

Vague Perception

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Abstract: I argue that some perceptual experiences are vague. To do so, I identify a characteristic feature of vagueness and show that some perceptual experiences have this feature. These include blurry experiences, experiences of color under low lighting, and experiences of number, as in the case of the speckled hen. The conclusion that these experiences are vague has two noteworthy consequences. First, it presses us to see whether and how existing theories of vagueness can be extended to perceptual experience. Second, it sheds light on several puzzles in the philosophy of perception.

I believe that some perceptual experiences are vague. That is, they are vague in the same way that sentences like ‘Harry is bald’ are vague. Call this thesis *Vague Perception*.

Though others have discussed ways in which vagueness and perception might connect, *Vague Perception* has yet to receive systematic treatment. My goal in this paper is threefold. First, I will distinguish *Vague Perception* from other claims in the neighborhood (§1). Second, I will defend *Vague Perception*. In doing so, I will show how we can identify vague perceptual experiences without committing to any theory of vagueness or of perceptual content. A wide class of perceptual experiences will turn out to be vague (§2). Third, I will show how recognizing this class of experiences as vague may have fruitful consequences, both for the study of vagueness and for the study of perceptual experience (§3).

Here is an example to introduce linguistic and perceptual vagueness:

A Tale of Two Kitties. One day, a friend tells you he’s adopted an ocat—a spotted cat—named Venus. “How many spots does Venus have?”, you ask. “Venus has about fifty spots”, he replies. In fact, Venus has thirty-two spots.

The following week, another friend tells you she’s adopted an ocat named Milo. At her house, you catch a glimpse of Milo, sitting in a dark corner. Milo appears to you to have about fifty spots. In fact, he has thirty-two spots.

The first half of the tale concerns vague language. It features the vague sentence ‘Venus has about fifty spots’. A note on terminology: I will say that this sentence is *vague* no matter how many spots Venus has. Given that she has thirty-two spots, the sentence is also *borderline*. (Another way to say this: thirty-two is a borderline case of the predicate ‘about fifty’. I will generally talk about vague sentences rather than vague predicates, for reasons that will become clear.)

As I will argue, the second half of the tale concerns a vague perceptual experience. Since Milo has thirty-two spots, the experience is also borderline. (Low lighting can make a display of spots appear more numerous than it actually is.)¹ My argument won’t depend on exactly how number properties are represented in perceptual experience. Nor will it depend on whether ‘about fifty’ is the best way to *describe* how many spots Milo appears to you to have. The vagueness is, I believe, a feature of the experience itself.

I will argue for *Vague Perception* in two steps. First, I will identify an epistemic property that characterizes borderline sentences. Regardless of whether borderlineness is fundamentally epistemic, we can use this property to pick out borderlineness as a phenomenon of interest. Second, I will

¹ Cohen Kadosh and Henik (2006) report this effect for a display of numerals; Clarke and Beck (2021) suggest it would extend to a display of spots (p. 2).

show that some perceptual experiences can have this property, and so can be borderline. An experience that can be borderline is vague. The sorts of experiences I'll discuss include blurry experiences, experiences of color under low lighting, and experiences of number (as in the case of Milo, a version of the case of the speckled hen). Vague predicates are sometimes metaphorically described as having blurry boundaries²—but I intend to argue that blurry boundaries are quite literally vague.

Vague Perception is important for two reasons. First, if it is right, any complete theory of vagueness will need to accommodate vague perceptual experiences. Second, the kinds of perceptual experiences I'll be discussing give rise to several problems in the philosophy of perception. Recognizing these as problems *of vagueness* will help. It will allow us to bring the toolkit of vagueness to bear on solving them.

This paper will remain neutral with respect to competing theories of vagueness beyond whatever follows from *Vague Perception* itself. My goal is not to advance any specific proposal about what perceptual vagueness consists in (though I will discuss some options in §3), but rather to show that, whatever is going on with vague sentences, we have reason to think the same thing is going on with certain perceptual experiences.

I will also remain neutral with respect to the metaphysics of perceptual experiences, with one exception: I will assume that perceptual experiences can be accurate.³ I will also sometimes talk as

² See, for example, Williamson (1994, p. 36), Keefe (2000, p. 7), and Smith (2008, pp. 1–2).

³ Although I will assume it, I do not take it to be a necessary condition for vagueness. By comparison, moral vagueness might be compatible with the non-cognitivist view that moral sentences don't have accuracy-conditions.

though perceptual experiences have representational content, but, to the extent this outruns the assumption that they can be accurate, it's not necessary for my argument. I will show that we can identify vague experiences without first knowing anything in particular about perceptual content.

1. Background

It will be helpful to distinguish *Vague Perception* from a different claim, one which has attracted a number of defenders. That claim is

Determinable Perception. Some perceptual experiences represent (or somehow involve⁴) determinable properties, without representing (or involving) full determinations thereof.

Some terminology: an example of a *determinable* property is the property of being from zero to one hundred in number. *Determinations* of this property include the property of being from forty to sixty in number and the property of being fifty in number. The latter is *fully determinate*. All of these properties are *precise*, by which I mean not vague. Determinability is not vagueness.⁵ (If there are vague properties, then there are also vague determinable properties and vague determinations. For

⁴ For example, if an act-object theory of perception is true, in the object of the experience. Of course, it's hard to see how an object could have a determinable property without having any full determination thereof. For this reason, Price (1941) takes *Determinable Perception* to be inconsistent with the sense-datum theory (pp. 285–286), and Armstrong (1968) takes it to tell against the existence of mental qualities (pp. 219–221).

⁵ Block (2015, p. 4) notes this distinction in the perceptual setting, using 'intervalic' to mean determinable.

example, the property of being about fifty in number, if such there be, is both determinable and a determination of the property of being from zero to one hundred in number.)

I won't use the term 'indeterminate'. In the philosophical literature, 'indeterminate' sometimes means determinable, sometimes means borderline, sometimes means neither true nor false, and sometimes refers to some other purported property of borderline cases. I will avoid it to avoid confusion.

Russell (1923) might seem to endorse *Vague Perception*. Russell writes: "Vagueness . . . is a conception applicable to every kind of representation—for example, a photograph, or a barograph . . . words, perceptions, thoughts" (pp. 89–90). But Russell conflates vagueness with determinability, and here he appears to be discussing determinability. He gives, as an example of the phenomenon in which he's interested, "a photograph which is so smudged that it might equally represent Brown or Jones or Robinson" (p. 89).⁶ It's clear that he endorses *Determinable Perception*. It's not clear whether he endorses *Vague Perception*, and his argument does not seem to entail it.

