8 Perceptual Capacities

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When we perceive, we employ perceptual capacities by means of which we discriminate particulars in our environment. Seeing the red shade of an apple involves, for example, employing one's capacity to discriminate red from other colors. More generally, we can say that to be a perceiver is to possess certain capacities, to perceive is to employ those capacities and employing perceptual capacities constitutes perceptual states.

What are perceptual capacities? A perceptual capacity is a kind of discriminatory, selective capacity that we employ in perception, hallucination or illusion. It is a low-level mental capacity that functions to differentiate, single out and in some cases classify mind-independent particulars of a specific type—for example, to discriminate and single out instances of red from instances of blue. While discriminating particulars can include classification, it does not require it. To say that perceptual capacities are low-level is not to say that they are subpersonal but rather that they are cognitively less high-level than concepts (at least on most philosophical accounts of concepts). Perceptual capacities come in many varieties: There are perceptual capacities to discriminate luminance, motion, quantities, size, pitch, tone and distances, to name just a few. Some capacities are more basic than others. Some stand in complex hierarchical structures. Some are always employed jointly with other capacities.

Drawing on work in cognitive psychology, neuroscience and developmental psychology, this chapter provides an analysis of perceptual capacities. It includes the following key elements:

Function of a Perceptual Capacity: The function of a perceptual capacity C_α is to discriminate and single out mind-independent particulars α_1, α_2, α_3, . . . α_n, that is, particulars of a specific type.

Individuation Condition: A perceptual capacity Cα is individuated by the mind-independent particulars $\alpha 1$, $\alpha 2$, $\alpha 3$, . . . αn that the perceptual capacity functions to single out.

Possession Condition: A subject *S* possesses a perceptual capacity C_α if and only if the following counterfactual is true of *S*: *S* would be in a position to discriminate and single out a particular α_1, where α_1 is any

particular of the type that C_α functions to discriminate and single out, if *S* were perceptually related to α_1, (i) assuming *S* is perceptually capable (awake, alert etc.), (ii) assuming no finking, masking or other exotic case obtains and (iii) where *S* being perceptually related to α_1 means that (a) the situational features are such that α_1 is perceivable by *S* (good lighting conditions, etc.), (b) *S* has the relevant sensory apparatus that allows her to gain information about α_1 and (c) *S* is spatially and temporally related to α_1 such that *S* is in a position to gain information about α_1 via her sensory apparatus.

Fallibility Condition: If a subject *S* employs a capacity C_α, C_α can either fulfill its function or fail to fulfill its function, such that there is no difference at the level of employing C_α but only a difference at the level of fulfilling its function. The function of C_α is fulfilled if by employing C_α a relevant particular is singled out. The function of C_α fails to be fulfilled if by employing C_α no relevant particular is singled out.

Asymmetry Condition: The employment of a perceptual capacity C_α in cases in which C_α fulfills its function is metaphysically more basic than the employment of C_α in cases in which C_α fails to fulfill its function.

Repeatability Condition: A necessary condition for C_α to be a perceptual capacity is that C_α is repeatable.

Physical Base Condition: If a subject *S* is employing a perceptual capacity C_α, then there is a physical base of employing C_α that is constituted by physical processes, events and structures (such as the neural activity) of *S*.

Informational Base Condition: If a subject *S* is employing a perceptual capacity C_α, then there is an informational base of employing C_α that is constituted by the subpersonal psychological mechanism (information processing, computations and other subpersonal functional states, events and processes) of *S*.

I will provide an asymmetric counterfactual analysis of perceptual capacities that is built around these eight conditions. But first it will be helpful to give a brief history of the notion of capacity in cognitive science and philosophy and to lay out the benefits of analyzing the mind in terms of mental capacities.

1. Why Analyze the Mind in Terms of Mental Capacities?

The notion of a capacity is deeply entrenched in psychology and the brain sciences. Driven by the idea that a cognitive system has the capacity it does in virtue of its internal components and their organization, it is standard to appeal to capacities in cognitive psychology.[1] Critical in the advent of the notion of capacity in cognitive psychology was Chomsky's distinction between competence and performance, where a competence is a cognitive capacity and a performance is generated by employing a competence. In the case of language, a competence is a tacit grasp of the

structural properties of a language and the performance is the production of utterances (Chomsky, 1995).

In contrast to the centrality of capacities in psychology and the brain sciences, questions about mental capacities have been neglected in recent philosophical work.[2] This is surprising given their importance in the history of philosophy, in the work of Aristotle and Kant, in particular. Until the beginning of the twentieth century, capacities and related concepts such as abilities, skills, powers and categories featured prominently in philosophical and scientific work on perception. Indeed, it was standard to analyze the mind in terms of capacities. With the linguistic turn, the norms changed and it became standard to analyze the mind in terms of representational content instead. No doubt the linguistic turn brought with it much clarity and precision. However, in sidelining capacities, a great deal was lost. The good news is that we are not forced to choose between analyzing the mind in terms of capacities and analyzing it in terms of representational content. Indeed, I will argue that employing mental capacities constitutes the representational content of mental states.

The main benefit of invoking capacities in an account of the mind is that it allows for an elegant counterfactual analysis of mental states: It allows us to analyze mental states on three distinct yet interrelated levels:

1. A first level of analysis pertains to the function of mental capacities.
2. A second level of analysis pertains to the mental capacities employed, irrespective of the context in which they are employed.
3. A third level of analysis pertains to the mental capacities employed, taking into account the context in which they are employed.

On the first level, we focus on the function of perceptual capacities, which is to discriminate and single out particulars of a specific type. A perceptual capacity has this function even if it is employed while failing to fulfill its function, as is the case in hallucination and illusion. Even in such a case, the capacity functions to discriminate and single out particulars of a specific type. Moreover, a perceptual capacity has this function even if it is more often than not employed while failing to fulfill its function.

On the second level of analysis, we focus on what is in common between mental states in which the same perceptual capacities are employed. On this level, it is irrelevant whether or not a perceptual capacity is employed such that it fulfills its function. As I argue elsewhere, in perceptions, hallucinations and illusions with the same phenomenal character, the same perceptual capacities are employed. (Schellenberg, 2018b) So, on this second level of analysis, perceptions, hallucinations and illusions with the same phenomenal character are on a par.

On the third level of analysis, we focus on the fact that perceptual capacities are employed in a specific environment, whereby a particular

is either successfully singled out or the experiencing subject fails to single out a particular. In contrast to the second level, it matters, on this third level, whether or not a capacity is employed such that its function is fulfilled. So, on this level, perceptions differ from hallucinations and illusions. This is the level of analysis on which we determine the token content of the relevant experiential state.

2. The Function of Perceptual Capacities

Perceptual capacities function to discriminate and single out particulars. More precisely:

> *Function of a Perceptual Capacity:* The function of a perceptual capacity C_α is to discriminate and single out mind-independent particulars α_1, α_2, α_3, . . . α_n, that is, particulars of a specific type.

A particular, as understood here, is a mind-independent object, event or property-instance. I use the notion of "singling out" rather than "referring" so as to remain neutral on whether perceptual capacities are conceptual or nonconceptual. While referring has been argued to require conceptual capacities, singling out particulars requires no such capacities. Singling out a particular can be understood as a proto-conceptual analogue of referring to a particular. Non-rational animals and infants as young as four months old can perceptually single out particulars in their environment, yet on at least some notions of "reference" they do not have the capacity to refer. Moreover, on many views of reference, referring to a particular presupposes that the relevant subject is in a mental state with content.[3] While I will show that analyzing perceptual states as constituted by employing perceptual capacities entails that those perceptual states have representational content, we can remain neutral for now on whether perceptual experience has content. Thus, I use the term "singling out" so as not to presuppose a representational view.

The notion of function in play is a notion of natural function. It is natural in that it is independent of interpretation. So what function a capacity has is not relative to an interpreter.[4] There are many different kinds of perceptual capacities. There are perceptual capacities that function to discriminate and single out objects of a specific type. Others function to discriminate and single out property instances of a specific type. Still others function to discriminate and single out events of a specific type.

Natural functions can be given an etiological analysis; we can, however, work with the notion of a natural function while rejecting such an analysis. As I will argue, that is what we should do. According to etiological theories, something has a certain function because of what it is selected and adapted for (Ayala, 1970, Wright, 1973, Millikan, 1989, Neander, 1991).[5] Consider the heart's function to pump blood.

