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Abstract: I propose a new criterion by which, I hold, subjects recognize and distinguish their sensory modalities. I argue that, rather than appealing to one of the standard criteria (sense organ, proximal stimulus, phenomenal character, or representational content (Grice 1962, Macpherson 2011a)) or to O'Dea's (2011) proprioceptive content, we need to introduce the criterion of location in the functional architecture of the subject's personal-level mind in order to make sense of an ordinary subject's ability to tell immediately which sensory modalities are employed in her occurrent perceptual experience. More specifically, a subject's personal-level mind is functionally organized into different faculties, and, seeing as it is her mind, she has a natural cognitive access to this structure; in the specific case of perceptual experience, perceptual input from the world is present to the subject as organized into the different sensory modalities, vision, hearing, touch, taste, and smell. I motivate and explicate my new criterion for distinguishing the senses, in particular its psychological aspects. Moreover, I show how it can handle problems raised by empirical findings, such as additional human senses (e.g. the vomeronasal sense) and cross-modal experiences (e.g. the experience of a speaker's voice emanating from his mouth)

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How We Know Our Senses

Eva Schmidt

I propose a new criterion by which, I hold, subjects recognize and distinguish their sensory modalities. I argue that, rather than appealing to one of the standard criteria (sense organ, proximal stimulus, phenomenal character, or representational content (Grice 1962, Macpherson 2011a)) or to O'Dea's (2011) proprioceptive content, we need to introduce the criterion of *location in the functional architecture of the subject's personal-level mind* in order to make sense of an ordinary subject's ability to tell immediately which sensory modalities are employed in her occurrent perceptual experience. More specifically, a subject's personal-level mind is functionally organized into different faculties, and, seeing as it is *her* mind, she has a natural cognitive access to this structure; in the specific case of perceptual experience, perceptual input from the world is present to the subject as organized into the different sensory modalities, vision, hearing, touch, taste, and smell. I motivate and explicate my new criterion for distinguishing the senses, in particular its psychological aspects. Moreover, I show how it can handle problems raised by empirical findings, such as additional human senses (e.g. the vomeronasal sense) and cross-modal experiences (e.g. the experience of a speaker's voice emanating from his mouth).

1. How to Distinguish the Senses: The Traditional Criteria

In their investigations, philosophers of perception tend to focus on visual perceptual experience. By comparison, the non-visual sensory modalities (hearing, touch, taste, and smell) are usually, albeit undeservedly, neglected. One important question concerning the senses that has recently attracted more attention is the question of how to individuate the senses. Locus classicus of the corresponding debate is Grice's (1962) paper 'Some Remarks about the Senses', where he discusses the following four criteria by which our sensory modalities may be distinguished.¹

- (A) The sense organ that is involved in a particular sensory modality.
- (B) The proximal stimuli relevant to the sensory modality.
- (C) The specific phenomenal character associated with the sense.
- (D) The properties typically represented by the sense.

For hearing, for instance, the criteria in question would be (A) the ear, plus the nerves and brain areas involved in processing input coming from the ear, (B) sound waves, (C) a particular auditory phenomenal character, and (D) sounds and their properties.

In what follows, I will focus on one specific version of the individuation question and argue that it cannot be answered satisfactorily by appeal to any of these criteria. The question I want to focus on is: How can (and do) normal perceivers individuate their sensory modalities in the act of perceiving? For instance, how can Gertrude know that she sees the roundness of the coin, rather than feeling it? This is an epistemological question (concerned with our self-knowledge of our sensory modalities). Note that this kind of knowledge seems so natural that it is (at least initially, see below) difficult to think of a scenario in which a subject might be wrong or unjustified in her beliefs about the sensory modality of her occurrent perceptual

¹ Another very helpful discussion of these criteria can be found in Macpherson (2011).

experiences. In this respect, it is similar to a subject's knowledge of the phenomenal character of her experiences – it is hard to come up with an example in which a subject is mistaken in her beliefs about the phenomenal character of one of her experiences.²

A very closely related psychological question will also become relevant in what follows. This is the question of how ordinary perceivers are able to form their immediate introspective judgments about the sensory modalities of their occurrent perceptual experiences. It is a question concerning the mechanism by which perceivers can form such introspective statements, which is neutral on the epistemological issue of whether these judgments constitute knowledge.

