

KNOWING THROUGH HEARING, TOWARDS AN EPISTEMOLOGY OF AUDITORY PERCEPTION*

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This paper proposes some guidelines for the undeveloped discussion of auditory epistemology. Auditory epistemology is an approach concerned with the perceptual basis for knowledge and belief, specifically around audition. The article pursues two goals. Firstly, it claims that addressing auditory perception from the viewpoint of epistemology is more fruitful than the discussion on phenomenology which has thus far dominated the debates in the literature on sound. Secondly, it elaborates a concrete proposal pertaining to the cooperation of sense-modalities. In so doing, a model for “Perceptual Coherence” is suggested. The first section of the paper critically reviews the problem of perception as it is usually understood in traditional epistemology. An ensuing section outlines the model of perceptual coherence.

Keywords: sound, auditory perception, auditory epistemology, perceptual coherence, sense-modalities, the problem of perception

ЗНАНИЕ ЧЕРЕЗ СЛУШАНИЕ: НА ПУТИ К ЭПИСТЕМОЛОГИИ АУДИАЛЬНОГО ВОСПРИЯТИЯ

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В статье формулируются идеи пока еще не развернувшейся дискуссии по эпистемологии слуховых феноменов и восприятий, или аудимальной эпистемологии. Она исследует аудимальные перцептивные основания для знания и убеждения. Статья преследует две цели. Во-первых, она утверждает, что обращение к слуховому восприятию в контексте эпистемологии более плодотворно, нежели феноменологические исследования, которые до сих пор доминировали в дискуссиях о звуковых явлениях. Во-вторых, в статье формулируется конкретное решение, связанное с взаимодействием чувственных модальностей и отношением перцептивной когерентности, модель которого рассматривается. Первая часть статьи обращается к проблеме восприятия в рамках традиционной эпистемологии. Во второй части описывается модель перцептивной когерентности восприятия.

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Ключевые слова: звук, аудиальное восприятие, аудиальная эпистемология, перцептивная когерентность, чувственные модальности, проблема восприятия

1. Introduction

Let us propose the next scenario. I am working in my studio while, all of the sudden, I hear: “crash”. The sound resembles that of a broken glass and it seems to *come from* the kitchen. My cousin is upstairs and he did not hear, nor see, what just happened. My mother is in the kitchen and she heard and saw what happened: indeed, a glass bottle fell from the counter and broke. Eventually, my cousin came downstairs and saw us picking up the pieces from the floor. “What are you doing”, he asks. “Ah, I see, you were upstairs and didn’t *see* what happened here”. However, I add, “Mom, I didn’t see it either, but I heard it, and I knew what happened”.

This absolutely mundane scenario does not seem to have anything strange on it. However, there are language uses here that could be regarded as inaccurate. When my mother tells my cousin “you didn’t *see* what happened here”, she is probably not using the verb “to see” in a way in which she specifically and exclusively refers to the visual sense-modality. What she probably meant by this is “to perceive” in a broad sense. In my case, I did not “see” what happened, but I heard the crash.

Further, in the little scene, I use the verb “to know”. But can I really say that I *know* that a glass bottle broke in the kitchen? The glass could have been broken in the corridor, not in the kitchen. And it could not have been a glass bottle but a window. However, one might contest, I inferred that the location of the accident was the kitchen based on several other assumptions: we usually do not have glass bottles in the corridor, but in the kitchen; the floor of the kitchen is harder than the carpet in the corridor; and finally, the intensity or volume in which I heard the accident: the corridor is closer and I would have heard it more intensely. Additionally, I *assume* it was a glass bottle and not a window, because their crashing, despite being both made of glass, *sounds differently*.

In considering this, many questions are open: could I say that my mother is more justified (than me) to claim “I know that a glass broke” because she *saw* it AND *heard* it? What does my claim imply in terms of foreknowledge? Do spatial predicates enter into the things I can *know* through hearing?