Others have supported *Determinable Perception* on the basis of the case of the speckled hen—or, as I have rendered it, the case of the spotted cat. As things seem to you, there is no fully determinate number n such that Milo appears to you to have n speckles. For this reason, Chisholm (1942), Armstrong (1968, pp. 219–220), and Munton (2021, pp. 643–647) take the experience of the speckled hen to witness *Determinable Perception*. Blurry experiences are similar in a relevant respect: when you see a shape blurrily, there's no fully determinate location the shape appears to occupy. For

⁶ He might also conflate vagueness with ambiguity: a vague word, says Russell, is one with multiple meanings.

this reason, Tye (2002, pp. 147–149) and Nanay (2018, pp. 256–257) take blurry experiences to witness *Determinable Perception*.⁷

Chisholm (1942), the locus classicus of the speckled hen, discusses not just determinability, but also vagueness. Chisholm assumes that certain propositions, “basic propositions”, refer only to one’s own experiences and so can be known with certainty. Chisholm uses the case of the speckled hen to argue that basic propositions are vague. For example, the basic proposition referring to your experience of Milo might be that Milo has many spots, or that Milo has about fifty spots (p. 273). In other words, for Chisholm, the *epistemic deliverance* of any perceptual experience is a vague proposition. But this is not yet *Vague Perception*, which says that some perceptual experiences themselves are vague.

Bacon (2018) also argues that the epistemic deliverance of a perceptual experience can be a vague proposition (pp. 106–109). It will be worth reconstructing Bacon’s argument, as I will refer to it later. Consider the possible fully determinate outcomes regarding the number of spots Milo might have. He might have fifty spots, or forty-nine, or Assume you assign equal prior credence to each of these possibilities. And suppose, for *reductio*, that the total evidence provided by your experience is a precise proposition. Then there must be some numbers z and w (possibly $z = w$) such that your evidence is the precise proposition that Milo has between z and w spots. The rational response to the experience is to update your credences by Bayesian conditioning on this evidence. This will yield equal posterior credence in each proposition of the form *Milo has i spots*, for all i between z and w . But this seems wrong. Intuitively, you should assign credences to these possibilities in something like a bell curve. You should have some credence that Milo has fifty spots, some lower

⁷ Stazicker (2018) gives a different argument for *Determinable Perception*.

credence he has forty-nine, some still lower credence he has forty-eight, and so on (likewise fifty-one, fifty-two, ...).⁸ From the *reductio*, it follows that the evidence provided by your experience of Milo is not a precise proposition. So, Bacon concludes, it must be a vague proposition.

I should note that, while neither Chisholm nor Bacon go so far as to endorse *Vague Perception*, their views do suggest an argument for that further thesis. First premise: as Chisholm and Bacon hold, the epistemic deliverance of your experience of Milo is a vague proposition. Second premise: an experience's epistemic deliverance is its content.⁹ Conclusion: your experience has vague content. That makes it a vague experience. By comparison, on Bacon's view, the sentence 'Venus has about fifty spots' has vague content, and that makes it a vague sentence. This argument may be promising, but it turns on controversial assumptions about perceptual epistemology that my argument for *Vague Perception* will not require. (Indeed, Beck and Langedoc (2023) suggest an objection to it, which I'll discuss in §3.2.)¹⁰

Perkins and Bayne (2013) argue for a different claim in the neighborhood of *Vague Perception*. They argue that some perceptual *representations* are vague. A representationalist, who thinks that a perceptual experience just is a perceptual representation, might take this claim to entail *Vague*

⁸ Dorr (2003) also makes this point. But he draws a different lesson from it: he concludes that vagueness is a matter of linguistic convention. This is one view about vagueness that won't translate easily to perceptual experience.

⁹ Munton defends a premise similar to this one (2016, pp. 306–307), which I'll discuss in §3.2.

¹⁰ I can also imagine the following objection: since the concept of evidence is normatively laden, the argument moves from normative premises to a non-normative conclusion. One might doubt whether that's an acceptable way to learn non-normative facts.

Perception. Perkins and Bayne are not representationalists. On the contrary, they make this claim in the service of an objection to representationalism, and so do not themselves endorse *Vague Perception*. But the details of their objection to representationalism need not concern us here; we can isolate their argument that some perceptual representations are vague from its broader context.¹¹ The argument goes, schematically, as follows. Premise: in the *Tale of Two Kitties*, it's borderline whether your perceptual representation of Milo is accurate. Conclusion: your perceptual representation of Milo is borderline.¹²

I am sympathetic to this argument. But I think it is less than fully satisfactory, for two reasons. First, in order to use the argument to show that a perceptual representation is vague, we first need to show that something else is vague: the claim that the representation is accurate. Plausibly, though, we can identify vagueness in a sentence *S* without first identifying vagueness in a claim about *S*'s accuracy. (Otherwise, the task of identifying vagueness would throw us into an

¹¹ I believe the representationalist can accept this argument without undermining her representationalism, because Perkins and Bayne's objection to representationalism is unsound. The objection equivocates between using ∇ and Δ , the borderlineness and definiteness operators, as operators on sentences vs. as operators on propositions. Perkins and Bayne deny that there are vague properties, or, I take it, vague propositions. So they ought to use ∇ and Δ as operators on sentences. But their objection to representationalism relies on substituting properties, rather than predicates, within the scope of ∇ and Δ . Such substitutions require that ∇ and Δ be operators on propositions.

¹² Pp. 80–81. Perkins and Bayne's example concerns color rather than of number, but the idea is the same.

infinite regress.) If we can do the same with a perceptual experience, that would strengthen the claim that the experience itself is vague. My argument will show that we can.

Second, Perkins and Bayne rely on an implicit premise: if it's borderline whether x is accurate, then x *itself* is borderline. But Perkins and Bayne do not defend this premise. And their own account of vague language shows why it needs defending. On their account, it's borderline whether Fx just in case there are multiple properties that are suitable to be referents of 'F' and x instantiates only some of these properties. It follows from this account that, if it's borderline whether your experience of Milo is accurate, then there are multiple properties that are suitable to be referents of 'accurate' and your experience instantiates only some of these properties. So far, this looks like just vagueness in language. More needs to be said to motivate the conclusion that the experience itself is borderline.

That said, Perkins and Bayne make an interesting suggestion about what it is to have a vague perceptual representation. They suggest, by analogy to their account of vague language, that a perceptual representation is vague just in case multiple precise properties are suitable candidates to figure in its content. I'll return to this suggestion in §3.1.

Vague Perception can also be distinguished from two other claims that connect vagueness and perception. One is the claim that it can be vague what the content of a perceptual experience is. For example, if, in general, the content of an experience is the property that it functions to track, the vagueness in 'function' may make it vague what the content of the experience is.¹³ But this is not yet *Vague Perception*. Incidentally, however, it would provide some support for Perkins and Bayne's

¹³ Dretske (1995, chapter 1) is an example of this sort of theory. Speaks (2015, pp. 47–48) discusses an instance of the relevant kind of vagueness.

premise: if it's vague what the content of an experience is, then plausibly it's vague whether the experience is accurate.

