ignorance is about. Even then, my mind is still directed toward the collection of all the unknowns that can be captured by a definite description such as "the totality of things unknown to me," making my ignorance an intentional state.

> a *meta-representational* state, since it requires the agent to represent a representation as determining an unknown object.[12]

There are now some finer points that may be more controversial. One is the problem of existence. When I claim that mentally representing an unknown is an intentional state, I mean it in a weak sense of intentionality, which does not entail the existence of such an object. When Le Verrier was aware of his ignorance concerning the planet perturbing Mercury, his ignorance was directed toward what he thought to be an unknown planet, which he dubbed as "Vulcan," only to find out that there is no such planet.[13] Here, the basic existential presupposition of ignorance turns out to be false. Even if one rejects the idea that mental representation is involved in such a case, it is still an obvious example of awareness of ignorance and it is also a clear counter-example to the view (that is *prima facia* plausible) that in order to be aware of your ignorance of something you must have partial knowledge of it.

Another controversy is the problem of causality. Causal theories of mental representation claim that there must be a causal relationship between a mental representation and its object. To mentally represent, say, the moon, we need to have some causal connection to it. In such cases the object itself is partially responsible, in causal terms, for our mental representation of it. Such a view is also true of many cases of mental representations involved in awareness of ignorance. When you hear a knock on the door, and you do not have a clue who it might be, that would, under normal circumstances, immediately cause you to construct in your mind a representation of *the*

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12 In a recent paper, Battistelli and Farneti (2015) briefly touch upon this issue: "In our opinion, there is another important topic related to meta-representation which does not get the attention it deserves, maybe because it is a kind of "non-representation." We are referring to "ignorance," i. e., absence of knowledge." Credit ought to be given to the authors first for bringing up the significance of the topic of ignorance by noting that it "does not get the attention it deserves," and more importantly, for relating the topic of ignorance to meta-representation. Their diagnosis of the lack of attention to the topic however is very odd; how can ignorance be a "kind of 'non-representation'"? What does that even mean?

13 The phenomenon of empty names has been a major worry for representation theories. In his seminal paper, Stampe (1977) argues that Le Verrier did have a mental representation of an existing entity when he had Vulcan-thoughts is his mind, by shifting the reference-fixing description of the name so that we make sure that it has a referent. For instance, if we were to take the reference-fixing description of the name as "the cause of the discrepancy between the theoretical and the observational results concerning the orbit of Mercury," then the name does in fact refer, not to a non-existing planet, but to an existing cause. This is completely ad hoc, and it may not capture Le Verrier's mental state of ignorance.

person knocking on the door. Dinosaurs became extinct some 65 million years ago, leaving behind traces that allowed us to represent to ourselves the cause of their extinction, which is still unknown. The casual thesis can account for such cases where the object of ignorance is causally responsible for us having a mental representation of it. This, however, is not always the case. Scientists were eager to know if there is liquid water on other planets within our solar system, which led them to construct a description such as "the closest planet to Earth which naturally contains liquid water" by which they were able to represent an unknown planet. There was some evidence that this could have been Mars, but it was not conclusive. Assuming that Mars is in fact that planet closest to us on which there is liquid water presently, the question we should ask is this: was the evidence of there being water on Mars causally responsible for scientists having this mental representation? If the observation of the indirect evidence of liquid water on Mars motivated them to construct this description, then there is a causal connection; but it could have been just the other way around; they may have constructed the description first, and then start seeking what its referent could be, if there is one, which is presumably historically more accurate. Sometimes we experience the indirect causal impacts of an entity that motivate us to construct such a description, and yet at other times, we use our imagination and creativity to construct a description and we realize that its referent is unknown to us. In the latter cases, the object in question does not appear to be causally responsible in any way for us to construct the description by which we are able to represent an unknown entity. All in all, we may say that when an agent is aware of their ignorance, the unknown object may be represented in two different ways; in one case, the unknown object is causally responsible for the representation, in the other case, it is not.

This unified account suggests that awareness of ignorance also has an ethical dimension, in an Aristotelian sense. Merely constructing a content whose referent is unknown, by itself, is not sufficient for an agent to become aware of their ignorance. One may entertain a representation without realizing that they are ignorant of its object, if they are simply uninterested in the topic, or they may think that they know, when in fact that they do not, or they may simply not have the meta-cognitive ability to come to realize their ignorance. This requires them not only to possess the capacity for meta-representation, but may also require certain traits that may be considered as epistemic virtues, such as conceptual creativity, inquisitiveness, open-mindedness, epistemic humility, curiosity, etc. This issue ought to be addressed in the emerging field of virtue epistemology.

3 Questions and ignorance

I have argued that awareness of ignorance requires one to form *a complex representation whose object is unknown that is created by the merging of simpler representations whose objects are known*. This may initially sound a bit too technical, but in fact we have a word for exactly that kind of thing in ordinary language: we call it a "question." As I have argued in length in earlier work, asking a question out of curiosity requires us to mentally represent an unknown, in which the content of our mental representation is identical with the content of that question.[14] By introducing the notion of *mental representation of an unknown*, I am not really positing a novel concept; it is something we are all familiar with and utilize daily. That is not to say that our ability to ask a question whose answer is unknown to us is the same ability of forming a mental representation of an unknown. That is because asking a question out of curiosity typically causes an epistemic desire to convert an unknown into a known, but merely becoming aware of one's ignorance does not motivate such a desire. The primary function of asking a question is to express one's curiosity, not to express one's ignorance, although the latter is a precondition of the former. It is perhaps possible to imagine there being a species whose members have the ability to become aware of their ignorance, but are never curious, and thus do not ask questions. Such a consideration may sound too far-fetched, but in fact it relates to issues that we all would care to know about. Do some animal species, apart from us, have the ability to become aware of their ignorance? Do pre-lingual children have such an ability? Did our ancestors, prior to the emergence of language, have such an ability? These I will leave as open questions. To tackle them, we would have to consider more primitive forms of mental representations that do not require the mastering of a language. For instance, if we can represent in the form of mental images, then this we share with most animals. Whether an imagistic representation has conceptual content is a controversial issue that we can set aside. The interesting question that arises here is whether a being can have the capacity mentally to represent an unknown through images only. This would require them to merge two or more images to form a new complex image of something unexperienced. If one has the image of a horse, and the image of a horn, can it then construct an image of a *horse with a horn*? If some animals that do not possess language have such a capacity, then it may be possible for them to form such representations; this alone would not be sufficient for them to become aware of their ignorance, unless they also have the meta-

14 See İnan (2012), *Chapter 2 Asking and Answering*, and İnan (2018).

representational talent to come to realize that what they are representing is unknown to them. Would that require them to possess some higher-order epistemic concepts such as *knowledge*? Putting aside such issues, let us consider in more detail the relations between awareness of ignorance and asking questions.