I will leave to one side a further question in the vicinity, viz. the question of the criteria by which scientists should best distinguish the different senses. I will not make claims about how scientists might best taxonomize sensory modalities. This kind of project is quite different from the one I will pursue here. It is not primarily concerned with a perceiver's self-knowledge or her immediate introspective judgments concerning her occurrent perceptual experiences. It plausibly has to take into account additional human senses (such as equilibrioception) and senses of other animals (such as bat echolocation).³

Here is why the aforementioned criteria cannot provide an answer to my question. (A) cannot work because of counterexamples such as the following: When cold water enters my ear, I perceive that the water is cold. The simple sense organ criterion would wrongly classify this as an auditory experience of hearing the cold. Ordinary perceivers do not make this mistake – they know that they are detecting something cold with their sense of touch. On the other hand, it is futile to appeal to the nerves and brain areas relevant to processing information coming in through the ear, for the self-knowledge of normal subjects about their sensory modalities is clearly independent of their knowledge of nerves and brains.

The same is true for criterion (B). Gertrude will be able to know that she feels rather than sees the roundness of the coin even if she is ignorant of the fact that, say, light waves are the proximal stimuli relevant to her sense of vision.

The phenomenal criterion (C), on the other hand, is quite promising as far as its accessibility to ordinary perceivers is concerned. One might suggest that Gertrude knows that her experience of the roundness of the coin is a tactile experience because of its tactile phenomenal character, which she simply could not confuse with any other phenomenal character. However, the problem with this option is that this supposed modality-specific phenomenal character is hard, if not impossible, to pin down.

The following objection is due to Grice (1962). If we try to explicate the phenomenal difference between Gertrude's visual experience and her tactile experience of the roundness of the coin, we end up describing a difference in the external objects and their properties that Gertrude's experiences present her with. For instance, we might end up saying that Gertrude sees the colour and shininess of the coin, but she feels its warmth and heaviness. This is a kind of transparency argument: All that seems to be left of the difference in phenomenal character between a visual and a tactile experience of the coin is a representational difference, which takes us to criterion (D), the representational criterion.

It seems plausible enough that, between two different sensory modalities, there is always a difference with respect to the total properties represented by them. In the coin example, colour is represented by sight, but not by touch; on the other hand, warmth is represented by touch, but not by sight. Yet, focussing on my question concerning a normal perceiver's knowledge of her sensory modalities, it seems wrong to say that she has to go through the list

² I will address potential examples of mis-individuation of perceptual experiences in the objections section.

³ The point of the traditional four criteria is (mainly) to provide an account of what makes a certain sensory modality the sensory modality it is – they fit best with a *metaphysical* project of individuating the senses.

of properties represented by a specific perceptual experience before she can determine which kind of sensory experience she is undergoing. Quite the contrary, a subject's awareness of which sense she is employing in perceiving certain external properties seems to be more basic than her awareness of all the different kinds of properties she is perceiving in that sensory modality.

To put it somewhat differently, according to the representational criterion, it looks as though a perceiver has to infer which sensory modality she employs in undergoing a perceptual experience from her knowledge of what properties out there she perceives. Such an account cannot do justice to the immediacy and non-inferentiality of a perceiver's knowledge of the sensory modalities of her occurrent perceptual experiences.

These four criteria, then, are unsatisfactory. Another, more promising criterion has been proposed by O'Dea (2011). Perceivers know the sensory modalities of their occurrent perceptual experiences because each sense represents itself, as a body part to be used to explore the environment, along with features of the environment. O'Dea claims that subjects know which sense they are employing because perceiving is partly proprioceptive, i.e., a perceptual experience represents not merely external objects and properties, but also which sense organ is used in undergoing the experience. In particular, each sense represents itself as a tool to explore the environment.