The second is the claim that observational predicates like 'looks red' are vague. Observational predicates give rise to a puzzle. Imagine a series of color patches that moves from red to orange so gradually that any two successive patches are pairwise indiscriminable. To avoid paradox, it seems that there will have to be a last patch that looks red. So there will have to be two pairwise indiscriminable patches such that only one of them looks red. This raises interesting questions about indiscriminability and observational predicates. But it does not suggest that one's experience of a color patch is itself vague, and those who have written about the puzzle have not taken it to do so.¹⁴

Vague Perception itself is mentioned in passing by Williamson (1994, p. 93) and Keefe (2000, p. 15).¹⁵ Relatedly, Sorensen (2022) suggests that mental imagery might be vague. Sorensen writes: "When rising suddenly after a prolonged crouch, I 'see stars before my eyes'. I can tell there are more than ten of these hallucinated lights but I cannot tell how many." Sorensen doesn't elaborate on the suggestion (or say why the imagery would be vague rather than just determinable). What I will say about perception should straightforwardly carry over to mental imagery.

¹⁴ See, for example, Dummett (1975), Raffman (1994), Graff (2001), and Hellie (2005).

¹⁵ Williamson considers a cursory argument for *Vague Perception*. Adapting a point from Friedrich Waismann, Williamson writes: "I saw that there were many stars in the sky. If the content of my visual impression is what I saw in that sense, visual impressions themselves—not just our descriptions of them—can be vague" (p. 93). Williamson doesn't evaluate the argument. See also his fn. 39 (p. 287).

2. The argument for *Vague Perception*

I'll start by developing a characterization of the phenomenon of linguistic vagueness. Then I'll show how the characterization can be extended to perceptual experiences. Finally, I'll show that some perceptual experiences satisfy it.

2.1. A sufficient condition for vagueness

Sorensen (2022) reports that “[t]here is wide agreement that a term is vague to the extent that it has borderline cases”. To say that ‘bald’ is vague is to say that there are, or could be, people who are borderline bald. The point can be made in terms of sentences: to say that the sentence ‘Harry is bald’ is vague is to say that the sentence could be borderline (holding fixed what it means). (Some may prefer to understand vagueness in terms of sorites-susceptibility; I will discuss a sorites paradox in §2.3.)

When is a sentence borderline? It seems to me that the characteristic feature of borderlineness is a sort of apparently irremediable ignorance. If one is a competent English speaker, the question of whether the sentence ‘Venus has about fifty spots’ is accurate seems to depend only on how many spots Venus has. But what’s puzzling is that, once you know that Venus has thirty-two spots, you still won’t know whether the sentence is accurate. It seems, at least pretheoretically, that no *possible* empirical investigation of Venus’s spots will tell you whether it's accurate. The question of whether it’s accurate might even seem ill-posed. I say ‘pretheoretically’ because an epistemicist might respond that there is some investigation that could help you figure out whether

the sentence is accurate: namely, investigation into the meanings of words.¹⁶ In the rest of this section, when I talk about empirical investigation, I mean to exclude semantic investigation, that is, investigations into the meaning of words or the accuracy-conditions of experiences. I take it an epistemicist would agree that, if Venus has thirty-two spots, we cannot learn whether ‘Venus has about fifty spots’ is accurate without semantic investigation.

I say ‘accurate’ rather than ‘true’ deliberately. Much work on vagueness centers on the truth-values of borderline sentences. This focus on truth has, I think, artificially restricted the study of vagueness to the domain of language. Other kinds of representations, like perceptual experiences, are incapable of being true or false. (At the very least, it would be odd to describe a perceptual experience as ‘true’.) But they are capable of being accurate or inaccurate. A characterization of linguistic vagueness in terms of accuracy, rather than truth, will be equally apt, while being generalizable to other kinds of representation.¹⁷

I should note one difference between accuracy and truth. Accuracy can come in degrees, whereas truth arguably cannot. A sentence can be fully accurate, or somewhat accurate, or more accurate than some other sentence; likewise, a perceptual experience. But plausibly a sentence cannot be fully true, or somewhat true, or more true than some other sentence. (Degree theorists of

¹⁶ See Williamson (1994, pp. 230–234).

¹⁷ I prefer to talk about vague sentences, rather than vague predicates, because it’s natural to talk about the accuracy of both sentences and experiences. The discussion could be reformulated in terms of vague predicates. Then the issue would be whether a predicate accurately applies to (or represents) an object, but it’s not quite so natural to talk about whether a perceptual experience accurately applies to (or represents) an object.

vagueness dispute this.) Even so, a sentence can also be accurate or inaccurate *simpliciter*. ‘Snow is white’ is accurate; ‘snow is green’ is inaccurate. Given that Venus has thirty-two spots, ‘Venus has about fifty spots’ might be somewhat accurate. But that is no objection to the claim that no amount of counting Venus’s spots, or any other empirical investigation, will help us figure out whether it is accurate *simpliciter*.¹⁸

What I have said so far is not yet a characterization of borderlineness. There are many things we can’t discover empirically, like mathematical and philosophical truths and certain physical matters like the exact position and velocity of a particle. What distinguishes a borderline sentence from matters like these is that, if the world were slightly different along some relevant dimension, it would no longer be empirically unknowable whether the sentence was accurate. Borderline cases fall in between clear cases. If Venus had fifty spots, or three, you could easily determine whether ‘Venus has about fifty spots’ was accurate just by counting the spots.

¹⁸ It may be worth noting two other possible differences between truth and accuracy. First, a sentence might be accurate or inaccurate with respect to a given level of generality. For example, ‘Venus has about fifty spots’ might be accurate with respect to the order of magnitude of Venus’s spots, but not with respect to the exact number of her spots. Nevertheless, it seems coherent to ask whether it is accurate *simpliciter*. The same goes for perceptual experiences. I thank an anonymous referee for raising this point. Second, truth, unlike accuracy, might be disquotational. But I do not see why our ability to disquote a representation should be required for the representation to be vague. Indeed, McGee and McLaughlin explain borderlineness by appealing to a correspondence theory of truth (1994, pp. 208–219).

This line of thinking yields the following sufficient condition for the borderliness of a sentence:

Borderline Sentence Condition. A sentence S is borderline if (a) no possible empirical investigation could tell us whether S is accurate, but (b) had the world been somewhat different along some relevant dimension, empirical investigation could have told us whether S was accurate.