Aristotle was perhaps the first to distinguish between what-questions (generally referred to today as wh-questions) and whether-questions. When you ask what something is, who someone is, why something happened, etc., you do not have in hand a proposition that you wish to know whether it is true or false, but when you ask a whether-question you do. This suggests a more general distinction between a question that has propositional content, and one that does not. Correspondingly, there must be two separate categories of ignorance as well. There are a number of reasons why it is important to distinguish between cases of ignorance whose content is a proposition (henceforth "propositional ignorance") and cases in which it is not (henceforth "non-propositional ignorance").[15] First, this will allow us to be clear about what is the object of ignorance for each case and what the subject mentally represents as being unknown to them. Second, it will constitute a serious challenge to those who are inclined to hold that one can always overcome their ignorance by acquiring knowledge of truths. Third, it will enable us to lay down more precisely the kind of knowledge required for awareness of ignorance.[16]

We are all ignorant as to whether there is intelligent life on other planets. What is unknown in this case is the truth value of a particular proposition. This is a typical case of propositional ignorance. (I shall argue later that that not every case of propositional ignorance is of this kind.) We also do not know what caused dinosaurs to become extinct. Here, there is no particular proposition whose truth is unknown to us. The content of our ignorance here can only be captured by a singular term, rather than a full sentence: *the cause of dinosaurs' becoming extinct*. This is a typical case of non-propositional ignorance. For every

15 In an earlier work İnan (2016a) I preferred to use the notion of "objectual ignorance" to express what I now call "non-propositional ignorance." Demicioğlu (2016) raised several interesting objections to the way in which I made this distinction, to which I replied in work, "Afterthoughts on Critiques to *The Philosophy of Curiosity*" (İnan 2016b). As a result of this exchange, I now think that it is better to call the latter kind of ignorance "non-propositional."

16 Failing to make the distinction between propositional and non-propositional ignorance may lead one to the mistaken view that all cases of awareness of ignorance has to do with uncertainty. See, for instance, Smithson (1989). I take it that one can only be uncertain about the truth of a proposition, but as I shall soon argue not every instance of ignorance is about truth. Later, I shall also argue that even if one is certain of the truth of a proposition, they may still be ignorant of the fact that makes it true.

case in which an agent is aware of their ignorance, there will be a specific question that captures the content of their ignorance. Awareness of non-propositional ignorance typically motivates us to ask wh-questions, whereas awareness of propositional ignorance typically motivates us to ask whether-questions. When we ask "is there intelligent life on other planets?," our question can be answered by a simple "yes" or "no," but when we ask "what caused the dinosaurs to become extinct?" it cannot. That is because the content of ignorance in the latter case is captured by a definite description, not a sentence. One may convert their ignorance into knowledge by coming to know a proposition that answers the question, "What caused dinosaurs to become extinct?" If, for instance, we learn that *a meteorite caused the dinosaurs to become extinct* – which is a full proposition – we would thereby eliminate our ignorance. This does not, however, show that our ignorance concerning what caused dinosaurs to become extinct has propositional content. By coming to know a proposition, one may eliminate two (or more) distinct things of which they are ignorant in one go. As things stand, we are not only ignorant of what caused dinosaurs to become extinct, but we are also ignorant of whether it was a meteorite that caused it. The first is non-propositional, but the latter is propositional. This is revealed by the fact that the conditions for the elimination of ignorance in the two cases are different. By coming to know that the proposition, *A meteorite that caused dinosaurs to become extinct*, is true, we would thereby eliminate our ignorance concerning the cause of their extinction; but if we find out that the proposition in question is false, we will no longer be ignorant about whether it was a meteorite that caused dinosaurs to become extinct, but we would still be ignorant about what caused them to become extinct.

The relation between awareness of ignorance and the asking of a question has not attracted much attention. One exception is Peels, who addresses the issue in a brief paragraph:

> One might want to suggest that, next to propositional, practical, and experiential ignorance, there is ignorance of the right answer to a question. As it seems to me, however, this kind of ignorance is reducible to propositional ignorance. Imagine that Sam has put a piece of paper in a box and asks me what is in the box. If I am ignorant of the right answer to his question, I am ignorant of the (truth of the) proposition that there is piece of paper in the box, although I might simultaneously be ignorant of the proposition that there is not a hammer in the box, that there is not a shirt in it, etc., and know that there is not an elephant in the box (the box being far too small for that), etc. Thus, ignorance of the right answer to a question seems to consist of ignorance of two or more propositions, whether one disbelieves them, suspends judgment on them, or has never considered them. (Peels 2010, 2)

First to note here is that ignorance concerning the right answer to a question is not a special type of ignorance; every case of awareness of ignorance can be

captured by a question, unless there is such a thing as ineffable ignorance.[17,18] If I am ignorant as to what is in the box, then my ignorance can be subsumed under what Peels calls experiential ignorance, for I have not experienced what is in the box. Second, this short argument that Peels gives that tries to demonstrate that all such cases can be reduced to propositional ignorance I believe is problematic. The fact that by acquiring the knowledge of a proposition I could eliminate my ignorance does not show that what I mentally represented as being unknown has propositional content. If the true proposition that answers the question "what is in the box?" is one that I have not considered, then it surely cannot be the content of my ignorance of which I am aware. What I represent as being unknown in such a case is captured not by a proposition, but by a singular concept, *the kind of thing that is in the box*.