The etiological theory explains this function by pointing to the fact that hearts were selected for pumping blood. While this is no doubt how it causally came about that hearts have the function to pump blood, *the fact* that hearts have this function is neutral on *how* they came to have it. Even if hearts came to have their function by some other means, they could still have the function to pump blood. More generally, we should distinguish what function something has from how it came to have that function. What is crucial for an analysis of capacities is what function they have, not how they came to have it.

In contrast to etiological theories, the view developed here is neutral on how mental capacities came to have their function. No doubt we have the perceptual capacities that we do due to our phylogenetic and ontogenetic background. The point is that we can analyze the function of those capacities without appealing to how we came to have them. Indeed, there is no sense in which the phylogenetic or ontogenetic history of a subject is relevant for determining the function of her capacities. A subject who discriminates and singles out particulars in her environment via an implant can have perceptual capacities with the very same function as a subject who has those capacities due to her phylogenetic and ontogenetic background. While most mental capacities happen to have their function due to natural selection or some other natural process, nothing in the account developed here hinges on the matter.

For this reason, the account of mental states developed here does not face well-known problems of etiological theories of mental content. It does not, for example, face the problem of how to account for complex capacities, the possession of which cannot be explained in terms of natural selection, adaptation or meme selection. Moreover, by contrast to etiological accounts, it does not face Davidson's Swampman objection (Davidson, 1987: 443–444). Swampman is a creature that by astounding coincidence came into existence through a collision of particles caused by a lightning bolt. At the very same moment, Donald Davidson is struck by a lightning bolt and tragically dies. Swampman is a physical duplicate of Davidson, but his history is radically different. He did not partake in any evolutionary history and there are no phylogenetic, ontogenetic or other etiological ways to explain his mental states. For this reason, etiological accounts of function are forced to say that Swampman's component parts do not have any functions. But according to capacitism, the view developed in the course of this book, a function is in no way dependent on the history of the subject employing the relevant capacity. Therefore, capacitism posits that Swampman possesses all the capacities that Davidson possessed shortly before being struck by lightning. Indeed, I argue that neither the content nor the epistemic force of a mental state depends on the history or reliability of employing the capacities that constitute that mental state. Since capacitism holds that the function of perceptual capacities is independent of the history of the subject employing those

capacities, the view posits that Swampman not only has mental states with content but also mental states with epistemic force.[6]

A perceptual capacity has a certain function irrespective of whether it fulfills its function in any particular context of employment. To explain why, it is helpful to distinguish capacities from their employment. While a capacity is a kind of mental tool, the employment of a capacity is a mental activity. Consider Sam, who possesses the perceptual capacity that functions to discriminate and single out red particulars. Just as Sam's heart has the function to pump blood but may fail to pump blood, so Sam may employ her capacity while failing to single out any red particular. In such a case, the capacity failed to fulfill its function because the target of employing the capacity is not present: No red particular was discriminated and singled out.

A few clarifications are in order before we move on to developing the individuation conditions of perceptual capacities. First, for *f* to be a natural function does not imply that *f* is a biological function. While biological functions are natural functions, not all natural functions are biological functions. After all, a computer can have a natural function, but it does not have a biological function.

Second, it is crucial that the function of a perceptual capacity is not just a matter of discriminating particulars but is also a matter of singling them out. Due to this, perceiving an instance of red is distinct from perceiving an instance of blue. Both cases may involve discriminating red from blue, but in the former case an instance of red is singled out, while in the latter case an instance of blue is singled out. So the capacities employed are distinct and the perceptual states constituted by employing those capacities differ.

Third, while capacitism is compatible with functionalism, it does not commit one to functionalism. Functionalism individuates mental states not with regard to their internal constitution or their relation to the environment but on the basis of their function in the cognitive system of which they are a part (e.g., Lewis, 1966, Block, 1978). Capacitism individuates mental states on the basis of mental capacities and mind-independent particulars: Mental states are constituted by the mental capacities employed and the particulars (if any) thereby singled out. The function of those capacities is not understood in terms of the role those capacities play in the cognitive system of which they are a part. Thus, capacitism does not entail functionalism. There may, however, be good reasons to integrate capacitism in a functionalist view of the mind.

2.1. Material Discrimination

When we perceptually discriminate α from β, we discriminate an actual, mind-independent particular α to which we are perceptually related from a distinct actual, mind-independent particular β to which we are similarly

perceptually related. Let's call this kind of discrimination *material discrimination*. When I speak of discrimination without further qualification, I mean always material discrimination. Discriminating between two particulars in this sense does not require attending to both particulars. It requires only registering their differences. Consider Dylan, who is walking through thick foliage. It is unclear how she could be perceptually aware of, say, a leaf without registering how it differs in at least one respect from its surround. More generally, it is unclear how one could be perceptually aware of a particular without registering how it differs in at least one respect from its surround. The basic level of employing perceptual capacities is to discriminate one particular from another, where this discrimination is understood as registering their differences.[7]

Material discrimination is distinct from any notion of discrimination understood in terms of carving out possibility space. On such notions, to discriminate α is to discriminate α from other possible ways α could be. In particular, material discrimination is to be distinguished from the notion of discrimination in relevant alternative views of knowledge (Austin, 1946, Dretske, 1969, 1981, Goldman, 1976), contextualism and pragmatic encroachment accounts (Hawthorne, 2003, Stanley, 2005, DeRose, 2009), as well as contrastivism (Schaffer, 2005). Subtleties aside, such views have it that to know that an object *o* has property *F* (in some circumstance), one must be able to rule out some relevant alternatives, that is, certain relevant situations in which *o* has, say, property *G* rather than *F*. On this notion of discrimination, to discriminate a property *F* that an object *o* instantiates is to discriminate *F* from relevant alternative ways *o* could be. As Pritchard puts it:

> In the perceptual case at least, to be able to rule out an alternative is to be able to make the relevant discriminations between the target object and the object at issue in the alternative—e.g., to be able to discriminate between goldfinches and woodpeckers.
>
> (Pritchard, 2010: 246)

On such relevant alternative views of knowledge, discrimination is necessary for knowledge: To know, one must discriminate the way things are from relevant other ways they might be. The notion of discrimination is a matter of modal appreciation.[8]

Material discrimination is distinct from discriminating relevant alternatives in two ways. First, material discrimination is a matter of noticing differences between actual, mind-independent particulars to which one is perceptually related rather than appreciating relevant alternatives. Second, material discrimination need not be cognitive (and typically is not), while any kind of modal appreciation and modal theorizing falls squarely in the cognitive realm. It is standard to distinguish perception and cognition. Perception is a kind of mental faculty that we share with

non-rational animals. While human perception might be rife with top-down effects, there is no reason to think that modal appreciation is constitutive of perception.

Material discrimination is distinct not only from appreciating relevant alternatives but also from detecting differences between mental states via introspection. It has been argued that two phenomenal states M_1 and M_2 differ if and only if their subject can introspectively tell them apart. (Shoemaker, 1994) I am not denying that we *can* discriminate between phenomenal states in this way. We can call this *introspective discrimination*. The important point here is that in perceiving our environment, we discriminate between external, mind-independent particulars rather than mental states or aspects of mental states. According to capacitism, discriminating such particulars constitutes perceptual states and indeed phenomenal character and so is more basic than introspective discrimination.

3. The Individuation Condition

Perceptual capacities are individuated by the external, mind-independent particulars that they function to single out.

Individuation Condition: A perceptual capacity C_α is individuated by the mind-independent particulars α_1, α_2, α_3, . . . α_n that the perceptual capacity functions to single out.

Given that perceptual capacities are individuated externally, the perceptual capacity that functions to single out instances of red differs from the perceptual capacity that functions to single out instances of scarlet or vermilion. There will be a perceptual capacity to discriminate and single out instances of red, a distinct perceptual capacity to discriminate and single out instances of scarlet and yet another perceptual capacity to discriminate and single out instances of vermilion. So perceptual capacities can be more or less fine-grained, and we can single out the very same particular with capacities that are more or less fine-grained. Suppose you see a field of flowers that are shades of red and yellow. You can employ your capacity to discriminate between red and yellow and thus be aware of a field of red and yellow flowers. Alternatively, you can employ your capacity to discriminate between crimson, scarlet and vermilion and between lemon, mustard and ocher and thus be aware of the colors in front of you in a more fine-grained way.