A few clarifications are in order. By ‘us’, I mean competent speakers of the language of S . I set aside the possibility that we could fail to understand S due to its length or complexity. I don’t have exact definitions of ‘empirical’, ‘somewhat different’ or ‘relevant dimension’ to hand. As noted above, however, I do mean to exclude investigation into or difference in the meaning of S .¹⁹ The reference to “possible” empirical investigation reflects the fact that the empirical unknowability is not a function of, for example, the limits of current technology. We might add, to (a), that the question of whether S is accurate would seem somehow ill-posed, but this may be subjective; I have avoided doing so for that reason and for simplicity. Finally, by ‘whether S is accurate’, I mean ‘that S is accurate or that S is inaccurate’. If S is neither accurate nor inaccurate, then S satisfies (a). It’s also worth noting that some sentences are such that we could not learn that they’re accurate but could learn that they’re inaccurate (or vice versa)—for example, ‘Abe is the shortest tall man’.²⁰ Since we could learn that this sentence is inaccurate, it satisfies (b).

¹⁹ I also suppose that S is not an evaluative sentence, in order to avoid complications about whether empirical investigation suffices to discover evaluative facts.

²⁰ I thank an anonymous referee for this point.

The *Borderline Sentence Condition* is somewhat rough-and-ready. But I think it's good enough for present purposes. Importantly, it identifies just what's so puzzling about vagueness. When a sentence is vague, it is unclear to those *whose linguistic representation it is* how exactly the sentence represents the world to be. So the *Borderline Sentence Condition* reflects a helpful characterization of linguistic vagueness, while remaining neutral with respect to competing theories of what vagueness fundamentally consists in, or is caused by. To be clear, it does not hold that vagueness fundamentally consists in, or is caused by, a distinctive kind of ignorance; it merely holds that a distinctive kind of ignorance is a characteristic *symptom* of vagueness, one by which we pick out vagueness as a phenomenon of interest.

Now, recall that a sentence is vague just in case it is possible for it to be borderline. It will be helpful to have a name for this biconditional. Call it the

Vague Sentence Condition. A sentence *S* is vague just in case the world could be such that *S* is borderline (holding fixed *S*'s accuracy-conditions).

Other than in the fact that they concern sentences, nothing in the *Borderline Sentence Condition* or the *Vague Sentence Condition* is specific to language. The phenomenon of borderlineness is interesting because it involves our being ignorant, in a certain distinctive way, of the accuracy-conditions of our own representations. It is not, or at least not primarily, interesting because it involves language. If we encounter the same distinctive ignorance in another setting, it seems plausible to think it an instance of the same phenomenon. I therefore propose that we may make the following truth-preserving substitution to the *Borderline Sentence Condition* and the *Vague Sentence Condition*: we may substitute 'perceptual experience' for 'sentence'. Along with this substitution, 'us' will now refer to those who have the perceptual experience, rather than those who are competent in

the language. The substitution will yield sufficient conditions for perceptual borderlineness and perceptual vagueness.

The results of the substitution are:

Borderline Perception Condition. A perceptual experience E is borderline if (a) no possible empirical investigation could tell us whether E is accurate, but (b) had the world been somewhat different along some relevant dimension, empirical investigation could have told us whether E was accurate.

Vague Perception Condition. A perceptual experience E is vague just in case the world could be such that E is borderline (holding fixed E 's accuracy-conditions).²¹

These conditions are instances of general schemas concerning borderlineness and vagueness. I think the schemas give sufficient conditions for the vagueness of anything that has accuracy-conditions: sentences, perceptual experiences, beliefs, propositions, paintings, photographs, and more.²² I suspect variants concerning satisfaction-conditions apply to desires and preferences, variants concerning realization-conditions apply to hopes and plans, and so forth.

²¹ Could infants or non-human animals investigate whether an experience is accurate? If not—for example, if doing so requires the concept of accuracy—then these creatures can't have experiences that satisfy part (b) of the *Borderline Perception Condition*. But, since the *Borderline Perception Condition* is a sufficient condition, this doesn't preclude them from having borderline experiences. I think the three kinds of experience I discuss below are vague no matter what kind of creature has them.

Thanks to Chris Hill for pressing me on this point.

²² Admittedly, the schemas won't always be useful. They will tell us whether the proposition that Venus has about fifty spots is vague, but they won't tell us whether there is any such proposition.

In this paper, however, I'm only concerned with perceptual experiences. If any such experiences satisfy the *Vague Perception Condition*, then *Vague Perception* is true. I now turn to showing that some do. I'll give three examples.

2.2. Three vague experiences

Consider first a blurry experience of a square, as illustrated in Fig. 1. (The illustration may not be perfect. As Boghossian and Velleman 1989 note, there may be a phenomenal difference between a blurry experience of a clear square and a clear experience of a blurry square. It is meant to be merely suggestive.)

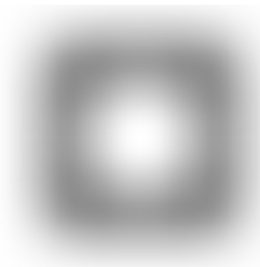


Fig. 1 Blurry experience of a square

Now consider three possibilities for the location of the real-world square relative to where it perceptually seems to be, as illustrated in Fig. 2.

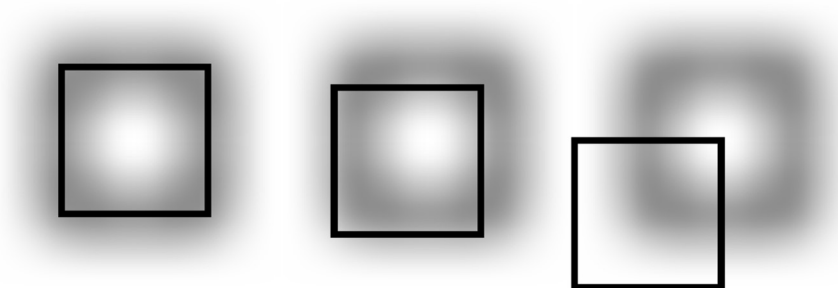


Fig. 2 Three possibilities for the location of the real-world square

In the possibility on the left, the real-world square is smack in the center of the blurry area. I say that, if that's where the square is located, your experience is accurate.²³ In the possibility on the right, the real-world square is far from the blurry area. I say that, if that's where the square is located, your experience is inaccurate. (If you disagree, imagine that the real-world square is farther away, or not even a square at all.)

What about the possibility in the center? In this case, it's not clear whether your experience is accurate. But you know what the experience is like, and you know where the real-world square is. No further empirical investigation could shed light on whether the experience is accurate. The question of whether it is might even seem somehow ill-posed. Of course, if the world were slightly different, as in the left or right possibility, some empirical investigation—namely, finding out where the real-world square is—would tell you whether the experience was accurate. So, if the real-world square is as shown in the center of Fig. 2, the experience satisfies the *Borderline Perception Condition*. It follows that, regardless of where the real-world square is, the experience satisfies the *Vague Perception Condition*.