This paper addresses the epistemology of auditory experience. The subject, in itself, has been hardly explored by other authors in detail. On the one hand, the contemporary philosophy of sound and auditory experience [e.g. Casati & Dokic, 1994; Casati, Di Bona, Dokic, 2013; Casati, Di Bona, Dokic, 2020; Di Bona, 2017; Leddington, 2019; Méndez-Martínez,



2020a; Méndez-Martínez, 2020b; Nudds, 2009; Nudds, 2018; O’Callaghan, 2007; O’Callaghan, 2010; O’Callaghan, 2011; O’Shaughnessy, 1957; Young, 2018; Young, 2021] has paid little or no attention to the relationship between auditory perception and knowledge (or belief). Likewise, on the other hand, traditional epistemologists dealing with perception (for instance, those working on the problem of perceptual justification) have not addressed audition in a conspicuous manner. The field to foray, in this sense, is quite vast. Against this background, this paper expounds the *epistemological question* of audition, namely: what (and how) can I know through hearing?¹

The goals to pursue are two. The first one is related to defending an epistemological approach to auditory perception *vis-à-vis* the phenomenological concern. If my intuition is correct, an epistemological focus is richer and more relevant. A second and more specific goal is related to the proposal of this paper concerning the framework of *perceptual coherence*.² A way of approaching perception involving the cooperation among sense-modalities is still missing in the literature. A derived upshot from this second goal is to emphasize the prejudicial effect of ‘visuocentrism’, which is pervasive in the philosophical discussion about perception – O’Callaghan [2007] calls it the ‘tyranny of the visual’.

The first section is devoted to the outlining of the epistemological “problem of perception”, transforming it into *the problem of auditory perception*.

In the second section, I propose the frame of perceptual coherence and the interaction of sense-modalities in order to understand epistemic justification. This section also aims to provide an incipient understanding of the discussion in formal terms.

A final section wraps up the discussion and considers potential competitors.

¹ The epistemological question tries, in this sense, to distinguish itself from the dominant inquiries in the philosophy of sound and auditory experience, namely, the ontological question – “what is the nature of sound?” – [Casati & Dokic, 1994; O’Callaghan, 2007; Pasnau, 1999]; the topological question – “where is sound?” – [Casati, Di Bona & Dokic, 2020]; the causal question – “what is the relationship between a sound and its source?” – [O’Callaghan, 2011; Casati, Di Bona & Dokic, 2013; Leddington, 2019; Nudds, 2018].

² I owe the term to Stephen Handel’s [2006] work *Perceptual Coherence, Hearing and Seeing*, where he explores the cognitive features that allow cooperation between those sense-modalities, namely, vision and audition. The work is mostly written from the viewpoint of psychology and neuroscience. In that sense, this paper is rather devoted to the philosophical exploration of these aspects, something Handel does not engage with.



2. The Problem of (Auditory) Perception

In traditional epistemology, the so-called “problem of perception” basically comprises whether perception can be a source of knowledge and, if yes, how; and, on the other hand, whether perception render epistemic justification. So far, the discussion has been primarily focused on vision, but now we can mention auditory examples.

We can appeal to the scenario depicted at the beginning. By auditory means, I heard that something broke. So, definitely I can say that it was by perception, and more specifically auditory perception, that I learnt about the accident. At first glance, it seems that I gain knowledge through audition.

However, even though in the depiction I was right about a broken glass bottle, I could have been wrong: it could have been another type of object, a recording or a video of a glass breaking, etcetera. In that case, perception does not yield knowledge. Hence the problem of justification.

Dicker (1980) considers the problem to be an antinomy. We could envision its extremes as follows:

- Positive Epistemic Perception (PEP):** Perception yields knowledge
- Scepticism on Epistemic Perception (SEP):** How can possibly perception yield knowledge?

However, traditional epistemology used to consider justification (in this case epistemic justification) to be a case of an ‘either-or’ exclusive disjunction: either perception (or belief or something else) justifies knowledge or it does not.³ One of the core ideas I want to propose in this paper is that of a spectrum between **PEP** and **SEP**. Certainly, the idea is not outlandish as it relates to debates on the weight of evidence or measures of confirmation in formal epistemology [Christensen, 1999]. Thus, one can be more or less justified to believe or to claim knowledge depending on evidential basis, and other sort of circumstances.

PEP accordingly would imply the following ideas:

PEP-Object: The object of perceptual knowledge is the outside world.

PEP-Means: The means of perceptual knowledge are sense-modalities, i.e., vision, audition, olfaction, touch, and taste.

PEP-Organs: Perceptual knowledge depends on our sensory organs, that is, without a visual system (i.e., the full-blinded people), one does not access perceptual knowledge the way a person with visual system does; the person without an auditory system (i.e. fully deaft) does not access perceptual knowledge the way a person with auditory system does. And the like.

³ There are noticeable exceptions to this, for instance [Christensen, 1999], and [Hawthorne & Logins, 2021].