The external, mind-independent property instances that we can perceive do not just include instances of intrinsic properties, such as intrinsic shapes, colors, sounds, smells, textures and the like.[9] We always perceive from a perspective. As a consequence, we perceive under situational features, that is, features such as the lighting conditions, color context, the acoustic conditions and our location in relation to the particulars perceived. Thus, when we perceive a circular coin from different angles, there

is a respect in which the coin looks circular throughout but also a respect in which the coin's appearance changes. Likewise, when we perceive two trees of the same size located at different distances from us, there is a respect in which they look the same size, but also a respect in which they appear different. (Peacocke, 1983) Perception has both an *invariant* aspect—an aspect that remains stable across changes in perspective—and a *variant* aspect—an aspect that changes depending on one's perspective. How should we account for the variant aspect of perception?

One option is to understand the variant aspect in terms of situation-dependent properties.[10] A situation-dependent property is an external, mind-independent property that is determined by an intrinsic property and relevant situational features (e.g., the perceiver's location relative to the perceived intrinsic property, the lighting conditions, acoustic conditions, etc.). Situation-dependent properties are exclusively sensitive to and ontologically dependent on intrinsic properties and situational features. Any perceiver occupying the same location would, *ceteris paribus*, be presented with the same situation-dependent property. As with intrinsic properties, perceivers differ, however, with regard to which situation-dependent properties are perceptually available to them, and they differ in how they represent and are aware of situation-dependent properties. If this is right, then the external, mind-independent property instances that we can perceive include situation-dependent properties in addition to intrinsic properties.

The boundaries of the set of particulars that a capacity functions to single out is set by the world. It is not set by what a perceiver takes her perceptual capacity to function to single out. So the boundaries of my capacity to discriminate and single out squares is set by squares, not by what I take to be squares. If in perception I take something to be a square that is not in fact a square, I employ my perceptual capacity to discriminate and single out squares baselessly, while failing to single out a square. Thus, I presuppose a strong form of realism.

As we have seen, perceptual capacities are with regard to their individuation conditions analyzed in terms of mere relations to the world and so without any appeal to mental entities, be they, states, capacities or events. In this respect, capacitism builds on causal views of mental states. (Kripke, 1972'; Putnam, 1975; Burge, 1979; Devitt, 1981) However, as I will argue shortly, with regard to their possession conditions, the situation is more complex: The possession of at least some perceptual capacities requires possessing other perceptual capacities.

4. The Possession Condition

Perceptual capacities cannot be analyzed independently of analyzing their possession conditions. To possess a perceptual capacity is to be in a position to discriminate and single out the external, mind-independent particulars that the capacity functions to single out when perceptually related to such particulars and some further conditions hold. So if we

possess such a capacity, then—assuming no exotic case obtains—the following counterfactual holds: If we were perceptually related to a particular that the capacity functions to single out, then we would be in a position to discriminate and single out that particular. More precisely:

Possession Condition: A subject *S* possesses a perceptual capacity C_α if and only if the following counterfactual is true of *S*: *S* would be in a position to discriminate and single out a particular α_1, where α_1 is any particular of the type that C_α functions to discriminate and single out, if *S* were perceptually related to α_1,

i. assuming *S* is perceptually capable (awake, alert, etc.),
ii. assuming no finking, masking or other exotic case obtains, and
iii. where *S* being perceptually related to α_1 means that (a) the situational features are such that α_1 is perceivable by *S* (good lighting conditions, etc.), (b) *S* has the relevant sensory apparatus that allows her to gain information about α_1 and (c) *S* is spatially and temporally related to α_1 such that *S* is in a position to gain information about α_1 via her sensory apparatus.

The condition requires only that a subject be in a position to discriminate and single out a particular of the type that C_α functions to single out when perceptually related to one and not that she in fact do so. The reason for this is that even if the subject is perceptually related to a relevant particular, she might for a variety of reasons fail to single out the particular, perhaps because she does not notice the particular due to her attention being directed elsewhere.

It will be helpful to specify each qualification of what it is to be perceptually related to a particular. The qualification that the subject is perceptually capable rules out cases in which the subject is not at that particular moment able to employ her perceptual capacity (perhaps because she is intoxicated or sleepy), even though she is generally capable of doing so. The qualification that no finking, masking or other exotic cases obtain rules out cases in which the subject mysteriously loses her capacity from one moment to the next. The inference from a claim about perceptual capacities to a counterfactual fails in such cases.[11] However, all the standard ways of fixing the disposition-to-counterfactual inference can be exploited for the capacity-to-counterfactual inference (see Lewis, 1997). Finding a formulation of the capacity-to-counterfactual inference that is indefeasible in light of all possible finking, masking and similarly exotic cases would be a project of its own. Therefore, I will here work on the independently plausible assumption that no such exotic cases obtain.

The first specification of what it means to be perceptually related rules out cases in which the subject is causally related to a relevant particular α_1, but it is, for example, too dark or too noisy for her to perceive

the particular. The second specification rules out cases in which the relevant subject does not have the sensory apparatus to perceive α_1, perhaps because her sensory organs are damaged. The third specification rules out cases in which the subject is causally related to a relevant particular α_1, but not in a way that allows her to gain information about α_1 via her sensory organs—perhaps because α_1 is so close to her eyes that she cannot properly make it out or so far away that she is unable to discriminate it from its surround.

Successfully employing a perceptual capacity to discriminate and single out particulars of a type requires being differentially sensitive to particulars of that type in one's environment. However, the counterfactual analysis of perceptual capacities entails that one could possess a perceptual capacity despite not being able at that very moment to respond differentially to the relevant particulars. If one is sufficiently intoxicated, one might not be able to respond differentially to much at all. In such states, one nonetheless possesses perceptual capacities. Moreover, if one does not have the relevant sensory apparatus or one's sensory apparatus is impaired, one cannot be perceptually related to particulars that the perceptual capacity functions to discriminate and single out. In those cases too, one nevertheless can possess perceptual capacities. One will just not be in a position to employ them while fulfilling their function without being appropriately connected to a sensory apparatus. In short, while *successfully employing* a perceptual capacity requires being differentially sensitive to particulars of the relevant type in one's environment, *possessing* a perceptual capacity is not subject to this requirement.

There are several close alternatives to the counterfactual analysis provided. A conditional could, for example, be formulated in terms of a "might" or a "could."

If the conditional were formulated in terms of a "might" or a "could," the link between possessing a perceptual capacity and successfully employing it would be too weak to entail a constitutive relation between the perceptual capacities employed and the perceptual states thereby constituted.[12] Therefore, it is crucial that the conditional is formulated in terms of a "would."

Now one might wonder what the connection is between possessing specific capacities and possessing closely related capacities. One might wonder, for example, whether there could be a perceiver who possesses only the capacity to discriminate red from other colors without possessing any perceptual capacities to discriminate and single out other colors. More radically, can there be a perceiver who possesses only one perceptual capacity? In response, there is empirical evidence that possession of at least some perceptual capacities comes in clusters. For example, if one is able to discriminate angles from straight lines, one will also be able to discriminate curves from straight lines. And if one possesses the capacity to discriminate, for example, red from blue and single out red, one will

also possess the capacity to discriminate blue from red and single out blue.[13]

4.1. Possessing a Capacity vs. Employing a Capacity

What is the relation between possessing a capacity and employing it? It has been argued that one cannot claim one possesses a capacity if one has never employed it successfully (Aristotle, *De Generatione Animalium* 2.3, 736b21–6 & 4.1, 766a5–10).[14] It has been argued, moreover, that if one employs a capacity without it fulfilling its function, then one does not claim to possess the capacity at that moment (Millar, 2008). Aristotle attributes a view that is even more restrictive to the Megarians:

> There are some—such as the Megarians—who say that something is capable only when it is acting, and when it is not acting it is not capable. For example, someone who is not building is not capable of building, but someone who is building is capable when he is building; and likewise, too in other cases. It is not hard to see the absurd consequences of this.
>
> (Metaphysics, Book: 1046b)

On the Megarian view, one can possess a capacity only when one is successfully employing it.

Against all these views, I am arguing that we can possess a capacity even if we never employ it. Possessing a capacity is thus metaphysically more fundamental than employing a capacity: A subject cannot employ a capacity that she does not possess, but she can possess a capacity without ever employing it.

Aristotle's distinction between first and second potentiality of capacities and first and second actuality of capacities is helpful here (*De Anima* II.5: 417a22–417a30). We can distinguish between an English speaker's innate capacity to speak a language (first potentiality), her capacity to speak English when she is sleeping (second potentiality) and her capacity to speak English when she is speaking English (second actuality). If one has first potentiality of a capacity, one is the kind of being that could possess that capacity. If one has second potentiality of a capacity, one possesses that capacity (Aristotle also calls this the first actuality of a capacity). If one manifests the second actuality of a capacity, one employs the capacity successfully.