(Strictly speaking, for the experience to satisfy the *Vague Perception Condition*, I need only have correctly described the center possibility and either the left or the right possibility: there need only

²³ Which is not necessarily to say that it's *fully* accurate. Perhaps, as an anonymous referee suggests, an experience must be fully determinate to be fully accurate. If this so, then it seems to me that an experience like that in Fig. 1 would be accurate *simpliciter* without being fully accurate. By comparison, if Venus has fifty spots, then 'Venus has about fifty spots' would be accurate *simpliciter* without being fully accurate.

be one case in which we could learn whether or not the experience was accurate. An equivalent point goes for the next two experiences I'll describe, though I'll omit mentioning it.)

Perhaps you disagree with my description of both the left and center possibilities in Fig. 2. Perhaps you think that every blurry experience is inaccurate. For example, you might agree with Dretske (2003) that a blurry experience represents objects in the world as blurry. Or you might agree with Allen (2013) that a blurry experience represents edges as being in many places at once. If you hold one of these views, hang on. I'll try to show that my other examples will work for you.

Alternatively, perhaps you think that the experience in Fig. 1 is accurate only if the real-world square is smack in the center of the blurry area, and inaccurate otherwise. Even if that's so, though, it's not pretheoretically apparent to you exactly where the center of the blurry area is. So there will be some location such that, if the real-world square is in that location, you won't be able to tell whether the experience is accurate. That suffices for the experience to satisfy the *Borderline Perception Condition*. (A similar point will go for the other examples.)

Some philosophers, including Tye (2002) and Nanay (2018), take blurry experiences to witness *Determinable Perception*. If they're right, then your experience is accurate just in case the edges of the square are within the determinable range of locations represented by the experience. What the center possibility in Fig. 2 illustrates is that a blurry experience is blurry all the way down. The determinable range does not have clearly defined borders. Instead, it has blurry borders. (And those borders have blurry borders, and so on.)²⁴ Even if the experience represents a determinable range of

²⁴ To be clear, on my view, the blurriness around the edges of the range is first-order vagueness, not higher-order vagueness. I suppose it's possible that the blur could have sharp borders, and thus represent a precise determinable range, but my blurry experiences at least aren't like that.

locations, it will still be unclear whether the square is within the range, and thus unclear whether the experience is accurate. So *Determinable Perception* doesn't suggest any objection to my description of the case. Indeed, I take my description of the case to be consistent with *Determinable Perception*—as I will suggest in §3.1, the experience might represent in both a vague and determinable way, as the predicate 'about fifty' does. (Again, a similar point will go for the other examples.)

For a variant on the blur case, recall that Russell (1923) imagines “a photograph which is so smudged that it might equally represent Brown or Jones or Robinson”. Imagine, instead of a smudged photograph, a perceptual experience so blurry that, when you have it, you seem to be seeing Brown, Jones, or Robinson. If in fact you're seeing one of these people, the experience is accurate. But imagine there's someone—Bronson—who looks somewhat like Brown, Jones or Robinson, so that, when you have the experience, you'd be less inclined to say that you're seeing Bronson, but you wouldn't completely rule it out. If in fact you're seeing Bronson, the experience is borderline.

My second example concerns color perception. It is a case that Morrison (2016) describes as follows:

While you're dining in a candlelit dining room you look at a tablecloth. You might report high confidence it's red rather than brown, but among some shades of red—crimson, scarlet, etc.—you might report the same degree of confidence.²⁵

The low lighting prevents you from seeing what fully determinate color the tablecloth is. Your ignorance is not caused by the vagueness of words like 'red', 'crimson' and 'scarlet', or by the determinability of the properties these words pick out. Imagine being presented with a color wheel

²⁵ P. 16. The case originally comes from Jeffrey (1965, p. 154).

and allowed to examine it under any lighting conditions you please. You still wouldn't be able to confidently identify what fully determinate color the tablecloth is.

It seems to me that, if the tablecloth is crimson, your experience is accurate. If the tablecloth is blue, your experience is inaccurate. But there are some shades of reddish-brown such that, if the tablecloth is one of those shades, it's not clear whether your experience is accurate, and no empirical investigation could tell you. (That's so even if you represent the tablecloth merely as having a determinable color, such as red.) If that's right, then, if the tablecloth is one of those shades, your experience satisfies the *Borderline Perception Condition*. So, regardless of the actual color of the tablecloth, your experience satisfies the *Vague Perception Condition*.

Earlier I mentioned two views on which every blurry experience is inaccurate. One was Dretske's (2003) view that blurry experiences represent their objects as blurry. There is no analogous view about color perception. The other was Allen's (2013) view that a blurry experience represents edges as being in many places at once. I suppose one might say that your experience of the tablecloth represents it as being many different colors at once, but I can't see the appeal of this view. So these two views about blur do not have plausible analogs that imply that every experience of color under low lighting is inaccurate.²⁶

²⁶ As an anonymous referee points out, there is a different view on which every experience of color is inaccurate. It is the view that objects in the world aren't really colored. If this is so—and if every visual experience is an experience of color—then every visual experience is inaccurate. That would undermine my argument for *Vague Perception*. That said, I still think there will be something vague about visual experiences. By comparison, there is something vague about the sentence 'there are about fifty round squares here'. I could, more clumsily, reframe the argument in terms of

My third and final example is your experience of Milo in the *Tale of Two Kitties*. I described your experience by saying that Milo appeared to you to have about fifty spots. But it's not vital that that be the best way to describe your experience. What's vital is that you could have an experience with the following properties. If Milo has fifty spots, the experience is accurate. If Milo has three spots, it's inaccurate. And, if Milo has thirty-two spots, no empirical investigation could tell you whether it's accurate. Empirical investigation might include not only counting Milo's spots, but also examining Milo, or any other spotted things, under any lighting conditions you wish. After all this, it would still not be clear to you whether the experience was accurate. It seems to me that you could have such an experience. If that's right, then the experience satisfies the *Vague Perception Condition*.

It's worth noting that recent research suggests that some property related to the number of spots is represented directly in your experience.²⁷ You don't merely infer it from other properties represented in your experience, like the locations of individual spots. Your experience might also represent the locations of individual spots,²⁸ but I'm only interested in how your experience

whether part of the experience is accurate, or whether the experience is accurate with respect to a certain matter, like the location of an edge. For simplicity, I will assume in the main text that some visual experiences are accurate.

²⁷ Munton (2020) summarizes the result as follows: "the visual system does not need to represent or count the individual members of a set to arrive at an impression of its numerosity" (p. 11). See also Clarke and Beck (2021), who complain that researchers tend to use the term 'numerosity' without explaining what numerosity is, if it's something other than number. What I am arguing, in effect, is that representations of numerosity are vague representations of number.

²⁸ See Pautz (2007, p. 508).

represents the number of spots. In the case described above, you do have an experience of the number of spots that is assessable for accuracy, not merely a belief.