Notice that **PEP-Organs** points to an affected perceptual knowledge as a whole and not only that sense-modality, which would be true but redundant. That is because of the point I shall insist on in the next section.

A second note is that **PEP-Object** goes along with a thesis usually mentioned in the literature on sound: “Audition provides us with information about our surroundings”, which can be refined into the idea that “audition provides us with *spatial* information about our surroundings”.

Examples of this abound for vision, but are scarce when it comes to other sense-modalities. This tendency can be called ‘visuocentrism’. Visuocentrism is a pervasive attitude of philosophers dealing with perception either in philosophy of perception proper or epistemology. Its strong formulation could be understood in the ensuing fashion:

Visuocentrism: There are no specificities for each sense-modality while theorising on perception. Vision provides the main guidelines for all other modalities.

To my knowledge, nobody champions this view. However, the literature’s current state of affairs somehow credits strong visuocentrism. Despite efforts to philosophically discuss other sense-modalities [e.g., Kubovy & Valkenburg, 2001; Batty, 2009; Skrzypulec, 2019; Green, 2019], the mainstream tendency is still focused on vision. In the following section, I will outline the differences and interactions among sense-modalities. For now, let us assume that perception can be treated uniformly to see how it relates to the other attitudes at stake, namely, knowing and believing.

A significant change on how I want to address perception is that of taking it as an *attitude*. The term “propositional attitude” was first used by Russell [1912] while referring to the verbs “knowing” and “believing” – and other verbs less often used could enter as well, like “assume”, “fear”, “suspect”, “doubt”, and so on. In those contexts, the preposition p , for instance “it is raining”, can be known and believed (or assumed, feared, etc.). These attitudes were later formalized with the operators K and B , for knowledge and belief respectively. That way,

K_{ap} (“it is raining”), would mean that “ a knows that it is raining”;

B_{ap} (“it is raining”), would mean that “ a believes that it is raining”.

If perception can be taken as an attitude, then we could choose the P operator to say that,

P_{ap} (“it is raining”) = “ a perceives that it is raining”.

Considering Hintikka’s [1962] effort on formalising the notions of knowledge and belief, as well as the subsequent tradition in formal epistemology, we can only hint at some of the basic relationships that exist in the interacting scenario of knowing, believing, and perceiving. For instance, it is typically accepted that

$K_{ap} \rightarrow B_{ap}$.



Let us call this *epistemic entailment of belief*. This means that whenever I know something, I also believe it, there are no sound cases where I could know p and not believe that p . It does not make sense to say that “I know that Sasha is crying, but I don’t believe that Sasha is crying”.

The backward entailment, that is the *doxastic entailment of knowledge*, where

$$B_{ap} \rightarrow K_{ap}.$$

Is obviously not true, since there are many things I can believe, where I cannot however claim knowledge. I might believe that “Sasha is going to be happy for the rest of her (his) life”, but there is no way I could know this.

Let us consider perception, starting with the one-to-one relationships to other attitudes.

Certainly, the following is not true

$$K_{ap} \rightarrow P_{ap}.$$

Since there are things I can know, for instance mathematical and logical truths, where perception’s role, if any, is irrelevant. The latter might be contingently true only in cases pertaining to *factual* things, happenings in the environment and so on. Therefore, a *perceptual entailment of knowledge* only applies in certain cases. That is precisely the *quid* in the “problem of perception”. It typically implies the following,

$$K_{ap} (\text{“x to be } F\text{”}) \rightarrow P_{ap} (\text{“x to be } F\text{”}).$$

However, as there are cases where x could not be F , for instance a for a tomato to be (or to appear) red, a possible amendment is that:

$$K_{ap} (\text{“x to be } F\text{”}) \rightarrow P_{ap} (\text{“x to be } F\text{”}) \equiv p (\text{“x to be } F\text{”}).$$

The amendment, alas, does not suffice, since in a “tomato to appear red” case, the illumination conditions might include some sort of reflection where any object would appear red.

The other way around, say, an epistemic entailment of perceiving, is far more interesting. Taking the Handel’s “perception is interpretation” line as a *leitmotif*, a way to understand the relationship with knowledge and belief will be as follows. Browsing from our glass bottles example from the beginning, we can say that in order for me to perceptually know, or to claim knowledge on a perceptual basis, I had to know how a broken glass bottle sound. Likewise, other previous information is needed for me to assess that it happened in the kitchen and so forth. The idea is mainly that my auditory experience at that moment *matches* with some sort of auditory file qualified by a number of matching auditory sensible qualities, namely, intensity, pitch, and timbre.