In another paper, Haas and Vogt argue for the opposite view, although they appear to commit a similar fallacy:

> But while propositional knowledge may be the standard case of knowledge, propositional ignorance seems less evidently 'standard.' Consider the case where Skyler does not know the answer to a fairly open-ended question, such as, 'what is a good way to live for human beings?' ... In thinking about this question, she may need to refine the terms in which she thinks about it, acquire new concepts, learn about empirical research, begin to perceive certain features of situations that are ethically relevant, and so on. Here, it may just not make sense to say that what is absent is knowledge of propositions. (Haas and Vogt 2015, 18)

17 Similarly, Nottelmann (2016) distinguishes between "factual ignorance" (i. e., being ignorant of a fact) and "erotetic ignorance" (being ignorant of the correct answer to a question). This may indeed be a genuine distinction concerning ignorance, but it simply does not apply to awareness of ignorance. Typically, when one is ignorant of a fact, one is not aware of this. As I shall argue later ignorance–that attributions cannot be made in the first-person. I shall also argue that one can know of a fact that it exists but not know which fact it is, or have little acquaintance with it, in which case, one can have fact-ignorance without having whether-ignorance. In all these cases of ignorance, there is always a question that captures the content of what the agent is ignorant of. The important point for now is that being ignorant of the answer to a question is not a special subcategory of awareness of ignorance.

18 For a very interesting argument for the possibility of there being what I have called "ineffable ignorance," see Dasgupta (2015). If it is impossible for me to know where my desk is in Newtonian space (which is one of his examples), then there may be a true proposition that identifies that location that I cannot even entertain. This Dasgupta calls "inexpressible ignorance." He notes that even in such a situation I can become aware of my ignorance as to where my desk is in Newtonian space, which still is expressible (which is a case of non-propositional ignorance). Cases of inexpressible ignorance he gives are always what I label as "whether-ignorance" as a subspecies of propositional ignorance. His argument indicates the importance of not conflating the distinction between propositional and non-propositional ignorance. For a discussion of related issues on unanswerable and unaskable questions, see also İnan (2012), especially *Chapter 12 Limits of Curiosity and its Satisfaction*.

The authors of this passage rightly acknowledge that not every case of ignorance is propositional. However, both the example they give and the conclusion they draw, I believe, make their view susceptible to counterarguments. First, we should ask what is an open-ended question? Is it a question that has no definite answer, or is it a question that has more than one definite answer? Consider the first alternative. Suppose someone who was interested in prime numbers before Euclid asked the question, "What is the largest prime number?," believing prime numbers to be finite. Here, there is no definite answer to that question, but even so, one may still say that what was absent was knowledge of a proposition, namely the one that states that there is no largest prime number. Now consider the second alternative, i. e., the case in which a question has more than one definite answer, for instance, when we ask, "What is an example of prime number between 100 and 200?" Here, once again, it may be argued against the authors that there are propositions whose knowledge is absent for those who ask such a question out of ignorance. The reason why their argument would have little force to convince someone who holds that all cases of ignorance have propositional content is because the authors fail to distinguish between the content of ignorance, on the one hand, and what would eliminate an instance of ignorance, on the other. If all types of ignorance can be eliminated by the acquisition of propositional knowledge, it would follow that when one is ignorant "what is absent is knowledge of propositions." Which way we take an open-ended question here makes no difference. Either way, we may come up with a proposition such that having knowledge of it would eliminate the ignorance of our subject. That would be the case, for instance, if Skyler comes to know that there is no good way to live for human beings, or that she comes to know that, for some X, that X is a good way to live for human beings. Neither proposition, however, can be the content of Skyler's ignorance. For, by expressing her ignorance with this question, she does not thereby express her ignorance about whether there is a good way for human beings to live (which she presupposes to be the case), nor does she express her ignorance concerning a proposition is the form, "X is a good way to live for human beings," for she does not have a suitable phrase which she can substitute for "X," given her ignorance.

4 Two types of ignorance

4.1 Non-propositional ignorance

Awareness of ignorance that does not have propositional content is abundant. One may be ignorant as to who is the shortest spy, why the sky is blue on Earth,

when the next lunar eclipse will take place, where the sun will set on the shore, how a mobile phone works, which parliament has the highest number of females, what is the essence of virtue, and so on. In each and every such case, we can always formulate a linguistic expression, usually in the form of a definite description, whose meaning gives the content of ignorance and whose referent gives its object. What allows us to acquire awareness of our ignorance concerning a specific object is that we can grasp the content of a definite description, but have very little, or even no knowledge of its referent. That is why the object of non-propositional ignorance is never a truth value; it could be a person (motivating a who-question), a cause or a reason (motivating a why-question), a place or a location (motivating a where-question), a time, date, or duration (motivating a when-question), a way, method, or procedure (motivating a how-question), or any other kind of entity that we can refer to (motivating a what-question).[19]

Those who wish to hold that all our mental states have propositional content may object to this. This can be perhaps be done by utilizing a sophisticated version of Millian semantics. Such a theory first claims that there are singular propositions, where an object rather than its representation is a part of the proposition; second, it holds that a singular proposition may have different guises such that an agent may know the proposition under one guise, but not know it under another. We may then claim that every wh-question can be answered by a singular proposition such that that very proposition is grasped by someone (under a certain guise) who is in fact ignorant of the answer (which is a different guise of the very same proposition). If a case can be made for this, then it may appear to follow that the content of ignorance can always be given by a proposition. Such a position can perhaps be extracted from the startling argument due to Stanley and Williamson (2001) which attempts to reduce *know-how* to *know-that*. They argue that for Hannah to come to know how to ride a bike, is for her to come to know a very special singular proposition in the form "w is a way to ride a bike" under a special guise that they call a "practical mode

19 Some have suggested that wh-questions can be analyzed in terms of propositions. On one such account, e. g., Hamblin (1973), a wh-question is taken to be a set of its possible answers, one of which is the true answer. Holmes' question "who is the murderer of Smith?" could then be expressed as a long disjunction in the form "a is the murderer, or b is the murderer, or c is the murderer, etc.," and then we may say that what he wishes to know is which disjunct is the true one. Even if a case can be made for some kind of formal equivalence of the interrogative sentence with this long disjunctive statement, it certainly cannot capture the content of Holmes' ignorance. When Holmes becomes aware of his ignorance concerning who the murderer is, he may be in no position to grasp this long disjunctive statement. For more on this, see İnan (2012), *Chapter 2 Asking and Answering*.