One way to put his proprioceptive criterion is to say that perceivers know which sensory modality they are employing via

- (E) The sense organ proprioceptively represented by the perceptual experience.

This view faces at least three problems. The first is that it is simply implausible that a perceptual experience represents not only things out in the subject's environment, but also, on a par with this, that a certain sense organ is being used. When Gertrude sees *the coin*, she does not also see that *she is seeing the coin*.

The second problem is a consequence of the assumption that the sensory modality is represented on a par with features of the environment: Perceptual misrepresentation of environmental features is widespread, so we should expect that there is also widespread misrepresentation of the sensory modality employed. But not so – as I mentioned before, it is hard to come up with examples of subjects' mistaken judgments of the sensory modalities of their occurrent perceptual experiences. This is to say that, on O'Dea's proprioceptive proposal, this kind of misrepresentation is a very rare occurrence.

The third problem is that perceivers have immediate knowledge of which sensory modalities they are employing. They do not have to figure out which sense they are using in a perceptual experience by first sorting through their perceptual contents to find out which sensory modality is represented proprioceptively. For instance, Gertrude knows that she sees the coin (rather than feeling it) immediately, without first having to sift through the content of her visual experience, all the while trying to figure out whether there is a proprioceptive representation of her eye (rather than her skin) included in it.

2. My Proposal

First off, let me provide a brief diagnosis of why individuation criteria (A) – (E), that have been proposed to provide an account of how ordinary perceivers can individuate their sensory modalities in the act of perceiving, have failed. Their problem is that they cannot respect the following features of our judgments about our sensory modalities:

- (1) These judgments are immediate.
- (2) These judgments are non-inferential.

(3) These judgments are (or at least appear to be, intuitively) incorrigible.

A better individuation criterion should respect these features of our judgments about the sensory modalities of our occurrent perceptual experiences. In this section, I will propose a new individuation criterion and argue that it can do justice to the aforementioned features of our judgments about our sensory modalities.

Here is my proposal. A perceiver can tell that she has a perceptual experience in a certain sensory modality because, in undergoing a certain perceptual experience, it is not just the perceptual content that is immediately available to her, but also the perceptual state (including its sensory modality) whose content it is. We might say that perceptual experience is a package deal: The personal-level availability of a certain perceptual content goes along with the availability of the perceptual state (be it a visual, a tactile, an auditory, a gustatory, or an olfactory state) that it is a content of.

Her perceptual states, including their sensory modality, are accessible to the perceiver as part of her overall access to the functional organization of her personal-level mind. To the subject, mental content is present as structured into different faculties, e.g. the perceptual faculties (or 'channels'). Functionally speaking, the senses are the mental faculties that convey different kinds of information about the subject's immediate environment with the purpose of action guidance and belief formation. Cognitively to access a certain perceptual content via a particular sensory channel is cognitively to access the functionally individuated sensory channel through which the perceptual content enters the personal-level mind. So, on my proposal, the subject knows the sensory modalities of her occurrent perceptual experiences thanks to

(F) The availability, to her, of the perceptual content's *'perceptual channel' in the personal-level functional architecture of her mind.*

To put this in terms of the example of feeling vs. seeing the roundness of a coin, Gertrude knows that she sees the roundness of the coin (rather than feeling it) because this visual content is available to her as the content of a visual experience, not of a tactile experience. The visual experience is present to her in terms of her visual faculty's particular functional significance in the overall functional architecture of her personal-level mind.

Note that my claim is not that this access to a perceptual state in terms of its functional significance translates to the perceiver's awareness of a certain kind of phenomenal character attached to the perceptual experience that is characteristic of the sensory modality in question. My claim is that subjects have an immediate access to how their minds are organized (at the personal level, of course), and to the channels through which mental content enters their personal-level minds. I hold that this is a kind of access that is not even mediated by a phenomenal character.