The idea of a **matching file** for auditory perception could be thought of for another sense-modalities. Auditory files, tactual files, and so on.



This file-matching inference is at the core of what Fred Dretske [1969] once outlined as the differences between seeing and epistemic seeing. Dretske conceives of seeing things as a way of “getting information about them” [Dretske, 2000, p. 112], yet the main concern is where simply (or non-epistemic) seeing does not imply a conceptual structure nor has any bearing in we believing things. Dretske uses a lot of examples where we perceive things, about which we don’t know anything (conceptually), or cases where we are not *aware* of what we perceive. For example:

What a person believes (about what she sees), and what she is consequently prepared to assert or deny about what she sees, is conditioned by the conceptual and cognitive resources she has available for picking out and identifying what she sees. If she does not know what a marsupial is, she isn’t likely to believe that she sees one. And if she mistakenly believes that kangaroos are the only marsupials, she might well believe she sees no marsupials when, in fact, she sees them (opossums) all over the yard [Dretske, 2000, p. 103].

These considerations apply to auditory experience. Precisely when going from simply *hearing* to *hearing epistemically*. This can reflect the differences between “hearing” and “listening”, which are reflected in other languages (for instance, in Spanish “oir” and “escuchar”; in Russian, слышать and слушать; in French, “entendre” and “écouter”, being German an exception without that verbal distinction). One could say that *hearing epistemically* is closer to “listening” (and its versions in other languages) than to “hearing”.

However, even in the epistemic cases where there is a **matching file**, can we claim to know or believe x on a perceptual basis? Or something else is needed? An interesting way to learn that is by starting to draw the differences between sense-modalities

3. Epistemic Differences Across Sense-Modalities

In the depicted scenario of the broken glass bottle, I happen to claim that “I know that a glass bottle was broken” taking into account other things: previous knowledge of how a broken glass sounds, how things sound from a certain distance, the intensity on which broken glass bottles sound, and so forth.

Additionally, since I have considered this endeavour to be an attempt to counter visuo-centrism, operators for each sense modality are highly advisable not to consider every appearance of the P operator as an equivalent of “seeing”. That way, one could express the following:

S_{ap} (“it is raining”) = “a *sees* that it is raining”;
 H_{ap} (“it is raining”) = “a *hears* that it is raining”;
 F_{ap} (“it is raining”) = “a *feels* (tactily) that it is raining”.



And even,

O_{ap} (“it is raining”) = “a *smells* that it is raining”;

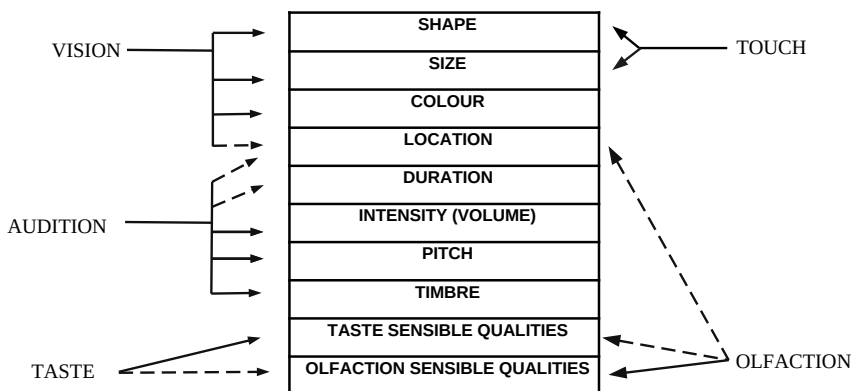
T_{ap} (“it is raining”) = “a *tastes* that it is raining”.

Although, admittedly, the last two operators might not be that common in our perceptual reports, and especially while considering interacting sense-modalities, they are important to have in mind and, as I will emphasise further on, they also could play a relevant role.

Besides what has been described in the previous section as **PEP-Object**, **PEP-Means**, and **PEP-Organs** a couple of words can be added on how **PEP-Means**, that is the sense-modalities, work. A large part of the discussion on perception observes the sensible qualities captured by it. Oblivion to the differences across sense-modalities, the typical examples were vision-based. Shape, size, and colour are typically within the scope of vision. But some of them are also accessible to touch, for instance shape and size.