Those are my three examples.²⁹ I've argued that the three experiences described—of shape, color, and number, respectively—satisfy the *Vague Perception Condition*, and thus witness *Vague Perception*.

2.3. A perceptual sorites paradox

My argument for *Vague Perception* took borderline cases to be characteristic of vagueness. But support for *Vague Perception* can also be found in the fact that the experiences just discussed give rise to a certain kind of sorites paradox.

To start again with language: we're inclined to accept tolerance principles for vague predicates. For example, we're inclined to accept that, if 'Harry is bald' is accurate when Harry has n hairs, it is accurate when Harry has $n + 1$ hairs. At least intuitively, this is due to the vagueness of 'Harry is bald', not (or not only) to the vagueness of 'accurate'. This tolerance principle gives rise to a sorites paradox. If we accept it, and if we accept that 'Harry is bald' is accurate when Harry has no hair, then we'll be forced to accept that 'Harry is bald' is accurate when Harry has a full head of hair, though it patently isn't. Note that, unlike some formulations of the sorites paradox, this formulation

²⁹ I've discussed only visual experiences, but experiences in other modalities will also qualify. For example, imagine hearing a drumroll and wondering how many beats it had or from which direction exactly it came.

mentions, rather than uses, the vague sentence ‘Harry is bald’. It will momentarily become clear why this is relevant.³⁰

It seems to me that we’re inclined to accept similar tolerance principles for perceptual experiences. If the experience of a blurry square is accurate when the square is at a certain location L , it’s accurate when the square is a nanometer away from L . That’s true even for apparently clear experiences. The grain of perceptual experience isn’t *that* fine. (I suspect even apparently clear experiences are vague.) This will give rise to sorites paradoxes in much the same way. If we accept a tolerance principle for the accuracy of the blurry experience in Fig. 1, and accept that it’s accurate in the outcome on the left of Fig. 2, we’ll be forced to accept that it’s accurate in the outcome on the right of Fig. 2, though it patently isn’t.³¹ Here it is important that the paradox mentions, rather than uses, the blurry experience, because experiences cannot be used in reasoning.

In §3.1, I’ll discuss several theories of linguistic vagueness. Each explains, in its own way, why we should reject the tolerance principle for ‘Harry is bald’. If any such theory can be extended to perceptual experience, it’s reasonable to expect that the theory will explain why we should reject the tolerance principle for the blurry-square experience. However, for reasons of space, I won’t explore exactly how each theory would permit us to resolve the paradox. I will focus instead on

³⁰ See the “forced-march sorites” of Horgan (1994) for a paradox that mentions, rather than uses, vague terms (pp. 173–176).

³¹ Unlike the sorites series that gives rise to worries about observational predicates and indiscriminability (see fn. 14), the series here is one in which the world varies while the experience itself is held constant. Perkins and Bayne (2013) use a series of this sort to motivate the claim that it can be borderline whether an experience is accurate (pp. 79–80).

what the theories say about borderline cases, which in turn will set up the discussion of perceptual puzzles in §3.2.

3. Consequences of *Vague Perception*

Why should we care about *Vague Perception*? I think there are two reasons. First, *Vague Perception* implies that any complete theory of vagueness will have to accommodate perceptual experiences. Second, it might turn out that some puzzling questions about the sorts of perceptual experiences I've been discussing are in fact questions about vagueness. Learning this might help us answer them. I will discuss these two issues in turn.

3.1. Consequences for the study of vagueness

It will be simplest and most economical to explain linguistic and perceptual vagueness in the same way. *Vague Perception* therefore presses us to see whether, and how, existing views about vagueness can be extended to perception—whether they can be cast in terms of representations in general, rather than linguistic representations in particular. Although it might turn out, at the end of the day, that linguistic and perceptual vagueness have different explanations, it is at least worth seeing whether a unified explanation is available.

Several popular theories of vagueness are, in their current forms, just theories of vague language.³² Most popular is probably the view that vagueness consists in semantic indecision.³³ The idea is that metasemantic facts don't draw precise boundaries around the extensions of vague terms. As McGee and McLaughlin (1994) put it, "our thoughts and practices in using the word 'bald' leave it unsettled whether 'bald' should apply" in certain cases (p. 214). Semantic indecision theorists tend to be supervaluationists, though the semantic indecision view (and supervaluationism itself) is consistent with a range of views about the truth-values of borderline sentences and other matters.³⁴

Can the semantic indecision view be extended to perceptual vagueness? It seems to me that it can. A semantic indecision theorist might posit that the metarepresentational facts that fix the content of a perceptual experience fail to fully settle matters. Following Perkins and Bayne's suggestion, such a theorist might hold that multiple different contents are equally good candidates to be the content of the experience.³⁵ Vagueness, then, will turn out to be the general

³² These theories might extend to other representations that are linguistic in nature, like concepts or Fregean propositions. But perceptual experiences are not linguistic in nature: non-linguistic animals can have them.

³³ The term 'semantic indecision' comes from Lewis (1986, p. 212).

³⁴ See Williams (2014).

³⁵ A variant: the experience has multiple different contents. This is analogous to plurivaluationism about vague language. See Caie (2018) and Sud (2020).

underdetermination of content. The ease with which the semantic indecision view generalizes may give its proponent an additional reason to endorse *Vague Perception*.³⁶

Another view, developed by Williamson (1994, 1997), holds that vagueness consists in a special kind of ignorance: ignorance due to semantic plasticity. On this view, vague terms have precise extensions, but their extensions are exquisitely sensitive to usage facts. Every borderline sentence is either true or false, but we're incapable of knowing which.

It seems to me that Williamson's view can also be extended to perceptual experience. The general idea is that our representations have accuracy-conditions that are not transparent to us, because they are exquisitely sensitive to metasemantic facts. In the case of perceptual experiences, however, these facts won't be usage facts. They might be facts about the precise workings of the perceptual system: for example, about what properties a certain kind of experience tracks most closely. Or they might be historical facts about the circumstances in which perception evolved.³⁷ Or they might be facts internal to the experience itself that we're incapable of perfectly introspecting. (By comparison, epistemicism about language needn't entail externalism about

³⁶ Representationalists about perceptual experience hold that perceptual experience consists in representation. If vagueness consists in the failure of metarepresentational facts to fully settle content, representationalists will have to accept that some experiences consist in representations whose content is not fully settled.