of presentation." It then follows that to know how to do something is simply to know a proposition; and that not knowing how to do something is not to know the proposition in question. Obviously, such a view can then be extended to cover other cases of wh-ignorance. Would it then follow that all cases of awareness of ignorance have propositional content? If Hannah does not know how to ride a bike, she may be taken to be ignorant of a skill; with some reflection, she may then become aware of her ignorance. Can the content of her ignorance be captured by the singular proposition in the form "w is a way to ride a bike"? If so, then she must be in a position to entertain the proposition in her mind. But if w is a special kind of practical mode of presentation such that grasping it would entail that Hannah knows how to ride a bike, then it cannot be the content of her ignorance when she is aware that she does not know how to ride a bike. If, on the other hand, we assume that Hannah can grasp this proposition under a different guise, it still cannot be the content of her ignorance, in the typical way, because she would already know that the proposition is true. All in all, awareness of ignorance concerning a skill is not awareness of ignorance concerning whether a proposition is true or false. This is the case even if know-how can be reduced to know-that.

Going back to Holmes, when he becomes aware of his ignorance as to who murdered Smith, there may be a singular proposition that answers the question, "Who murdered Smith?," which may be said to give the content of his ignorance. If Bill is in fact the murderer, the singular proposition in question would then be *Bill is the murderer of Smith*. Now, intuitively, we may say that Holmes is not in a position to grasp this proposition if he has no prior connection to Bill. But under the Millian view, we are considering if Holmes has sufficient evidence that there is one and only one murderer, then he may be in a position to grasp the singular proposition *Bill is the murderer* under one guise. Suppose that Holmes, apart from being a great detective, has pursued a side career in the philosophy of language, has read *Frege's Puzzle*, Salmon (1986), and was completely persuaded by Salmon's account of Millianisim. As a result of this, we may imagine him having developed the habit of naming the unknown murderer for every homicide case he is assigned to. Suppose in this case he names the murderer of Smith "Murdy." He now could claim that he is in a position to grasp the singular proposition *Murdy is the murderer of Smith*. Now, of course, if he grasps it, he also knows that it is true, as long as he knows that Smith was murdered single-handedly. He could even say: I know the true answer to the question, "Who is the murderer of Smith?"; it is Murdy. It is quite an odd feature of Millianism that we would not have a standard way of expressing our ignorance in such cases. As a Millian, Holmes ought to admit that he does not know, in some sense, who the murderer is. He could claim: "What I am ignorant of, is

not whether Murdy is the murderer, I already know that; rather I wish to know this proposition in some more privileged way by grasping it under another guise which would entail that I know who Murdy is." But then, Holmes could also claim that he knows who Murdy is; he is the murderer of Smith, and once again, he would have to say that he knows who Murdy is under one guise, but not under another. We have had such actual cases in which murderers were named before they were caught. Consider the famous Unabomber case. After several explosives were mailed to certain university and airline offices, the police, being convinced that they all were coming from a single source, coined the name "Unabomber" (shorthand for the "university and airline bomber") to denote an unknown criminal. They were aware of their ignorance as to who was responsible for mailing these bombs. They asked: who mailed these bombs? But in act, they did have an answer, which they knew to be true; it was *the Unabomber who mailed the bombs* … who else? Under the Millian view, this proposition is identical to the proposition that *Kaczynski mailed the bombs*, which implies that the police in fact did grasp this proposition even before they caught the criminal. Does all this imply that the content of their ignorance was propositional? Perhaps so, but then their ignorance cannot be captured by a whether-question. That is because the police in fact knew that the Unabomber mailed the bombs, even before they caught the criminal, and if they knew this, they also knew all along that *Kaczynski mailed the bombs*. Similarly, if Holmes is in a position to grasp the singular proposition that *Bill is the murderer*, under a certain guise, he is not ignorant of whether it is true, given that he would know that it is true, even before he finds out who the murderer is. As we shall see in the next section, one may know a proposition to be true yet not know the fact that makes it true; this is one such case. So, even if Holmes' ignorance could be said to have propositional content, it is not an instance of its typical form that motivates a whether-question. In any case, if we have some respect for the way in which we use language, there must be some intuitive sense in which Holmes simply does not know who the murderer is, and if so, the content of his ignorance is simply not a proposition. Today, we know that the Unabomber is in fact Theodore Kaczynski; the common sense view is that we did not know this earlier (contra to Millianism); anyone interested in him can find out a lot about his life, his character traits, his political views, why he carried out these attacks, etc. This rich file appears to be sufficient for us to claim that we now know who the Unabomber is. Someone who has never heard of him before reading these lines may still find a bit of mystery here. They may even ask, "who is Theodore Kaczynski?" They may take an interest in the issue and search for his name online to find out more about him. This would indicate that they are aware of their ignorance concerning who Theodore Kaczynski is. The more we come to

know about a person, the richer our mental file of that person becomes; how rich it must become so that we no longer consider ourselves as being ignorant of that person depends on many factors: what epistemic standards we set for ourselves, how much interest we have in the topic, what the stakes are within the context we are in. If you set the standards too high, as we occasionally do in philosophy, you may even find yourself asking yourself the question, "Who am I?"[20] That is why ignorance is not an all-or-nothing affair; it comes in degrees. It is rarely the case that ignorance can be fully eliminated, no matter how rich your mental file is about a person or an object, there will always be more for you to learn. The only exception to this is when the object of our ignorance is an entity of which we can have complete knowledge, which is rarely or perhaps never the case. Awareness of ignorance, therefore, is not something we should always expect to be fully eliminated.[21] This account makes ignorance a gradable notion that is context-sensitive and interest-relative. Perhaps that is what led philosophers to concentrate on ignorance that has propositional content and neglect non-propositional ignorance. This is based on the assumption that propositional knowledge is not a gradable notion, that is, it does not come in degrees; and even if knowledge attributions are context-sensitive, this is not as worrisome as the context-sensitivity of know-wh attributions. This, I believe, rests on a mistake: because propositional ignorance is not always about truth, an agent who knows that a proposition is true can still remain ignorant about other aspects of that proposition.