An interesting question is whether the shared sensible qualities are actually *shared*. This was once considered by John Locke [1999] as the “Problem of Molyneux”. Shape and size are arguably sensible qualities that are shared by both vision and touch. However, what would happen if a blind person who, knowing the tactile sensory input of the shape and size of a determined object (e.g., a pointy three-dimensional star), is eventually bestowed with vision? Could she know that the object is a star-like without touching it? In this sense, one could say that there are at least two – ways of apprehending – shapes: $shape_v$ and $shape_t$. And that this consideration could be applied to other shared sensible qualities.

The considered qualities can be gathered as follows:



So, on the one hand, we have sensible qualities that can be captured by more than one modality and, on the other, we have sensible qualities that are experienced in tandem around one phenomenon or state of affairs.



Sensible qualities for the chemical senses also need other considerations. For starters, there is an extended understanding according to which they are the *same* sense-modality and, thus, olfaction just gives a spatial field to those sensible qualities. Given its phenomenal differences, I will keep those sense-modalities apart in what follows (moreover, they will not play a more crucial role in the argument). I think they probably share many sensible qualities. One can smell and taste something sweet. However, at the moment I am unsure whether sweetness is a sensible quality or a point or threshold within a spectrum which would be a quality. The whole spectrum however could likely be considered to be a sensible quality. I also have the intuition that they do not share most of these qualities (whatever they happen to be) with audition or vision. A notorious exception would be location, which olfaction and audition can approach to, not with the same acuteness of vision.

Finally, we have some moot sensible qualities such as duration and location. O'Shaughnessy [1957] claims location is something we can eliminate from what is considered purely auditory. The same could be said for the way olfaction or vision apprehend location and duration. It could be also argued that they are shared with some "exotic sense modalities" [Matthen, 2015] such as "the sense of time", or the "sense of location". This is an interesting idea, even more so when we consider that the ear hosts not only audition but the vestibular system responsible for the sense of equilibrium. But a proliferation of sense-modalities for the moment does not advance our argument in any significant sense.

Two ideas are worth taking into account. The first one is that of *sharing*, that is, the possibility that two or more sense-modalities can account for a sensible quality, even if at certain instances a distinction between $size_v$, $size_t$, and $size_h$ is useful.

The other key aspect is *conjunction*. For instance, perhaps taste shares some common ground with touch however, but there is also the possibility that the textures experienced while tasting to have a contingent conjunctive occurrence: for instance, while eating pelmeni you feel the gummy texture with the tongue and in your mouth; but the flavour seems to be on a different, yet coexisting, level.

Thanks to *sharing* and *conjunction* we have a multimodal apprehension of reality. We now have the elements to describe the idea of perceptual coherence. It can be defined in the ensuing manner

Perceptual Coherence: An experience is perceptually coherent if the sense-modalities involved in it capture different simultaneous aspects of an object and result in a coherent object. A coherent object is made of pieces of information that coincide with our previous perceptions, and first-hand or shared knowledge.

It is interesting to notice that a circular and trivial definition is avoided, when one could easily fail at saying something like "a perception



is coherent if the sense modalities are coherent with each other”, or “result into a coherent perception”. The definition qualifies “experiences” and not “perceptions”. Additionally, the definition is different to that of veridical perception. Veridical perception assumes that a perception P of x is veridical iff x . Veridical perception would be entailed in the definition.

It seems, however, that there is something missing in the definition or, perhaps, there is a coexisting principle that should be stated. For I could see that it is raining, but perhaps I am not hearing the sound of rain for whatever reason. That situation would be different to that of seeing that it is raining but simultaneously hearing to be in the middle of a sand-storm. Or seeing that it is raining and feeling that it is sunny while being out of shelter and exposed to the rain.

The first case amounts to that of perceptual completeness or incompleteness, whereas the second refers to a case of perceptual incoherence or dissonance. Perceptual completeness can be understood in the following manner:

Perceptual completeness: relationally, an experience is perceptually more complete than another if it is assisted by more sense-modalities inputs.

Perceptual incompleteness and perceptual incoherence can be met at the other side of the spectrum of the former definitions. Let us explore both ideas more. Let us stick to the rain example. Typically, if Gleb perceives that it is raining, most of us may think that “Gleb sees that it is raining”. But perceiving that it is raining can include other sense-modalities’ inputs and not necessarily that of seeing. Thus:

$$P_{ap} = S_{ap} \vee H_{ap} \vee F_{ap} \vee O_{ap} \vee T_{ap}.$$

Notice that I use “ \vee ” and not \oplus , since it could include any combination. “To hear that it is raining” & “To scent the rain”. O_{ap} and T_{ap} might not be included in our typical reports about “perceiving that it is raining”, yet one could say that the scent of the concrete or the grass during and after rain is very characteristic.