A necessary condition for possessing a capacity is to be the kind of being who could possess that capacity and to meet some further constraint, such as being in an environment in which one has the opportunity to come to possess the capacity. Aristotle expresses this idea when he maintains that first potentiality is prior to second potentiality (or first actuality). A necessary condition for employing a capacity is to possess that capacity and to meet some further constraint, such as being in a

suitable environment. Aristotle expresses this idea when he maintains that first actuality is prior to second actuality.[15]

5. The Fallibility Condition

So far, we have analyzed perceptual capacities in light of their function to discriminate and single out particulars in perception. What happens when we fail to single out what we purport to single out, such as in cases of hallucination and illusion? I argue that perceptual capacities are fallible in that the very same perceptual capacity can be employed in perception, hallucination and illusion.

Fallibility Condition: If a subject *S* employs a capacity C_α, C_α can either fulfill its function or fail to fulfill its function, such that there is no difference at the level of employing C_α but only a difference at the level of fulfilling its function. The function of C_α is fulfilled if by employing C_α a relevant particular is singled out. The function of C_α fails to be fulfilled if by employing C_α no relevant particular is singled out.

The relevant alternative to understanding capacities as fallible is to understand them as infallible. Millar among others understands perceptual capacities (including recognitional capacities) in this way:

> If I had judged falsely that the plants in the plot were azaleas, I would not have exercised the recognitional ability in question. The general point here is that the notion of the exercise of a recognitional ability is a *success* notion.
>
> (Millar, 2008: 333)

If capacities are understood as infallible, then one cannot employ a capacity if one does not succeed in fulfilling its function. I will not here argue against infallibilist views of capacities but will focus rather on why we should understand perceptual capacities as fallible.

By way of analogy, consider that if we possess a concept, then we can employ it even if we fail to refer. After all, if we say "That's a horse," pointing to where in fact there is no horse, we are arguably using the very same concept horse that we would use if we were successfully pointing at a horse. The difference between the former and the latter case is simply that in the former, but not the latter, we fail to refer. The failure occurs at the level of reference. There is no failure at the level of employing the concept. If that is right, then there is no reason to think that the two cases differ with regard to employing the concept horse.

The very same thing can be said of perceptual capacities. If we possess a perceptual capacity, then we can employ it even if we are not accurately perceiving. One could be prompted to employ a perceptual capacity due to non-standard circumstances: Unusual brain stimulations or misleading

distal inputs, for example. Given that capacities are determined by functional relations between the perceiver and her environment and not by individual token responses, we can employ a capacity even if a relevant particular is not present. If this is right, then like concepts, perceptual capacities are fallible.

If we employ a concept but fail to refer, the concept employed remains empty. Analogously, if we employ a perceptual capacity but fail to single out a particular, the capacity is employed *baselessly*. It is employed baselessly in the sense that the usual target of discrimination and selection—an external, mind-independent particular—is absent.

Let's consider some examples. In the paradigmatic case of hallucination, it seems to us that there is an object where in fact there is no such object. Consider Kim when she hallucinates a white cup. She employs her capacity to discriminate and single out an object of a certain type. Moreover, she employs her capacity to discriminate and single out white from other colors along with capacities to single out various other property instances: Luminance, shapes, textures and so on. Since she is hallucinating and so not perceptually related to a white cup, all these capacities are employed baselessly.

In the paradigmatic case of illusion, it seems to us that an object has a property that it does not in fact instantiate. A subject who is suffering an illusion is not perceptually related to at least one particular that she purports to single out. Say she sees an object that instantiates property π, but given misleading circumstances, it seems to her (falsely) to be instantiating property ρ. In such a case, she employs her capacity to discriminate and single out an instance of ρ. But given that there is no ρ-instance present, she employs that capacity while failing to single out any particular. In the typical case, she will be employing several other capacities successfully. But insofar as she is suffering an illusion, she employs at least one capacity baselessly.

Now in perception the particulars between which we discriminate are mind-independent particulars in our environment. This invites the question: What do we discriminate between when we employ perceptual capacities baselessly? In response: When we employ a capacity baselessly, we are not discriminating any mind-independent particulars. Indeed, we are not discriminating any particulars. We are employing a mental tool without that mental tool fulfilling its function. The important point for present purposes is that the fact that the mental tool is not fulfilling its function does not imply that we are not employing the mental tool.

5.1. The Dependence of Perceptual Capacities on Mind-Independent Particulars

I have argued that while perceptual capacities are individuated by the particulars they function to single out, they can nonetheless be employed

baselessly. This invites the question of whether perceptual capacities are dependent on the particulars they function to single out.[16] There are at least three different ways of understanding this question, each of which requires its own response.

One way of understanding it is as a question about possessing capacities. Could a subject possess a perceptual capacity, even though she has never been perceptually related to a particular of the kind that the capacity functions to single out? In response: Yes. After all, the capacity could be innate. The perceiver may have been unlucky and never been perceptually related to a relevant particular. So, despite possessing the capacity, the perceiver will never have had a chance to employ her capacity to successfully single out a relevant particular.

A second way of understanding the question is as a question about employing capacities. Could a perceptual capacity be employed even if the relevant particular is not present? In response: Yes. As noted, a perceptual capacity could be employed in the absence of any relevant particular. This occurs in cases of hallucination and illusion.

A third way of understanding the question is as an existence question. Could a perceptual capacity exist that functions to single out a kind of particular that does not exist and has never existed? In response: No. Any perceptual capacities must be grounded in perception in the sense that any perceptual capacity must have been employed successfully by someone, somewhere. If that is right, then a perceptual capacity could not exist if no particular of the kind exists that the capacity functions to single out.[17]

In sum, while perceptual capacities are individuated by the particulars they function to single out, they are dependent on particulars only in the following sense: A perceptual capacity could not exist if no particular that it functions to discriminate and single out exists or ever has existed.

6. The Asymmetry Condition

While perceptual capacities are fallible and employable in perception, illusion and hallucination alike, there is an asymmetry between employing a capacity in perception and employing that same capacity in hallucination or illusion.

Asymmetry Condition: The employment of a perceptual capacity C_α in cases in which C_α fulfills its function is metaphysically more basic than the employment of C_α in cases in which C_α fails to fulfill its function.

The reason for this asymmetry is that it is the function of a perceptual capacity to discriminate and single out particulars. It is not its function to fail to single out particulars. This is the case even if a perceptual capacity is more often than not employed unsuccessfully. As a consequence, there is both an explanatory and a metaphysical primacy of the employment of a perceptual capacity in perception over its employment in hallucination or illusion.

There is an explanatory primacy of employing a perceptual capacity in perception over its employment in hallucination or illusion since one can give an analysis of the capacity employed in hallucination or illusion only by appealing to its role in perception. Consider again Kim when she suffers a hallucination of a white cup on a desk. Even though she fails to single out anything white, she is in a phenomenal state that is as of an instance of white in virtue of employing the capacity to discriminate and single out white from other colors. She would single out an instance of white *were* she perceptually related to a white cup—assuming again that no finking, masking or other exotic case obtains. After all, she is employing a perceptual capacity the very function of which is to differentiate white from other colors and to single out white in her environment. In this sense, we need to refer to what Kim would discriminate between and what she would single out in perception to explain the role of the capacities she employs in hallucination.

Licensing this explanatory primacy, there is a metaphysical primacy of employing a perceptual capacity in perception over its employment in hallucination or illusion. There is such a metaphysical primacy since a perceptual capacity functions to do what it does in perception, namely, discriminate and single out particulars. It does not function to do what it does in hallucination or illusion, namely, fail to discriminate and single out the particular that one purports to single out. On one understanding of metaphysical primacy, we can associate things with natures and see if the nature of one thing makes reference to another. If so, the latter will be said to be relatively primary and the former secondary. We can then construct chains so that if the nature of *A* makes reference to *B* and the nature of *B* makes reference to *C*, then *C* will be primary, *B* secondary and *A* tertiary. According to capacitism, in hallucination and illusion the subject employs her perceptual capacities while failing to fulfill their function, and these capacities are by their nature defined in terms of success in the perceptual case. Thus, the perceptual case is relatively primary and the hallucination and illusion cases are secondary. For the reasons discussed under the fallibility condition, the asymmetry condition does not imply that we must have successfully used a perceptual capacity in the past to employ that capacity in hallucination.