4.2 Propositional ignorance

There are various things regarding which one may be said to be ignorant in connection with any specific proposition. First, one may be ignorant of a proposition, period, if one has never entertained that proposition; this could happen if one has the conceptual apparatus to grasp the proposition in question, but has never done so, or instead, it may be that the person is not able to

20 The idea that whether we consider ourselves as knowing something or as being ignorant of it depends on various contextual factors follows from the doctrine that is typically called "Epistemic Contextualism." In his recent paper, Blome-Tillman (2016) discusses this in length but only considers what I have called "propositional ignorance." I should note that, on my view, epistemic contextualism applies not just to propositional knowledge but to objectual knowledge as well, and thus, it also applies to cases of non-propositional ignorance. See İnan (2012), *Chapter 10 Relativity of Curiosity and its Satisfaction*, for a detailed discussion of this.

21 For a discusion of how degree of ignorance relates to degrees of belief, acquiantance, knowledge, interest and curiosity see Inan (2014).

grasp the proposition due to limitations of their idiolect. Ignorance of a proposition in this sense is not something of which the subject who is ignorant is aware. Such ignorance attributions will always have to be in the third-person, as, for instance, when we say that Socrates was ignorant of the proposition that the Higgs boson is an elementary particle. Setting aside this kind of ignorance, let us concentrate on cases in which an agent in fact grasps a proposition.

For an agent *S* and a proposition *p* that *S* grasps, there are three different ignorance attributions we can make:

S is ignorant whether *p* (call this "whether-ignorance"),
S is ignorant that *p* (call this "that-ignorance"),
S is ignorant of the fact that makes *p* true (call this "fact-ignorance).

Suppose Sue does not know whether the Higgs boson is an elementary particle, but unlike Socrates, she grasps the proposition in question. She can then become aware of her ignorance by a bit of self-reflection and then state her ignorance by uttering: "I am ignorant as to whether the Higgs boson is an elementary particle." Here, what she is ignorant of is whether the proposition in question is true or false, and the object of her ignorance then can be captured by a definite description: the truth value of the proposition that *the Higgs boson is an elementary particle*. The object of ignorance in such a case is a truth value, and the content of ignorance contains a proposition. This holds for any instance of whether-ignorance. As simple as it sounds, it gives rise to various philosophical questions: What is a truth-value? Is it a peculiar object that is the referent of a sentence, as Frege suggested? Or is it merely a property of a proposition? If so, what kind of property is it? Is it a genuine property concerning whether the proposition corresponds to reality? How then can a mathematical proposition or a normative one be true? Are there different realms for which we have different kinds of truth? Or is truth a deflationary property? These are some of the controversial questions that have been raised about the notion of truth, which have given rise to an enormous philosophical literature. The question as to what is the unknown that we represent when we express our awareness of ignorance concerning whether a proposition is true or false does not have any straightforward answer to everyone's liking. For each and every distinct theory of truth, we could get a different object of awareness of ignorance. If we take the oldest, the most popular and perhaps the most intuitive theory of truth, namely the correspondence theory, which, on its most popular version, a proposition is true just in case it corresponds to a fact, and false otherwise, it would follow that being ignorant of whether a proposition is true, is not knowing whether that proposition does or does not correspond to a fact. In what follows I will assume that this theory is correct at least for some simple truths, but I will not presuppose that facts are entities completely independent of our conceptual schemes.

Consider now Io, who, unlike Sue, knows that the Higgs boson is an elementary particle. If Io knows that Sue does not know that the Higgs boson is an elementary particle, then he may correctly say "Sue is ignorant that the Higgs boson is an elementary particle." This is a case of that-ignorance. (It is a rare construction in the English language, so much so that it may sound ungrammatical to some ears.) The distinction between whether-ignorance and that-ignorance may initially appear uninteresting. This is because one may think that whether-ignorance can be reduced to that-ignorance, i. e., a subject's ignorance whether p, may be taken to be the subject's being ignorant that p, and being ignorant that non-p. This may not be correct, if attribution of that-ignorance is factive, that is if an assertion in the form *S* is ignorant that *p*, entails *p*. If it does, then it would follow, first, that whether-ignorance cannot be reduced to that-ignorance, and second, that that-ignorance attributions cannot be made in the first person. Rik Peels appears to commit himself to the view that that-ignorance is factive: "First, we would not say that someone who believes a false proposition *p* and, thereby, lacks knowledge of *p*, is ignorant of *p*. One can only be ignorant of truth, so it seems" (Peels 2010, p. 4).[22] Now what would appear to support this position is that a statement such as "people in the old days were ignorant that the earth is round" seems fine, although "people in the old days were ignorant that the earth is flat" appears to be very awkward. The reason why the latter statement sounds awkward may be because it simply expresses a falsity. If so, then it appears that in order for us to attribute that-ignorance to others, we would have to know that the proposition is true. This may appear to be problematic. Consider Peter Unger (1975) who has argued for "universal ignorance," the view that no one ever knows anything to be so. If what he says is correct, then it follows that Unger himself does not know anything. But, if that-ignorance is factive, would it then follow that Unger is contradicting himself by asserting the doctrine of universal ignorance? It would seem so if we tried to paraphrase this doctrine in term of that-ignorance. Unger cannot single out a proposition, such as the proposition that the Earth is round, and then assert that everyone is ignorant that the earth is round, for in order for him to assert it, he would have to know that it is true, which contradicts his statement. The best he could then do is quantify over true propositions and claim that for every such proposition *p*, everyone is ignorant that *p*, although he cannot instantiate it to any particular proposition. There may be problems here concerning whether one is justified in asserting a universal claim, while not being able to assert an instance of it. In any case, this is where whether-

22 K. Fine (2018) appears to presuppose that that-ignorance in not factive as he says that "one is (first-order) *ignorant whether p* if one is both ignorant that *p* and ignorant that not-*p*."