To return to the example, Gertrude knows that she is seeing rather than feeling the roundness of the coin not because of elements of the content of her visual experience, nor because of its specific phenomenal character, but because she has direct access to the functional organization of her personal-level mind. She has access to the fact that the information about the coin is coming in through the visual channel rather than the tactile channel.

The more general question in the vicinity is how a subject can ever tell that she believes something rather than desiring it, that she imagines something rather than remembering it, or that she perceives something rather than entertaining it as a thought. My suggestion is that, as a matter of functional structure, the personal-level mind is organized into different faculties, such as memory, belief, or perception. Perception, in its turn, is organized into the different perceptual channels of sight, hearing, touch, smell, and taste.

This structure echoes the functional structure of the sub-personal mind, where, for instance, it is organized into the respective perceptual systems. The subject has direct cognitive access

to the personal-level functional structure – this should come as no surprise, since it is her own mind. This, I want to suggest, is how she can tell that she is not remembering that the coin is round, nor wishing that the coin were round, nor imagining that it is round, but that she is perceiving, via her sense of vision, that the coin is round. To do so, she does not have to take any detours, for instance through a phenomenal character or through a content representing the sensory modality. She has simply cognitively to access the functional organization, and in particular the sensory channel through which a certain perceptual content enters her personal-level mind.

Let me add one clarificatory note. One may wonder whether the subject, in order to grasp the sensory modality of a particular perceptual experience, has to possess concepts pertaining to the functional role of states in that sensory modality. The idea would be that in order to gain knowledge of the sense modality of a certain perceptual experience, the subject has to exercise her concepts concerning the functional significance of the sense in question (e.g. that it is a sensory modality that deals with distal stimuli at a distance, that it takes light waves as its input, that it typically leads to this or that kind of belief, that it involves processing in the visual input module, etc.).

Let me emphasize that this is not the view that I am advocating. It would lead us back to the criteria that I have criticized above. Rather, my view is that the personal-level mind has a certain functional organization, and that this organization presents itself to the subject just as naturally as the mental content that enters the mind through the described perceptual ‘channels’. To the ordinary subject, perceptual content simply comes organized into the different sensory modalities.⁴

My proposal is motivated, first, by the fact that none of the other criteria provides a satisfactory account of perceivers’ self-knowledge of the sensory modalities of their occurrent perceptual experiences.

Second, my proposal does justice to the features of our judgments concerning our sensory modalities enumerated above. On my view, it is unproblematic to admit that our judgments of the sensory modalities of our occurrent perceptual experiences are immediate, non-inferential, and incorrigible. Our knowledge of our sensory modalities is immediate, for it is part of our direct introspective accessibility of the functional organization of our own minds. It is non-inferential because, on my account, we do not infer to judgments about our sensory modalities from, e.g., the phenomenal character or aspects of the content of our perceptual experiences. It is (possibly, problems for this see below) incorrigible because our direct awareness of the functional structure of our own personal-level minds does not leave a lot of room for error.

As a third point in favour, I might add that this kind of immediate access to the functional organization of one’s personal-level mind, and thereby to the mental states that bear certain contents, makes sense from an evolutionary perspective as well. To see this, imagine the perceiver being confused over whether she *remembers* seeing a tiger in front of her, or whether she is *currently seeing* a tiger in front of her.

My account has both psychological and epistemological dimensions. The psychological dimension is that there actually is a functional organization of our personal-level minds as described, to which we have direct cognitive access, and from which our confidence in our knowledge of our sensory modalities is derived. The epistemological dimension concerns the question of whether this access constitutes knowledge to match this confidence. In what follows, I will mostly focus on the psychological issue.

⁴ But which concepts does the subject employ in judging that she is undergoing an experience in this or that sensory modality? I am not sure as to the best answer to this question, but generally speaking, the options that are open to me here are similar to the ones exploited by defenders of phenomenal concepts in the qualia debate. For instance, our concepts of our own sensory modalities might plausibly be recognitional or demonstrative concepts.