Another way of expressing the idea motivating the asymmetry condition is as follows: The fact that we can employ capacities while failing to single out particulars depends on the fact that we can employ such capacities to single out particulars. This idea is analogous to the idea that misrepresentation depends on representation. Indeed, if employing perceptual capacities yields representational content, the two ideas go hand in hand.[18]

The proposed asymmetric counterfactual analysis of perceptual capacities differs in significant ways from Fodor's asymmetrical causal dependence account of mental representation (Fodor, 1987, 1990). According to Fodor, a mental state represents properties or objects only if it is reliably

tokened by the presence of the relevant properties or objects. A mental symbol represents, say, pigs only if it is reliably tokened by pigs. So reliability is a necessary condition for Fodor's account: Symbols of cognitive systems represent because of regularities between those cognitive systems and environments. Such regularities also explain what it is for such symbols to represent in the first place. Like all tracking theories (Dretske, 1981; Millikan, 1984), Fodor's account faces indeterminacy problems. It fails to ground determinate content, which is required not just for avoiding Quinean indeterminacy problems (e.g., undetached pig parts, pig timeslices), but also to allow for the possibility of misrepresentation (and thus for avoiding the "disjunction" problem) and for ruling out proximal contents (e.g., piggy retinal patterns). Fodor (1990) addresses these indeterminacy problems by adding several conditions to his original account. He stipulates (i) that the mental symbol must be actually caused (not just that it would be caused) by the object or property (i.e., by pigs) and (ii) that the mental symbol has actually been caused by the wrong kinds of objects or properties (i.e., non-pigs) and thus that misrepresentation is not simply possible but that it has actually occurred. Adding these extra conditions, however, undermines the power of the account to explain mental content.

The key problem with accounts of mental content that depend on reliability conditions is the following: If a mental state *M* reliably represents *P* (e.g., pig), then *M* will also reliably represent the disjunction *P v Q* (e.g., pig or a bull terrier; pig or undetached pig part). After all, *P* and *P v Q* will be co-instantiated. The reliability relation does not cut finely enough to privilege *P* over the alternatives. In contrast to Fodor's asymmetrical causal dependence account, capacitism does not face these problems since it does not depend on the reliability of perceptual capacities.

7. The Repeatability Condition

A perceptual capacity must be repeatable. More precisely:

> *Repeatability Condition:* A necessary condition for C_α to be a perceptual capacity is that C_α is repeatable.

The repeatability condition implies that it must be possible to employ C_α in at least two distinct contexts for C_α to be a perceptual capacity. Now it might be that one possesses a perceptual capacity that one has—for whatever reason—employed only once, or indeed never. The requirement is not that one has in fact employed a perceptual capacity more than once, but that it is possible to employ that capacity in at least two distinct contexts. The contexts may differ in at least the following five ways.

One way is with regard to the particulars singled out. In one context, the perceptual capacity C_α can be employed to discriminate and single out the particular α_1; in another it can be employed to discriminate and single

out the particular α_2, where α_1 and α_2 are numerically distinct particulars each of which C_α functions to discriminate and single out.

Second, the contexts could differ with regard to whether the perceptual capacity is employed while fulfilling its function or employed while failing to fulfill its function. In one context, a perceptual capacity C_α can be employed while succeeding in singling out the particular α_1; in another it can be employed while failing to single out any particular.

Third, the contexts could differ with regard to the situational features that determine the conditions under which a particular is perceived—features such as lighting conditions, acoustic conditions or the angle and distance from which the particular is perceived. The perceptual capacity C_α can be employed to discriminate and single out the particular α_1 under distinct situational features.[19]

Fourth, the contexts could differ temporally. The perceptual capacity C_α can be employed to discriminate and single out the particular α_1 at time t_1 and at time t_2.

Fifth, the contexts could differ spatially. The perceptual capacity C_α can be employed to discriminate and single out the particular α_1 at location L_1 and at location L_2.

In each of these five ways in which the contexts could differ, the same perceptual capacity C_α can be employed in two distinct contexts. As these examples of distinct contexts show, the bar for a perceptual capacity to be repeatable is low.

Now it may be that at least some particulars are correlated with a unique perceptual capacity. This is plausible if one allows that perceptual capacities are quite high-level. Let's assume that Robin possesses a perceptual capacity to discriminate and single out his mother. This perceptual capacity will be individuated by exactly one particular in the world. Nonetheless, the perceptual capacity is repeatable. After all, Robin can employ his capacity to single out his mother today and also tomorrow.

Capacitism is neutral on whether perceptual capacities function to single out only low-level properties such as colors, shapes, sounds, smells and the like, or whether there are perceptual capacities that function to single out individual people, skyscrapers and pine trees as such. Nothing in the account presented in this chapter hinges on how the debate on whether perception represents only low-level properties or also high-level properties is resolved.

8. The Physical Base and Informational Base of Perceptual Capacities

We can analyze perceptual states at three distinct levels:

I. The mental state level
II. The information-processing, computational level
III. The physical, neural level

Employing perceptual capacities lies at the mental state level.[20] Computational states, events and processes (as well as any other subpersonal functional states, events and processes) that support mental states lie at the information-processing level. Neural networks and neural activity (as well as other biological or mechanical structures, states, events and processes) in which the other two levels are realized lie at the physical level.

What are the computational and neural underpinnings of employing perceptual capacities? What is the relation between mental states brought about by employing perceptual capacities and the non-mental states, events and processes in virtue of which they obtain? Any employment of a perceptual capacity has a physical base.

Physical Base Condition: If a subject *S* is employing a perceptual capacity C_α, then there is a physical base of employing C_α that is constituted by physical states, events and processes (such as the neural activity) of *S*.

The physical base condition allows for multiple realizability. So, the fact that employing perceptual capacities has a physical base does not imply an identity relation between employing a perceptual capacity and its physical base. Nor does it imply that there is an identity relation between the mental states constituted by employing perceptual capacities and the physical base of their employment.[21]

Any employment of a perceptual capacity has not only a physical base but also an informational base.

Informational Base Condition: If a subject *S* is employing a perceptual capacity C_α, then there is an informational base of employing C_α that is constituted by the subpersonal psychological mechanism (information processing, computations and other subpersonal functional states, events and processes) of *S*.

There are complex relations between the information-processing level and the physical level. After all, neural networks encode information. One central question is what the relation is (if any) between information-processing modularity and neural modularity—assuming here standardly, though not uncontroversially, that there are information-processing modules (Barrett and Kurzban, 2006; Evans and Frankish, 2009). Information-processing modules are informationally encapsulated, functionally specialized computational mechanisms that are dedicated to perceptual or cognitive tasks: Specific perceptual discrimination, biological classification, face recognition, to give just a few examples (Fodor, 1983; Coltheart, 1999; Barrett and Kurzban, 2006; Carruthers, 2006). Neural modularity is a claim about the relation between information-processing modules and physical neural networks, namely, that there is a one-to-one mapping between information-processing modules and locations of neural activity.

It has been argued that information-processing modules have localized neural bases and that evidence of neural modularity, and more specifically of neuroanatomical localization, is required to support claims

of information-processing modularity.[22] There is, however, compelling evidence that information-processing modularity does not entail physical neural modularity.[23] After all, information-processing modules are functionally characterized and could change over time—in response, for example, to damage (Segal, 1996). So, while at any given time there must be some neural structure (or analogous physical structure) that realizes each module's processing mechanism and establishes its informational connections with other subsystems, these structures could change.

Furthermore, distinct information-processing modules might be grounded in the same neural structures. As with any complex biological or informational systems, there may be considerable sharing of physical parts between information-processing modules (Carruthers, 2006). Moreover, given the flexibility of neural networks and physical structures more generally, any commitment to physical modularity should be rejected (Lloyd, 2011). Thus, there is good evidence that information-processing modules need not have localized neural bases and that neuroanatomical localization is not required to support claims of information-processing modularity (Frankish, 2009). And indeed, we can accept the physical base condition on the employment of perceptual capacities without endorsing any one-to-one mapping between information-processing modules and locations of neural activity.

What about the relation between the mental state level and the information-processing level? The view that perceptual states are constituted by employing perceptual capacities fits neatly with computationalism, according to which personal-level mental states are grounded in computational states. Now some reductive versions of computationalism have it that mental states are fully analyzable in computational terms. According to such views, personal-level mental states can be deduced from computational states, events and processes: Mental states simply are computational states at a certain stage of information processing.