ignorance comes to the rescue, since it is not a factive notion. There may be no contradiction for Unger to assert that for every proposition *p*, everyone is ignorant whether *p* (although under the knowledge-account of assertion he would be violating a linguistic norm.) This time he can give many instances as examples. That-ignorance does appear to have a use in which it is factive; whether this is the case for all of its uses I shall leave open. If it is, then it may also follow that that-ignorance can never be used in the first-person: A statement in the form "I am ignorant that *p*," would be another Moore-type of case, in which I imply, not only that I do not know that *p*, but also that *p* is true. First-person attributions of that-ignorance would then be unassertable; although not because they would express falsities, but rather because they would violate certain norms of assertion. If that-ignorance is factive, then it also follows that we cannot attribute that-ignorance to an agent when the proposition in question is in fact false. This is the case both for first- and third-person attributions. I cannot say "I am ignorant that the Earth is flat," nor can we say that Sue is ignorant that the Higgs boson is *not* an elementary particle (assuming that the Higgs boson is an elementary particle). When Sue is ignorant whether the Higgs boson is an elementary particle, it would then follow that Sue herself cannot attribute that-ignorance to herself; that is, she cannot assert the sentence "I am ignorant that the Higgs boson is an elementary particle," although it is true. The best she can say is "I am either ignorant that the Higgs boson is an elementary particle, or I am ignorant that it is not, but I do not know which." That-ignorance constructions would then be useful for us to attribute ignorance to others, but not to ourselves. This would be one way in which we may become aware of the ignorance of others which bears on what cognitive scientists call a "theory of mind." As Peels notes, such ignorance attributions also show that the standard view which identifies ignorance with lack of knowledge cannot be universally correct.[23] These are some of the interesting philosophical issues concerning propositional ignorance. There is, however, a question, which I believe deserves much more attention than any of the foregoing ones and is by far more significant philosophically. Is a subject's ignorance regarding a proposition completely

23 I agree with Peels that knowing that you do not know a proposition that is false (because you know that it is false) is not a case of ignorance. What is a more controversial case is when you have a belief that is not knowledge; Peels (2010) argues that you cannot be said to be ignorant in such a case, which motivates him to define ignorance not as lack of knowledge but rather as lack of belief. LeMorvan (2011) disagrees. See Le Morvan and Peels (2016) for a good summary of the arguments for both positions. I will not take a stance on this controversy in this paper. Once we make the distinction between whether-ignorance and fact-ignorance, it will follow that even if Peels is right that one cannot be said to be ignorant whether *p* when one believes that *p*, one may still be ignorant of the fact that makes *p* true.

eliminated when the subject comes to know whether the proposition is true? I will argue that not every instance of awareness of ignorance that has propositional content is about truth, i. e., a subject's ignorance concerning a proposition may not be fully eliminated even when they come to know that it is true. To see this, consider now the distinction between whether-ignorance and fact-ignorance.

When one is ignorant about whether a proposition is true or false and then finds out that the proposition is true, we would normally say that their ignorance has now been eliminated. This does eliminate their whether-ignorance, but I wish to argue it does not always eliminate another type of ignorance with respect to the very same proposition. In order to show this, I shall presuppose a minimal amount of realism with respect to the notion of *truth*, and the ontology of facts as truth-makers. For a simple singular proposition in the subject/predicate form, I will presuppose that such a proposition is true if and only if there is a particular fact that makes it true. I will set aside the well-known problems concerning whether such an account can be generalized to all truths.

Consider a proposition expressed by a sentence *s* in the form "*a* is *F*," where *a* is a singular term that refers to an object and *F* refers to a property. For an agent *S*, who grasps the proposition expressed by sentence *s*, we may raise three distinct questions concerning the agent's epistemic situation with regard to that sentence and its parts.

Does *S* know whether "*a* is *F*" expresses a truth?
What is *S*'s epistemic connection to the referent of *a*?
What is *S*'s epistemic connection to the referent of *F*?

These three questions are different; an answer to one does not provide an answer to the other two. This does not imply that the three questions are completely independent; that is, an answer to one of the questions may at least suffice to narrow the range of possible answers to the other two. First, consider the case when the answer to the first question is negative. This is the situation when *S* grasps proposition *p* through sentence *s* ("*a* is *F*"), and *S* does not know whether *p*. Does this tell us anything about the answers to the other two questions? It may be said that given that *S* grasps the proposition through sentence *s*, then *S* must have some epistemic connection to the referents of *a* and *F*. Putting aside the predicate term *F* for a moment, let us consider the subject term *a* of the sentence. *S* grasps the term *a*; in other words, *S* knows the meaning of the term *a*. Does that give us any information concerning *S*'s knowledge of the referent of *a*? One may be tempted to think that given that *S* grasps the proposition, *S* must have some close epistemic connection to the referent of the subject term of the sentence, but we have seen earlier that this is not always

the case. Suppose Sue grasps the proposition expressed by "the Earth naturally contains iridium," but she does not know whether it is true. Her epistemic connection to its subject term is quite close; she knows a lot about the planet on which she lives. Now consider the sentence "the 98th prime number is larger than 500." Sue easily grasps this sentence too but suppose again she does not know whether it expresses a truth. That would be the case, for instance, if Sue does not know what the 98th prime number is. What is her epistemic connection to its referent? How much knowledge does she have concerning the 98th prime number? Well, if she knows that prime numbers are infinite and well-ordered, then she can claim to know that she knows that the term "the 98th prime number" has a referent. She then has existential knowledge. She can also use her background knowledge of prime numbers to make some deductions and say for instance "I know that 98th prime number is not divisible by any number other than itself and 1." She can trivially produce many such propositions all of which she would know to be true. No matter how many such propositions she produces as such, that would not change the fact she does not know what the 98th prime number is, until she calculates it, or looks it up. Consider now the sentence "the closest planet to Earth on which there is intelligent life has an atmosphere." Once again, suppose that Sue grasps what the sentence says but does not know the proposition expressed by it. The reason why she does not know it may not be because she does not know whether a planet sustaining intelligent life must have an atmosphere. We may even assume that every planet that sustains intelligent life must have an atmosphere, and that Sue knows this. The reason why Sue does not know this proposition is because she does not even know whether there is such a planet, that is, she does not even know whether the subject term of her sentence does have a referent. Although Sue grasps the meaning of the subject term of the sentence "the closest planet to Earth on which there is intelligent life" she knows nothing about its referent. All in all, when an agent does not know a proposition they grasp through a sentence, we could have cases in which the agent (a) has a very close epistemic connection to the referent of the subject term of the sentence, (b) has a very remote epistemic connection to the referent of the subject term of the sentence, or (c) knows nothing about the referent of the subject term of the sentence. This shows that answering the first question negatively says little about what the answer to the second question is.