3. Objections

I will discuss two problems for my account that result from recent research in cognitive science. The first problem is raised by senses that ordinary perceivers have, but know nothing about, such as the vomeronasal sense or equilibrioception. I claim that we can know our senses via our immediate cognitive access to the functional structure of our minds. How does this fit with scientists finding senses in humans that we know nothing about introspectively?

One clear example of this is the vomeronasal sense. In the human nose, there is a sense organ that detects pheromones and thereby helps control sexual behaviour. We have no immediate cognitive access to this sense – we are not conscious of the fact that our sexual behaviour is influenced by a pheromone detector in the nose, nor can we become aware of this fact by merely introspecting our sensory modalities. It seems, then, that the vomeronasal sense is a counterexample to my claim that we have direct cognitive access to our perceptual modalities.

Reply: I concede that not every channel through which we gather information about the environment registers as a distinct personal-level perceptual channel. In the case of the vomeronasal sense, we often just find ourselves being attracted to certain people, without being able to notice that there is something like a sensory modality involved informing us that someone is sexually attractive.

Take a different case, equilibrioception. Our sense of balance is a sense that we take note of only when we lose our balance, for instance by spinning until we get dizzy. Otherwise, this sensory modality does not seem to register as an independent personal-level sensory channel. Again, I concede that this is a plausible example of a sensory modality that does not make itself known as a distinct sensory channel in the functional architecture of our personal-level minds.

It is not problematic for me to admit this, for I am not in the business of making metaphysical claims about what makes something a particular sensory modality. Rather, I am in the business of explaining how we make our everyday judgments about the sensory modalities of our occurrent perceptual experiences (a psychological question), and of how we can have the corresponding everyday knowledge of our sensory modalities (an epistemological question). For these projects, there is no threat if there are other candidates for sensory modalities that we have no immediate introspective knowledge of. The most I am committed to, seeing as I am trying to argue that we can have immediate knowledge of our senses, is that the senses that we can cognitively access as personal-level sensory channels generally are as they appear. I hold that we are the authorities with respect to those sensory modalities that we can become aware of immediately (as I have proposed).

The second problem is that my proposal may seem to be threatened by the possibility of cross-modal experiences. For instance, scientific findings suggest that we perceptually experience voices as coming from the moving mouths of speakers because of a combined use of hearing and vision. This is why ventriloquists can apparently ‘throw’ their voices and why it is confusing to watch a movie in which the timing of the movements the speakers’ mouths does not match their voices.

These findings apparently constitute counterexamples to my claim that there is a distinct personal-level channel for each of our sensory modalities, a channel about which we can form immediate and incorrigible introspective judgments. It appears that we are regularly mistaken about which sensory channel is relevant to a certain perceptual experience, for we would classify hearing a speaker’s voice as an auditory experience, not as a cross-modal experience involving vision.

There are other cases in the same vein. The spicy flavour of chilies is detected, in part, by pain receptors on the tongue. Plausibly, we cannot tell this by introspectively accessing our experience, for tasting chilies appears to be an exclusively gustatory experience. Similarly, the

rich flavour of a tomato sauce appears to be a matter merely of our sense of taste, when in reality, it is partly due to sensors in the nose and thus partly based on our sense of smell.

Reply: Cases in which we do not notice the arguable cross-modality of our sensory experiences lead us back to the question of what individuates a perceiver's sensory modalities, metaphysically speaking. One option is to take the hard line with respect to this question and insist that what makes a perceptual experience the kind of perceptual experience it is is how it strikes me: I am the authority on the sensory modality of my occurrent perceptual experiences. If an experience of a speaker's voice strikes me as an auditory experience, then that's what it is.

My opponent's claim is that my experience of a speaker's voice must be cross-modal since it involves both my ears and my eyes and the physiological and nervous systems processing the input from ears and eyes, and since the proximal stimuli relevant to both vision and hearing are involved in this experience. But this reasoning presupposes that sense organ and proximal stimulus are relevant to the individuation of our senses, a claim I have rejected above. Given this, I can insist that the subject is the ultimate authority on her own sensory modalities, so that her senses must be individuated according to her judgments.