We can accept that mental states are grounded in computational states, however, without endorsing such a reductive view. After all, states, events and processes on the mental level can be grounded in states, events and processes on the computational level even if no identity relations hold between the two levels. Accepting a grounding relation does not entail that personal-level mental states can be identified with or reduced to computational states, events and processes. Moreover, states, events and processes on the computational level can cause states, events and processes on the mental level even if no identity relations hold between the two levels. In short, mental states, events and processes can be grounded in, explained in terms of or obtain in virtue of computational states, events and processes without any identity relations holding between the two levels.

This approach allows us to accept the existence of states, events and processes on both levels and to understand vision science and the cognitive sciences, more generally, as investigating the metaphysical and

explanatory dependencies between the two levels. On this approach, the focus is not on whether there are identity relations between states, events and processes on the two levels but on the causal and grounding relations between the two (Strevens, 2004; Craver, 2007; Godfrey-Smith, 2008; Silva and Bickle, 2009; Craver and Darden, 2013). This allows us to acknowledge that an account of information processing is a necessary element of any complete account of perception, while also acknowledging that central questions, such as the nature and source of perceptual consciousness and the epistemic force of perceptual states, cannot be adequately addressed solely at the computational level.

As I have argued, employing perceptual capacities is grounded in subpersonal computational mechanisms and physical neural networks that encode information. Thus, capacitism entails that perceptual states can be scientifically explained in terms of informational and physical states, events and processes without thereby reducing perceptual states to those non-mental features. In this way, capacitism posits that perceptual states are genuinely mental yet can nonetheless be the object of scientific inquiry.[24]

9. The Generality of Perceptual Capacities

A perceptual capacity is general in that it can be employed to single out any particular of the type that the capacity functions to discriminate and single out. In the typical case, no specific particular needs to be singled out in any specific employment of a perceptual capacity.[25] Any particular will do, as long as it falls under the type of particulars that the capacity functions to discriminate and single out. For example, the perceptual capacity C_{square} can be employed to discriminate and single out any perceivable square object. In this sense, it is semantically general in much the way as the concept square is semantically general. Semantic generality should be distinguished from syntactic generality. While perceptual capacities are semantically general, they are syntactically singular: They function to single out particulars in the environment—not general kinds or universals. In this respect, they are akin to singular terms, such as demonstratives and indexicals. Not only are perceptual capacities syntactically singular but the perceptual states they yield are syntactically singular as well.

9.1 Perceptual Capacities and Modes of Presentation

By employing a perceptual capacity in perception, we single out a particular in a certain way. Let's say we are perceptually related to a triangle. We can single it out via its three-sidedness or via its three-corneredness. When we single it out via its three-sidedness we employ a different capacity than when we single it out via its three-corneredness. Similarly, when

we hear a cello in the midst of the cacophony of an orchestra, we can single it out in virtue of its rich timbre or its reverberating sound. When we see a ruby-red gemstone, we can single it out in virtue of its being red or in virtue of its being ruby-red.

As I have argued elsewhere, employing perceptual capacities constitutes perceptual content, and this content is structured by singular modes of presentation.[26] Employing perceptual capacities parallels Fregean modes of presentation both with regard to being ways of singling out particulars and with regard to the fact that any particular can be singled out by employing a range of different perceptual capacities.

The idea that content is constituted by employing perceptual capacities by means of which we (purport to) single out particulars is analogous to the Fregean idea that modes of presentation are a way of grasping or referring to particulars. A mode of presentation is the specific way in which a subject refers to a particular.

While Frege introduces the distinction between sense and reference with a perceptual case, he does not develop the notion for perceptual content. His focus was never on lowly mental faculties like perception. Nonetheless, we can apply his view of modes of presentation to the case of perception. Applied to that case, the idea is that a mode of presentation is the specific way in which a subject singles out a perceived particular. Insofar as perceptual capacities are ways of singling out particulars, they can be understood as the mental counterpart of Fregean modes of presentation: As a mode of presentation is a way of referring to an object, employing a perceptual capacity is a way of singling out a particular. Moreover, just as there is a many–one relation between senses and references, there is a many–one relation between perceptual capacities and particulars. And while a mode of presentation is a component of a thought or a proposition, a perceptual capacity is a mental tool. According to Frege, concepts are mappings from objects onto truth-values (Frege, 1879). Similarly, perceptual capacities are mappings from particulars onto accuracy conditions. Not only do perceptual capacities parallel modes of presentation in their role of singling out particulars, insofar as employing perceptual capacities constitutes perceptual states, but they have a certain cognitive significance. So like Fregean modes of presentations, perceptual capacities play the dual role of having a cognitive significance and being a means of singling out particulars.

One key motivation for introducing perceptual capacities and modes of presentation is to capture a fineness of grain in content that reference to mind-independent particulars alone could not achieve. Acknowledging that particulars are always singled out via employing perceptual capacities and grasped under modes of presentation makes room for the fact that any mind-independent particular can be represented in different ways. So any particular can be singled out via employing distinct perceptual capacities, and any particular can be grasped under different

modes of presentation. On a Russellian understanding, alternative possible modes of presentation can be expressed only insofar as one may have different cognitive attitudes to the same content. The way in which one perceives or thinks of the object is not expressed in the content proper. On the Fregean approach, every particular perceived will be represented under a mode of presentation.

Due to this, the Fregean view avoids counterexamples to Russellian representational views.[27] Consider a case in which you are looking at a page of graph paper, a page of symmetrically arranged tiles. You can see the tiles as being grouped. There are a number of ways the tiles can be grouped depending on which tiles are seen to be more prominent. Now let's say that at time t_1 you see one set of tiles as prominent and at time t_2 you see another set of tiles as prominent *ceteris paribus*. In such a case, there is no difference in the environment: The tiles perceived are exactly the same at t_1 and t_2. The only difference is how the mind groups the tiles.[28] Since there is no change in the environment to which you are perceptually related, it is not clear how a Russellian would account for the change in representational content. A Fregean has no problem dealing with such a case. A Fregean will say that you represent the tiles under different modes of presentation at t_1 and t_2.

A more general advantage of the Fregean approach is that it accounts for the fact that thought is fundamentally perspectival. Applied to perception, it accounts for the fact that perception is fundamentally perspectival—perspectival not only in that we perceive from a location and so in an egocentric frame of reference, but also in that we always perceive particulars under specific conditions (location, lighting conditions, acoustic conditions) with a specific set of perceptual capacities. There is always a way in which we discriminate and single out particulars in our environment. Consider Sasha, who hears jazz for the first time. When listening to John Surman's recording of "Doxology" for the first time, she will not discern much. As she becomes an expert, she will discern significantly more when listening to the very same recording. One explanation is that she develops more fine-grained perceptual capacities that allow her, for example, (1) to discriminate between the sound of the trumpet and the sound of the piano even when they are playing at the same time, and (2) to hear differences between chords. More radically, we can say that we cannot perceive a particular in our environment without perceiving it from our location with our specific perceptual capacities.[29] In this sense, we cannot perceive without being constrained by our perspective. The Fregean approach acknowledges this.

There are two standard ways of thinking about Fregean modes of presentation. If one focuses on the role of modes of presentation as accounting for cognitive significance, then it is natural to think of them as *de dicto*. A *de dicto* mode of presentation is general in that it can be the very same regardless of what (if anything) the experiencing subject is

perceptually related to. If, by contrast, one focuses on the role of modes of presentation as a way of referring to a particular, then it is natural to think of them as *de re*. A *de re* mode of presentation is singular in that what particular (if any) the subject is perceptually related to has repercussions for the token content.

A *de dicto* mode of presentation lays down a condition that something must satisfy to be the particular determined by the content. Chalmers, among others, understands Fregean senses in this way: "Fregean content is supposed to be a sort of phenomenal content, such that, necessarily, an experience with the same phenomenal character has the same Fregean content" (2006: 99, see also Thompson, 2009). A *de dicto* mode of presentation constitutes a way of representing mind-independent particulars irrespective of whether the relevant particulars are present. If the content of experiential states were constituted by *de dicto* modes of presentation, then the content of a perception, a hallucination or an illusion with the same phenomenal character would be

$$(e_{p,h,i}) <MOP_d^{o}, MOP_d^{F}>$$

where MOP_d^{o} is a *de dicto* mode of presentation of an object and MOP_d^{F} is a *de dicto* mode of presentation of a property. Such an account of perceptual content implies a two-stage view of determining reference: First, we represent a general content and in a second step, we refer to mind-independent particulars based on this content.[30] Representing a *de dicto* mode of presentation is, on this view, independent of the second step, in which a particular may be determined. Such a two-stage view faces the problem of how the content grounds the ability to refer to external particulars. Insofar as a *de dicto* mode of presentation can be the very same regardless of what (if anything) the experiencing subject is perceptually related to, this way of thinking about content amounts to a version of austere representationalism and faces all the difficulties of that view. Any view on which perceptual content is constituted by *de dicto* modes of presentation fails to satisfy the particularity desideratum for the same reasons that austere representationalism does.