Now let us consider cases when the answer to the first question is positive, that is, when our agent grasps proposition p through sentence s, and S knows that p. What could that tell us about S's epistemic connection to the referents of the parts of the sentence s? Let us first start with a case in which the subject has close epistemic connections. Sue grasps and knows the proposition expressed by

the sentence "the Earth contains liquid water." Like any normal adult, Sue has very rich mental files both of the Earth and of water and the *containing* relation. She knows a lot about the referent of both the subject term of the sentence and its predicate. Now consider the sentence "the Higgs boson is an elementary particle." Suppose Sue has read this in some reliable physics journal that she trusts. If it is true that the Higgs boson is an elementary particle, then Sue knows this. Her knowledge is an instance of knowledge by testimony. How much does Sue know about the referents of the parts of this sentence? Unlike the previous cases, it may be said that this time Sue must have some partial knowledge of the referents of the parts of this sentence, given that she knows the proposition it expresses. Concerning the Higgs boson, for instance, Sue must at least know that it exists, and perhaps a bit more than that. After all, it would sound very awkward for Sue to say "I know that the Higgs boson is an elementary particle, but I do not know whether the Higgs boson exists"; and it may also sound awkward for her to say "I know that the Higgs boson is an elementary particle, but I know nothing about the Higgs boson." The reason why such assertions sound awkward may be because they always express falsities, and the reason that they express falsities is because a knowledge attribution in the form "*S* knows that *a* is *F*," entails a proposition in the form "*S* knows that *a* exists, and has at least some partial knowledge of *a*." If so, in order for Sue to come to know that the Higgs boson is an elementary particle, she must not only know that the Higgs boson exists, but she must also have some partial knowledge of it. How much must she know? What is the minimum amount of knowledge that she must possess about the Higgs boson for her to know the proposition in question? This is not an easy question to answer, and it is not even clear that the question has a definite answer. How much world knowledge one must have in order to have word knowledge is one of the most challenging questions in the philosophy of language. For Sue to grasp the term "the Higgs boson," she must have a mental file of it which contains some information; not all of such information has to be accurate, but some of it must be accurate in order for the file to be a file *of* the Higgs boson. Now we may wish to distinguish this accurate information into two parts; the part required for the mental file to be a file of its referent, and the remaining part which is added later. The former is what we may call a "file-opener." This is what is required for an agent to fix the referent of the term in question and is also what is required for the agent to grasp the meaning of that term. When we ask Sue what she knows about the Higgs boson, the answer she gives will be retrieved from her mental file of the Higgs boson. Not everything she says in answer to our question must be from the file-opener part. For instance, she may say that the Higgs boson is what gives mass to some particles. This may be from the file-opener part, for she may have opened up her file by

learning that this property was what was used by Higgs and others to fix the reference of the term. Upon learning that a gap in the Standard Model was the lack of an explanation concerning why some particles have mass, Sue knows that the term was coined as a term to denote a kind of particle that would enable physicists to fill this gap. If so, Sue initially may have opened up her file by the reference fixing description "the particle which gives mass to other particles." She may have later learned that the Higgs boson is the particle associated with the Higgs field. This may be information she acquired that is not part of the file-opener, assuming that she did not initially need it to grasp the term. Some may say that if one has never heard of the Higgs field, then one is not in a position to grasp the term "Higgs boson." If so, we may wish to add this to the file-opener part of Sue's mental file. There may be no precise criteria that determine when an agent acquires a new concept or comes to know the meaning of a term in their idiolect. What is important for my purpose here is not whether there are such precise criteria. It may very well be that the transition from a state of ignorance concerning the meaning of a term to a state of having acquired the knowledge of the meaning of the term has no sharp boundaries, allowing for intermediate states that are indeterminate. If this is correct, and I believe it is, there comes a point when we pass some threshold such that we acquire the knowledge of the meaning of a term sufficient for us to use it to express our beliefs, our knowledge, and our ignorance. The point is that once we pass this threshold, our knowledge of the referent of that term may still allow us to express our ignorance of it. When Sue passes the threshold concerning her knowledge of the meaning of the term "Higgs boson," her knowledge of this entity may still not be much. She may still have a very high degree of ignorance about the Higgs boson. Although she knows that the Higgs boson is an elementary particle, she may still be curious about the Higgs boson and wish to inquire into it so as to learn more about it. Consider now the referent of the predicate part of our original sentence. Sue grasps the concept of an *elementary particle*. Suppose that when we ask her, "Is an elementary particle an indivisible entity that constitutes physical reality?" Sue hedges, and admits that she does not know the answer. Upon some self-reflection, Sue then may come to realize that there is plenty more for her to learn not just about the Higgs boson, but also about an elementary particle. Now consider the sentence as a whole: "the Higgs boson is an elementary particle." If true, it is made true by a fact, namely the fact of *the Higgs boson's being an elementary particle*. If Sue can express her ignorance concerning the parts of the sentence, then she can express her ignorance concerning this fact. Although she knows that the proposition is true, she is still ignorant (to some degree) of the fact that makes it true. By coming to know that a proposition is true, we eliminate our whether-ignorance,