The other option is to take a softer line and to concede that sensory modalities are the sensory modalities they are in virtue of sense organ, proximal stimulus, and relevant physiological and neural structures. Consequently, the subject's judgment that she has an exclusively auditory experience is only apparently incorrigible. Even though it seems unconceivable to the uninformed perceiver that she could be mistaken in her judgments about her sensory modalities, cognitive science shows that subjects are prone to error in such judgments. For they fail to recognize the cross-modality of some of their perceptual experiences.

But even this result would not be problematic for the psychological side of my proposal: For one, we do sometimes notice when an experience is cross-modal. For instance, eating a spicy chili involves not just a gustatory experience of spiciness; it is also a painful experience. For another, the (arguable) fact that our judgments of our sensory modalities are not always reliable is compatible with my psychological claim that we form immediate judgments regarding our sensory modalities based on our introspective access to the functional organization of our personal-level minds. For it is possible that this access is not perfect. Alternatively, it is possible that not everything that goes on in our minds at sub-personal levels is perfectly reflected in the functional make-up of our personal-level minds.

To sum up this section, I have discussed two problems for my proposal raised by, first, sensory modalities that we have no immediate introspective knowledge of, and second, cross-modal perceptual experiences. Both of these phenomena are initially problematic for my view because, according to it, we have immediate and incorrigible access to the sensory modalities of our occurrent perceptual experiences in functional terms.

As to point one, I have conceded that there may be sensory modalities that we have no introspective access to, but argued that this is no problem for my view. With respect to the second problem, I have suggested a hard line one might take: The subject alone is the authority on her sensory modalities, so that supposedly cross-modal experiences turn out to be experiences in only one modality if this is how things strike the perceiver. But I have also described a soft line, according to which our judgments of the sense modalities of our occurrent perceptual experiences are only apparently incorrigible. Really, these judgments are sometimes mistaken, in particular in the case of cross-modal experiences.

I have to admit that I am undecided which of the two lines to take. On the one hand, it is preferable not to devise views in the philosophy of mind that conflict with findings in cognitive science – this consideration clearly favours the soft line. On the other hand, the soft line casts doubt on our self-knowledge of the sensory modalities of our occurrent perceptual experiences. The problem lies not so much in my proposal of how we can individuate our

senses, but rather in a conflict between the intuitive view that we can have immediate, incorrigible knowledge of our senses and recent findings of cognitive science.

4. Conclusion

In this paper, I have tried to find an answer to the question of how ordinary subjects can know about the sensory modalities of their own occurrent perceptual experiences. I have argued against four classical individuation criteria, viz. sense organ, proximal stimulus, phenomenal character, and representational content, and against one recent one, viz. proprioceptive representational content. Further, I have identified three intuitive features of our judgments of the sensory modalities of our perceptual experiences: their immediacy, non-inferentiality, and their incorrigibility.

My own proposal, which can respect these features, is that subjects have immediate introspective access to the functional organization of their personal-level minds, including the perceptual channels through which certain aspects of their environments are presented to them.

I have discussed two problems for the claim that we can form immediate and incorrigible judgments concerning our sensory modalities (introspectively inaccessible sensory modalities and cross-modal experiences). I conceded that the latter problem indeed casts doubt on the (intuitively plausible) incorrigibility of our immediate judgments about our senses. This is not a problem for my psychological claim about the mechanism which enables us to form judgments about the sense modalities of our occurrent experiences. But it is a problem for the plausible related epistemological claim that we have privileged access to (and incorrigible self-knowledge of) the functional organization of our personal-level minds, including the perceptual channels through which perceptual content enters our minds.

This could be taken as a starting point for further very interesting epistemological questions as to how we can know our senses, on my proposal: Are the proposed personal-level perceptual channels a direct reflection of the sub-personal functional organization of our minds? Or are they somewhat analogous to the user interface of a computer, which at best corresponds very vaguely to its actual functional makeup? Unfortunately, I will have to leave a discussion of these questions for another occasion.

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