This problem is avoided if perceptual content is analyzed as constituted by *de re* rather than *de dicto* modes of presentation. Understanding modes of presentation as *de re* is motivated by recognizing that modes of presentation play a dual role: They have a cognitive significance and they single out or refer to mind-independent particulars. Understanding perceptual content as constituted by *de re* modes of presentation recognizes that representing a particular is not independent of singling out the particular that is the referent of the sense. By contrast to *de dicto* modes of presentation, *de re* modes of presentation are singular in the good case.

Now on one way of understanding *de re* modes of presentation, a subject can have a contentful experience only if she is (perceptually)

related to the very particular that she purports to single out. This view is a version of content disjunctivism.[31] One problem is that the cognitive significance and the action-guiding role of experiential content is downplayed. When a subject hallucinates, the way things seem to her plays a certain cognitive role. If it seems to her that she is perceptually related to a white cup, she may, for example, reach out and try to pick it up. If one denies that hallucinations have representational content, this cannot be explained. It is not clear how the mere illusion of content could motivate the subject to act. Consider Harman's example of Ponce de Leon who was searching Florida for the mythical Fountain of Youth (Harman, 1990). The Fountain of Youth does not exist, yet Ponce de Leon was looking for something particular. As Harman argues convincingly, he was not looking for a mental object. He was looking for a mind-independent object that, as it so happened, unbeknownst to him, did not exist. A second problem—and the problem most salient for present purposes—is that, insofar as content disjunctivists hold that hallucinations do not represent, they leave unclear what explains the phenomenal character of hallucinations. So it is not clear how content disjunctivists satisfy the phenomenal sameness desideratum. While content disjunctivists acknowledge that a hallucination could seemingly have the same phenomenal character as a perception, they do little if anything to explain this phenomenon.

The problems of disjunctivism are avoided if perceptual content is not understood as radically object-dependent. That would allow that hallucinations can have at least some kind of content. One way to develop such a view is to argue that the content of a hallucination involves a gap that in the case of a perception is filled by a particular.

Recall that in Section 1, we distinguished between three levels at which to analyze mental states. The first level of analysis pertains to the function of the mental capacity. The second level of analysis pertains to the mental capacity employed, irrespective of the context in which it is employed. The third level of analysis pertains to the mental capacity employed, taking into account the context in which it is employed. Applied to the notion of perceptual content, we can say that the second level of analysis pertains to the content type of a mental state, while the third level of analysis pertains to the token content of a mental state. The content type and the token content are both constituted by capacities that have a certain function. So the first level of analysis explains how the content type and the token content are connected beyond the one being a token of the other.

Harnessing this distinction, we can say that there is a content type that is constituted by the perceptual capacities employed. Consider the case in which a subject, let's call her Miriam, employs two perceptual capacities, one that functions to single α particulars and one that functions to single out π particulars. Let's say α particulars are cups α_1 and the π particulars

are instances white. In such a case, the content type of the perceptual state brought about by employing these two capacities will be:

$$(\text{content}_{\text{Type}}) <\text{MOP}_{r\alpha}[\_\_\_], \text{MOP}_{r\pi}[\_\_\_]>$$

where $MOP_{r\alpha}[\_\_\_]$ is a content type that is constituted by employing the perceptual capacity C_{α} that functions to single out particulars α_1, α_2, α_3, . . . α_n; and $MOP_{r\pi}[\_\_\_]$ is a content type that is constituted by employing the perceptual capacity C_{π} that functions to single out particulars π_1, π_2, $\pi_{3,\ldots}$ π_n. If in employing the perceptual capacity C_{α} the particulars α_1 is singled out, then the token content of the perceptual state will be $MOP_{r\alpha}(\alpha_1)$. If in employing the perceptual capacity C_{α} the particulars α_2 is singled out, then the token content of the perceptual state will be $MOP_{r\alpha}(\alpha_2)$. If in employing the perceptual capacity C_{α} no particular is singled out, then the token content of the perceptual state will be $MOP_{r\alpha}(\_\_)$. So the content type $MOP_{r\pi}[\_\_\_]$ can be tokened by $MOP_{r\alpha}(\alpha_1)$, $MOP_{r\alpha}(\alpha_2)$ and $MOP_{r\alpha}(\_\_)$.

Let's say Miriam sees a white cup and so singles out α_1 by employing C_{α} and π_1 by employing C_{π}. In this case, the token content of her perceptual state will be:

$$(\text{content}_{e1}) <\text{MOP}_{r\alpha}(\alpha_1), \text{MOP}_{r\pi}(\pi_1)>$$

where $MOPr_{r\alpha}(\alpha_1)$ is a singular mode of presentation of the cup α_1 that is the product of employing a perceptual capacity that functions to single out the kind of object under which α_1 falls. So "α_1" is functioning as the name of an object. "$MOPr_{r\alpha}$" is a functional expression that expresses a function from objects to singular modes of presentation. $MOP_{r\pi}(\pi_1)$ is a singular mode of presentation of the property-instance π_1 that is the product of employing a perceptual capacity that functions to single out instances of the property under which π_1 falls. So while $MOP_{r\alpha}(\alpha_1)$ is a *de re* mode of presentation of the object α_1, $MOP_{r\pi}(\pi_1)$ is a *de re* mode of presentation of the property-instance π_1.

Now let's say that Miriam hallucinates a white cup. In this case, the token content of her hallucinatory state will be:

$$(\text{content}_{h}) <\text{MOP}_{r\alpha}(\_\_), \text{MOP}_{r\pi}(\_\_)>$$

where $MOP_{r\alpha}(\_\_)$ specifies the kind of object that would have to be present for the experience to be accurate, and $MOP_{r\pi}(\_\_)$ specifies the properties that this object would instantiate were the experience a perception rather than a hallucination. More specifically, $MOP_{r\alpha}(\_\_)$ is a gappy mode of presentation that is the product of employing a perceptual capacity that functions to single out objects of the kind that the hallucinating subject purports to single out while failing to single out any such

object. It accounts for the intentional directedness of the experience at a (seeming) particular object. $MOP_{r\pi}(\_\_)$ is a gappy mode of presentation that is the product of employing a perceptual capacity that functions to single out property instances of the kind that the hallucinating subject purports to single out while failing to single out any such property-instance. It accounts for the intentional directedness of the experience at a property-instance. In short, $MOP_{r\alpha}(\_\_)$ is a gappy, object-related mode of presentation and $MOP_{r\pi}(\_\_)$ is a gappy, property-related mode of presentation. So for a perceptual capacity to be employed baselessly amounts to the ensuing token content being gappy. There is nothing metaphysically spooky about gaps. The gap simply marks the failure to single out a particular. Both Miriam's hallucinatory state and her perceptual state are characterized by: [32]

$$(\text{content}_{\text{Type}}) <\text{MOP}_{r\alpha}[\_\_\_], \text{MOP}_{r\pi}[\_\_\_]>$$

9.2 *Perceptual Capacities, Concepts and Nonconceptual Content*

A perceptual capacity can be understood either as a conceptual or a nonconceptual capacity. Which stance one takes will depend largely on how one understands the nature of concepts and their possession conditions. Depending on how concepts are understood, it is more or less plausible to think of perceptual content as conceptually structured. For this reason, the debate over whether perceptual content is conceptual or nonconceptual is almost entirely terminological. One of the advantages of analyzing perceptual states (and, as I will argue, perceptual content) as constituted by employing perceptual capacities is that it allows us to sidestep the issue of whether perceptual content is conceptual or nonconceptual.[33]

Concepts have been understood in terms of mental representations, stereotypes, functional roles and inferential roles, to name just a few standard views. Nonconceptual content has been understood in terms of image-like or map-like representations, as constituted by employing nonconceptual, perceptual capacities, or in terms of the idea that we represent, naked properties and objects.