but that does not always put us in close epistemic contact with the fact that makes that proposition true. If Sue is an open-minded self-reflective epistemic agent, she may say "I know that the Higgs boson is an elementary particle, but I am quite ignorant of the fact that makes it true." Knowing that the proposition is true is merely knowing that such a fact exists. At times, one may perhaps even come to know with *complete certainty* that a proposition is true, yet not know the fact that makes it true. You may know with complete certainty that the 98th prime number is not divisible by 3, but that does not imply that you know what makes it true, if you do not know what is the 98th prime number. Holmes may come to know that the murderer of Smith is insane, without knowing the fact that makes it true, if he does not know who the murderer is. If you are ignorant as to what is the color of the sky on Venus on a sunny day, and I tell you that it is Solange Knowles's favorite color, you could then come to know the proposition that *the color of the sky on Venus on a sunny day is Solange Knowles's favorite color*, if you take my word for it, although you would not know the fact that makes that proposition true if you do not know what Solange Knowles's favorite color is.[24] Then when you learn what color that is, that may still not imply that you have no ignorance left concerning this fact. Just like our ignorance concerning who someone is, what something is, why and when and where and how something happened, etc., our ignorance concerning a fact that makes a proposition true is also a state that comes in degrees and can rarely (perhaps never) be fully eliminated, since we rarely (perhaps never) have full acquaintance with a fact.

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5 A recap

I left open the question whether awareness of ignorance is a kind of mental state. It may turn out that becoming aware of the ignorance of others has externalist conditions, and is not a mental state, whereas becoming aware of one's own ignorance does not have externalist conditions, thus making it a

24 Our standard knowledge attributions in the form *S knows that p* are not sensitive to this distinction. Two subjects may know the very same proposition, but one may be ignorant (or have a high degree of ignorance) of the fact that makes it true, whereas the other may not. I have argued in earlier work that this suggests an important distinction between two kinds of propositional knowledge that I labeled as "ostensible" versus "inostensible." For a more precise formulation, see İnan (2012), *Chapter 3 Knowledge by Acquaintance and Knowledge by Description*, and for a more elaborate discussion, see İnan (2018).

mental state. For an agent to become aware of their own ignorance, they need the capacity to form a mental representation of something *as* being unknown to them. Such forms of mental representation are enabled by merging representations whose objects are known together to form a new complex representation whose object is unknown. I also left open the question whether beings who do not possess a fully developed language do have such a capacity; if it turns out that images can be merged to form a complex image of something unknown, then it may be possible for some non-human animals and pre-lingual children to represent unknowns. However, by itself, that would not suffice for them to become aware of their ignorance because *awareness of ignorance* requires an agent to represent the unknown *as* an unknown, which requires possessing some epistemic concept, such as knowledge, as well as having the capacity to engage in higher-order epistemic representation. This is why awareness of ignorance is a very peculiar type of meta-representation, since it requires representing a representation as determining (specifying) an object that is unknown. It is doubtful that a being who lacks language can have such a mental skill, but I leave this too as an open question. It may turn out that early *Homo sapiens*, and perhaps also our close relatives such as the Neanderthals and the Denisovians had such a mental skill, although not fully developed, but even if so, the scope of their awareness of ignorance would have had to be extremely limited compared to us. Once we developed a full-fledged language that is compositional and recursive, there emerged an enormously rich pool of concepts that could be merged in infinitely many ways to form novel concepts that allow us to represent an unlimited number of unknowns. The fundamental linguistic form by which we are able to form such a representation is what Russell called a "definite description." Although we owe much to Russell for recognizing the epistemic and semantic significance of definite descriptions, unfortunately, he had little interest in how the use of definite descriptions relates to our capacity to become aware of our own ignorance. We also owe much to Frege for constructing the most elaborate semantic theory based on his distinction between the meaning of a term and its referent, but it simply did not occur to him that one can grasp the meaning of a term without having any knowledge of its referent. Knowledge of meanings does not automatically give us knowledge of referents; this feature of language allows us to construct a term whose meaning is known to us and to represent mentally an unknown object that is the referent of that term. Thanks to Frege, we can distinguish between the content of ignorance, which can be identified with the meaning of a linguistic term, and the object of ignorance, which can be identified with the referent of the term. It is vital to realize that our ability to ask questions is based on our mental capacity to represent unknowns. What

allowed us to construct the linguistic form of an interrogative sentence is our ability to become aware of our ignorance, be curious, and our need to share this with our fellow human beings. The primary function of an interrogative sentence is to enable us to ask questions, to express our curiosity, and so to imply our ignorance. Cognitive scientists have emphasized the significance of our ability to join our attention on one particular object, what is usually called "joint attention"; yet they have neglected that our capacity for joint attention is not always directed at what is experienced and known. Shared awareness of ignorance is another type of joint attention directed toward an unknown. This spawned the sciences and philosophy; it allows us to cooperate to answer questions that express our common ignorance. If two people are ignorant of the same thing, and both are aware, not only of their own ignorance, but the ignorance of the other as well, then we would have a case of what might be called "joint-ignorance," which I believe is a special and very important instance of joint attention. Whether it is individual or joint, awareness of ignorance is always directed toward an unknown entity, making it an intentional state; and it is always intensional, since it has conceptual content that determines, refers to, and represents the object of ignorance. By extending our language, we acquire new complex concepts whose referents are unknown to us, which in effect expands our awareness of ignorance and motivates us to ask novel questions. I have argued that awareness of ignorance has two types, (a) non-propositional ignorance, where the content of ignorance is not a proposition but a singular or a general concept, and the object of ignorance is its referent; (b) propositional ignorance whose content contains a full proposition which has three sub-types: that-ignorance, which may be factive, and if so, can only be ascribed to others – which is useful for a theory of mind, but not for one to become aware of their own ignorance; whether-ignorance, which can be ascribed to others as well as to oneself, whose content can be captured by a definite description in the form "the truth value of *p*," which makes the object of ignorance the actual truth value of the proposition; and fact-ignorance, in which the content of ignorance is again a proposition, but the object of ignorance is not a truth value, but rather the fact that makes the proposition true. I have argued that one can know that a proposition is true, but still be ignorant about the fact that makes it true. Assuming that one cannot have full acquaintance with an object or a fact (except perhaps for some primitive phenomenal states), it should follow that there is always a degree of ignorance contained in everything we claim to know.

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