³⁷ See Tye (2000, p. 138).

meaning. Perhaps the accuracy-conditions of vague sentences depend on internal or dispositional facts that we're incapable of perfectly introspecting.)³⁸

A third view holds that vagueness derives from context-sensitivity. This is first and foremost a view about the sorites paradox. It holds that, as we move through the steps of the paradox, the extension of 'bald' changes due to changes in context. But the view also addresses borderline cases. According to Soames (1999, chapter 7), speakers are permitted to decide whether a vague predicate applies to a given borderline case, with their decision constrained by the conversational background. This view seems difficult to adapt to the perceptual setting. It's not clear what would play the role of the conversational background. According to Raffman (1994), it's up to us to judge whether a vague predicate applies; as long as we're linguistically competent, our judgments are infallible. Perhaps this more minimal thought, shorn of reference to conversational background, can be extended to perceptual experiences. If we judge a borderline experience accurate or inaccurate, that makes it so.³⁹

Some theories of vagueness start from vague propositions rather than vague language. Bacon (2018) proposes one such theory. On this theory, vague propositions are those that play a certain distinctive role in rational thought; vague sentences, in turn, are simply those that state vague

³⁸ I thank two anonymous referees for helping me to see how Williamson's view might be adapted to perceptual experience.

³⁹ Graff Fara (2000) gives a contextualist account emphasizing that the speaker's interests are part of the relevant context. However, Graff Fara takes the sorites paradox, rather than borderline cases, to be characteristic of vagueness, and explicitly refrains from giving an account of borderline cases. It might be worth exploring whether the perceiver's interests are relevant to the accuracy-conditions of a perceptual experience.

propositions. A degree theory of vagueness can also start from vague propositions. Here's one way to elaborate such a theory: say that propositions are fuzzy sets of possible worlds. (A fuzzy set is a set in which the membership relation comes in degrees.) A proposition is vague just in case it includes some possible worlds with degree strictly between zero and one. (This proposal is my own, but is based on Machina (1976), who takes predicates to have fuzzy extensions, and on Smith (2008), who takes properties to be fuzzy sets of objects.) Both Bacon's and the degree-theoretic accounts of vague propositions can be straightforwardly extended to perceptual experiences by way of the claim that vague perceptual experiences are just those that represent vague propositions. The result will be an attractively unified account of vagueness across different settings.

3.2. Consequences for the philosophy of perception

Now I turn to the consequences of *Vague Perception* for the philosophy of perception. Recall that, in the first part of the *Tale of Two Kitties*, your friend comments that Venus has "about fifty" spots. Given that Venus has thirty-two spots, some puzzling questions arise. Is your friend's comment accurate? Why can't you tell? If you trust the comment, what credence should you have that Venus has thirty-two spots? In response to these questions, philosophers have developed a range of ideas about vagueness, some of which I've just (briefly) covered.

The second part of the *Tale*, however, raises analogous puzzling questions about your experience of Milo. Is it accurate? Why can't you tell? If you trust the experience, what credence should you have that Milo has thirty-two spots? Philosophers of perception have developed a range of ideas in response to these questions. I'll mention three, and suggest that each might profitably be developed or modified once we understand the explananda to be problems of vagueness. (Or it

might turn out that one of the theories of vagueness already discussed, or some other theory of vagueness, will do the job in a way that's inconsistent with these three ideas.)

I've already mentioned *Determinable Perception*. On this view, your experience of Milo represents a determinable range of numbers of spots but no full determination of this range. The view gives similar accounts of the blurry square and the candlelit tablecloth cases.

Here are two worries one might have about *Determinable Perception*. First, recall from §1 that one motivation for it is the thought that there is no fully determinate number of spots that Milo seems to you to have. But there is likewise no precise range of spots that Milo seems to you to have. So, if the thought behind *Determinable Perception* is that, in these cases, your experience represents a precise range, this motivation for the view would seem to be undermined.

Second, recall Bacon's (2018) argument that I discussed in §1. If the content of your experience is a precise range, and if you update your credences by Bayesian conditioning on this content, you should wind up with a distribution of credences in the shape of a plateau, with equal credence in every number inside the range and zero credence in every number outside it. But it's plausible to think instead that you should distribute your credences in something like a bell curve. Morrison (2016) rejects *Determinable Perception* for a similar reason (pp. 32–33). He holds that, if the content of your experience is a determinable range, and if you trust the experience, you will distribute your credences in the shape of a plateau. But, if you trust the experience of Milo, you will distribute your credences in a bell curve.

Beck and Langedoc (2023) offer a response to this second worry. Their idea is that noise in the perceptual system can distort perceptual experience. They argue that, if the content of your experience is a precise determinable range, it may still be rational to distribute your credences in a bell curve to account for this noise. But this commits them to denying that it is (uniquely) rational to

update your credences by Bayesian conditioning on just the content of your experience.⁴⁰ So the second worry may only be a worry for the defender of *Determinable Perception* who wishes to avoid denying this, or who agrees with Morrison's view about trusting one's experience (which Morrison doesn't present as a view about rationality).⁴¹

I have mentioned two worries about *Determinable Perception*. In response to these worries, the friend of *Determinable Perception* can appeal to the possibility of a vague range. If your experience represents a vague range, as the predicate 'about fifty' does, then the first worry is immediately defused. (That's not to say, though, that every vague range can be named by an English predicate. 'About fifty' has several clear cases, including forty-nine and fifty-one, whereas your experience might represent a vague range with only one clear case, fifty.) A vague range might also defuse the second worry, explaining why you should have credences in the various numbers of spots in something like a bell curve. In particular, you might have variable credences across the borderline cases. By comparison, if you learn that Venus has about fifty spots, you might have some credence that she has thirty-three spots and some slightly lower credence that she has thirty-two (assuming both thirty-three and thirty-two are borderline cases of about fifty). Positing a vague range is no

⁴⁰ It is consistent with their view, however, that your experience provides more evidence than just its content. For example, it might provide evidence of the fact that you are having that experience (though see Bacon [2018], p. 109), or of the fact that you are having an experience that is characteristically associated with certain noise. It is consistent with their view that it is rational to update your credences by Bayesian conditioning on all this evidence.

⁴¹ Beck and Langedoc also critically assess two other responses to the second worry, due to Nanay (2020) and Raleigh and Vindrola (2021). For an alternative to Morrison's view about what is involved in trusting one's experience, see Beck (2019).

silver bullet: it's controversial what the content of 'Venus has about fifty spots' is, or whether there are multiple propositions that are equally good candidates to be its content. But the vagueness literature gives the *Determinable Perception* theorist options to draw on.

The second account of your experience of Milo comes from Clarke and Beck (2021). Clarke and Beck propose that the experience involves an "imprecise mode of presentation". They focus on number perception but suggest the same goes for experiences of other properties, including distance. Although they don't say what an imprecise mode of presentation is, they do say: "You can represent the number of coins in your pocket *precisely* as 'exactly six' or *imprecisely* as 'approximately six' or 'several'" (p. 8). In a response to Clarke and Beck, Peacocke (2021) offers the example 'roughly that many' (p. 48).