If concept possession requires the ability to draw inferences, then it is wildly implausible that the capacities employed in perception are conceptual capacities.[34] After all, perception is a low-level mental faculty that we share with animals that have no inferential capacities. This implies that, if concept possession requires the ability to draw inferences, then it cannot be the case that all perceptual capacities are conceptual capacities. If, on the other hand, it is held that all perceivers possess concepts—even perceivers that have no inferential abilities or any other such high-level cognitive abilities—then it is more plausible that perceptual capacities are conceptual capacities. On such a view of concepts, the requirements for

concept possession are cognitively so minimal that it becomes unproblematic to say that a honeybee possesses concepts and hence unproblematic to say that perceptual capacities are conceptual.

While the debate on whether perceptual content is conceptual or nonconceptual is almost entirely terminological, there are elements of the debate that are not terminological. Focusing on those elements, I argue that perceptual content is nonconceptual. The key motivations are to accommodate the fact that at least some aspects of perceptual content can be image-like or map-like and moreover to account for the richness and fineness of grain of perceptual experience.[35]

If perceptual content is constituted by employing such nonconceptual capacities, then perceptual content is nonconceptual. The thesis that perceptual content is constituted by employing perceptual nonconceptual capacities gives a substantive analysis of the nonconceptual content of perception.

The thesis that perceptual content is nonconceptual is supported by the fact that on standard views of concepts, perceptual experience is richer and more fine-grained than our concepts. For example, the shades of color a perceiver is able to discriminate in perception are typically significantly more fine-grained than her color concepts. If that is right (and on most notions of concepts it is), then richness and fineness of grain of perceptual experience supports the thesis that perceptual content is nonconceptual.

Additional evidence is provided by the fact that non-rational animals perceive. If non-rational animals do not possess concepts, then perceptual capacities cannot necessarily be conceptual. As mentioned, however, whether this additional evidence has any force depends on the notion of concept with which one is operating.

The conceptualist might object that if singular thoughts or perceptual beliefs inherit their content from perception, then perceptual content must have the same structure as the content of belief. If that is right, then perceptual content must be conceptual rather than nonconceptual. In response, the nonconceptualist can say that such beliefs can be based on perception without their content being exactly like perceptual content. After all, the fact that perceptual beliefs are based on perception does not imply that perceptual content is conceptual. While it is plausible that at least some elements of perceptual content are similar to the content of a belief based on that perception, the similarity need not be a matter of both mental states having conceptual content.

The conceptualist might object further that only something that is conceptually structured can justify beliefs; so, if perceptual experience justifies beliefs, then perceptual content must be conceptually structured. In response, the nonconceptualist can say that all we need for experience to play a justificatory role is that its content is propositionally structured. But content can be propositionally structured without being conceptually

structured. Moreover, there are reasons to question whether something must be propositionally structured in order to provide evidence.

In sum, there is good reason to understand perceptual content and perceptual capacities as nonconceptual. The thesis that perceptual content is constituted by employing perceptual capacities allows for a substantive way of analyzing perceptual content as nonconceptual. However, the thesis is also compatible with understanding (at least some) perceptual capacities as conceptual capacities. Indeed, one of the benefits of analyzing perceptual content as constituted by perceptual capacities is that it allows one to sidestep the largely terminological debate over whether perceptual content is conceptual or nonconceptual.

10. Coda

I have developed an asymmetric counterfactual analysis of perceptual capacities. The asymmetry stems from the primacy of the employment of perceptual capacities when the capacities fulfill their function over their employment when they fail to fulfill their function. The analysis is counterfactual, since (subtleties aside) one qualifies as possessing a perceptual capacity only if one would be in a position to discriminate and single out a particular of the type that the capacity functions to single out, were one perceptually related to such a particular. Moreover, the analysis is externalist insofar as capacities are individuated by the external, mind-independent particulars that they function to discriminate and single out.

Notes

1. See Cummins, 1985 for a good overview.
2. There are notable exceptions. See, for example, Cartwright, 1994 and Sosa, 2010.
3. For discussion, see Hawthorne and Manley, 2012.
4. For this reason, the account of capacities developed here does not face Dennett's (1991) indeterminacy worries.
5. For a critical discussion of etiological accounts of function, see Nanay, 2010. As Nanay argues, such accounts are circular.
6. Schellenberg, 2013, 2017.
7. For discussions of the role of pre-attentive discrimination in perception, see Julesz, 1981, Watson and Robson, 1981, Sagi and Julesz, 1985, Malik and Perona, 1990, Krummenacher and Grubert, 2010 and To, Gilchrist et al., 2011.
8. Accepting this is compatible with holding that perceptual knowledge results from the exercise of cognitive capacities operating on inputs received from perception. However, in Part III, I will develop a view of perceptual knowledge that does not put any such intellectualist conditions on perceptual knowledge.
9. I am here following Byrne and Hilbert (2003) in treating color properties, and similar such properties, as external, mind-independent intrinsic properties. My argument, however, easily generalizes to alternative views of color

as long as there are external, mind-independent properties, such as reflectance properties or wavelength emittence properties, that form the basis for perception of colors.

10. For a development of the notion of situation-dependent properties, see Schellenberg, 2008. For critical discussions, see Cohen, 2010 and Jagnow, 2012.
11. For a discussion of masking, see Johnston, 1992; for a discussion of finking, see Martin, 1996.
12. For the distinction between "might"-conditionals and "would"-conditionals, see Lewis, 1973: 21–24. For a discussion of "could"-conditionals, including a discussion of whether they are in fact conditionals, see Austin, 1970: 211–213. See also DeRose and Grandy, 1999.
13. For discussions of this set of issues, see in particular Li et al., 2004, 2009, Scott et al., 2007. See also Luna et al., 2005, de Lafuente and Romo, 2005, Chowdhury and DeAngelis, 2008, Law and Gold, 2008, Kahnt et al., 2011.
14. See Caston, 2002 for a helpful discussion. Thanks to Victor Caston for helpful exchanges on Aristotle's view of capacities and powers.
15. For distinctions analogous to the distinction between employing a capacity and possessing a capacity, see Schellenberg, 2007, Glick, 2012, Vihvelin, 2013 and Whittle, 2010.
16. Thanks to Matt McGrath for raising this question.
17. For a defense of this idea, see Schellenberg, 2018a.
18. For a helpful discussion of asymmetry arguments, see Marušić, 2016.
19. For a discussion of situational features, see Schellenberg, 2008.
20. I use "mental" to refer to personal-level states, events and processes and "information processing" to refer to states, events and processes that are at a subpersonal level. To avoid terminological confusions, it is important to note that some have used "mental" to refer to states, events and processes at the subpersonal, computational level (see e.g., Fodor, 1975).
21. The locution "of the subject *S* who is employing C_α" in the physical base condition need not be understood as implying that the physical base is a biological component of *S*. The physical base could be an implant.
22. For discussion, see Fodor, 1983 and Panksepp and Panksepp, 2001. Note that they use the terminology of mental modules rather than information-processing modules. For a helpful discussion of modularity, see Toribio, 2002.
23. For general discussion, see Koch et al., 2016.
24. For helpful discussions of computational accounts of perception, see Egan, 1992 and Cohen, 2010.
25. Exceptions are perceptual capacities that function to single out one unique particular, such as Robin's perceptual capacity to single out his mother.
26. Schellenberg, 2011.
27. See, for example, Neander, 1998; Macpherson, 2006 and Nickel, 2007.
28. For a discussion of this case, see Nickel, 2007.
29. For an excellent discussion of how best to understand the mental capacities we bring to bear in perceptual experience, see Speaks, 2005.
30. For an argument against such a two-stage view of determining reference, see Johnston, 2004: 150f. Johnston does not distinguish between *de dicto* and *de re* modes of presentation, and as a consequence sees the problem articulated in the main text as a problem for any Fregean view *tout court*. As I will show, it is only a problem for a view on which Fregean senses are *de dicto* rather than *de re*.
31. For a defense of such a view, see Evans, 1982 and McDowell, 1984.
32. Schellenberg, 2018b.

33. For discussion of nonconceptual content, see Peacocke, 1998; Heck, 2000 and Speaks, 2005. For recent arguments for the idea that perceptual content is conceptually structured, see Glüer-Pagin, 2009 and Bengson et al., 2011.
34. For a view on which possessing concepts requires inferential capacities, see Brandom, 1994.
35. The key arguments in this book can, however, be accepted if perceptual capacities are understood as conceptual rather than as nonconceptual capacities.

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