There are two ways in which these predicates might count as "imprecise": they're determinable, and they're vague. But Clarke and Beck don't seem to have determinability in mind.⁴² They allow that the content of an experience might be a determinable range (p. 12), but then it would be otiose for determinability to also enter the mode of presentation. They also say that "precise" number concepts are concepts that adults have but young children lack (p. 10). Just as young children lack the concept *six*, they also lack the concept *five to seven*. So, presumably, a precise (that is, non-vague) determinable range would count as "precise" in their sense. That leaves vagueness. So perhaps an "imprecise" mode of presentation is just vagueness.

Or perhaps Clarke and Beck should endorse a more specific theory of vagueness. They remain neutral on what lies behind the mode of presentation, but make three suggestions: a precise fully determinate number, a precise determinable range, or something probabilistic (p. 12). I'll address the third suggestion, the probabilistic view, shortly. But suppose one of the first two

⁴² Thanks to an anonymous referee for pressing me on this point.

suggestions is true. Suppose the accuracy-condition of your experience of Milo, as regards the number of his spots, is either a precise fully determinate number or a precise determinable range. It follows that some of our representations are such that, when we reflect on them, we can have only a rough handle on their precise accuracy-conditions. In this respect, their view will be a version of epistemicism.

Vance (2023) makes another proposal that might count as epistemicist. Vance argues that blur is attributable to “precision information”, and that this information is carried in an experience’s manner of representation rather than in its content. If the manner of representation can obscure an experience’s precise accuracy-conditions, then Vance’s proposal might be construed as a way of elaborating perceptual epistemicism. That said, it will be different than Williamson-style epistemicism in that our ignorance of the experience’s accuracy-conditions will not be due to metasemantic ignorance.

The third account I’ll mention is the *Perceptual Confidence View*. On this view, some perceptual experiences involve probabilities or degrees of confidence. Morrison (2016), who originates the view, and Munton (2016) note that your experience of Milo justifies various degrees of confidence in various fully determinate outcomes regarding Milo’s spots. (I’ll use the Milo example for ease of presentation, but neither Munton nor Morrison focuses on number perception in particular; they each discuss several perceptible properties.) Munton argues from epistemology. She holds that experiences justify doxastic states in virtue of their content, and concludes that the content of the experience must somehow involve degrees. Morrison argues from phenomenology. He holds that Milo *looks more probably* fifty-spotted than thirty-two-spotted, and concludes that the content of the experience must somehow involve probabilities. Both remain neutral on *how* the content involves

probabilities or degrees: perhaps the representation relation is degreed and multiple outcomes are represented to different degrees, or perhaps the degrees are part of the content itself.

It seems to me that Morrison's and Munton's arguments can be straightforwardly adapted to the sentence 'Venus has about fifty spots'. If you trust this sentence, you should have various degrees of confidence in various fully determinate outcomes regarding how many spots Venus has. Channeling Munton: plausibly, sentences justify doxastic states in virtue of their content. Channeling Morrison: the sentence seems to *say* that Venus is more likely fifty-spotted than thirty-two-spotted. From either premise, one might conclude that the content of the sentence involves probabilities or degrees. To the extent these points are persuasive in the case of Milo, it seems to me they should be persuasive in the case of Venus. Perhaps theorists of vagueness should take note.

Some theories of vagueness already come close to accommodating this conclusion. Consider a degree theory of truth on which propositions are fuzzy sets of possible worlds. Let W_i be the set of worlds in which Venus has i spots. The proposition that Venus has about fifty spots might include the members of W_{50} to degree 1 and the members of W_{32} to a lower degree, perhaps 0.4. Of course, these aren't degrees of confidence strictly speaking (since you aren't 40% confident that Venus is thirty-two-spotted). But there may be a close relationship between the two: Smith (2014) argues that degrees of confidence are simply expected degrees of truth. A variant on this view might resemble the degree supervaluationism of Williams (2014). All propositions are precise; a vague experience has many propositions that are equally good candidates to be its content; and the experience's degree of truth reflects the percentage of these candidates that are true. It's not exactly that the representation relation is degreed, but it's close. These degree-theoretic views are thus similar in spirit to the *Perceptual Confidence View*.

Bacon's theory of vague propositions is also similar to the *Perceptual Confidence View*. Bacon endorses bivalence rather than degrees of truth. But, on his view, a proposition is in part constituted by the distribution of credences across precise fully determinate outcomes that the proposition justifies (chapter 6). If a perceptual experience can have such a proposition as its content, Bacon's view will be consistent with Munton's premise that experiences justify doxastic states in virtue of their content. It will also explain why the rational distribution of credences is bell-shaped. It may even explain why, as Morrison holds, Milo looks more probably fifty-spotted than thirty-two-spotted.

One worry about the *Perceptual Confidence View* is worth mentioning. Suppose your experience of Milo attributes 5% confidence to fifty spots and 1% confidence to thirty-two. If Milo has fifty spots, is your experience accurate? What if he has thirty-two? The answers to these questions aren't obvious. Morrison thinks there is no "objective fact" about them: the notion of accuracy is up to the theorist to define, and any such definition will be somewhat arbitrary. Relatedly, he holds, the distinction between veridical and illusory experiences is "superficial and fuzzy" (pp. 39, 42).⁴³

If this is a consequence of the *Perceptual Confidence View*, it might be an objectionable one. One might think that perceptual experiences do have objective accuracy-conditions. Morrison even cites several philosophers who are committed to this claim (pp. 40–41). But the degree theory of truth and Bacon's theory of vague propositions, both similar in spirit to the *Perceptual Confidence View*, show us two ways in which there might be objective facts about the accuracy-conditions of representations that in some way involve degrees. On the degree theory of truth, there are objective

⁴³ Morrison takes 'veridical' to mean not illusory. It's not clear to me whether he thinks (or whether we should think) that veridicality is accuracy.

facts about degrees of truth. Bacon's theory reconciles classical bivalence about truth with propositions that have built-in rational credences. If a perceptual experience has a proposition of either sort as its content, it seems reasonable to think that the experience will be accurate, or at least veridical, just in case—or to the degree that—its content is true.

Every theory of vagueness comes with costs. If one already thinks, with the semantic indecision theorist, that content can be underdetermined; or, with the epistemicist, that the extension of 'tall' is precise to the nanometer; or that truth comes in degrees; or that propositions are as Bacon takes them to be, it's natural to ask whether one's money will go further and explain some puzzling features of the perceptual experiences I've discussed.

4. Conclusion

I argued that some perceptual experiences can be vague. In doing so, I proposed a general test for whether a representation is vague. Some other representations seem to be natural candidates: other mental representations, blurry photographs, impressionist paintings, hand-drawn maps. I suspect vagueness is a widespread feature of our representations of the world.

I then suggested ways in which theories of linguistic vagueness and theories of perceptual experience might cross-pollinate. If, as I argued, the phenomenon of vagueness arises in both language and perception, that gives us reason to search for a unified theory.

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