Now if I see that it is raining, but I don’t hear anything and auditory circumstances are normal (e.g., I am not wearing headphones or covering my ears), then my experience would be incomplete. But if I were to hear something like fireworks when I see that it is raining, or the other way around, then it would be a case of perceptual incoherence or perceptual dissonance.

Finally, we have the elements to explicate perceptual justification in a different way in the light of the previous discussion.

At least three conditions seem to bolster perceptual epistemic justification: coherence, completeness and veridicality. Theorising on veridicality is, at the moment, beyond our scope and, on the other hand, it is the one aspect that has received extra attention in the literature. As for coherence and completeness they could be certainly understood in a multi-



valued fashion. The idea is simple: the more complete and coherent a perception on X is, the stronger the justification to claim either knowledge and/or belief.

In the case of the glass bottles, who is more justified in claiming to know what happened? My mother who saw it and heard it? Or me, who only heard it? Clearly my mother is more justified, since her perceptual experience is more complete than mine.

Therefore, “ $S_{ap} \& H_{ap} \& F_{ap}$ ” is more justified than “ $S_{ap} \& H_{ap}$ ”, and “ $S_{ap} \& H_{ap}$ ” is more justified than “ S_{ap} ” alone (or H_{ap} or F_{ap}).

This is because the cooperation between sense-modalities implies a mechanism of *corroboration*.

However, taking an additive interpretation of justification as good news is probably wishful thinking. For there are scenarios where probably one would be more justified to believe that p based on S_{ap} , than on “ $O_{ap} \& T_{ap}$ ”.

Let us suppose that I say,

“I know that Sasha is crying in the library, I heard him (her)”.

One could feel tempted to inquire: “Okay, but did you actually see him (her)?”

On the other hand, if I say

“I know that Sasha is crying in the library, I saw him (her)”.

According to *completeness*, if someone claims to have seen Sasha crying and she saw him (her) *and* heard him (her), then she is definitely more justified than the one who only claims on a uni-modal perceptual basis. However, while having to bestow more epistemic weight to one of the claims, on different perceptual basis (one from vision, the other from audition), it is likely that vision is the winner sense-modality. This suggests that for those whose sense-modalities work normally, there is a hierarchy of sense-modalities, and one where vision is on the top.⁴ Human animals are, after all, visual creatures.

Among the things one could question is whether there are actually experiences whose perceptual basis is *unimodal*. Since the McGurk effect [McGurk & MacDonald, 1976], now a text-book example of perceptual dissonance, it has become evident that in our picture of reality there is a strong influence of vision on audition, and the other way around as well. The inclusion of other sense-modalities will soon be a required step to understand the way perception informs our beliefs and knowledge about the world.

⁴ The use of this adverb (“normally”) is contentious, as cognitive anthropologists might find the hierarchy to be different in certain cultural contexts.



4. Conclusions

At the beginning of this paper, I stated two goals to be pursued. The first one was related to prove that analysing and theorising on the importance of the epistemic features of perception, and more specifically auditory perception, would lead us to a more promising discussion than the one on phenomenology. I deem this to have been shown and just as evident as the epistemological discussion is: formal considerations can be taken into more complex modelling, other epistemological problems can be introduced, and a proliferation of theories can arise from the discussion here proposed. Even if some of the parts of the argument are eventually dismissed or countered, the first step towards opening the path for auditory epistemology is irreversible.

One could say that there is no need of having a detrimental opinion on the trend that gives phenomenal adequacy, and “the phenomenology of audition”, the heaviest spot in the discussion. One could certainly propose an epistemological framing without the need of doing that. Further, one could be both sympathetic towards phenomenological discussions and epistemological ones. There is no logical contradiction nor reason why to contrast them or, even more, to take them apart. This is a reasonable stance. However, the reason of my insistence on an ‘epistemology vs phenomenology’, while addressing perception, has been rather of a conjunctural sort. Otherwise, we face the risk of theoretical stagnation, and that is something that a young discussion such as the philosophy of sound and audition should not afford.

Goal two is devoted to the framework of perceptual coherence, perceptual completeness and perceptual dissonance. To qualify an experience as more perceptually coherent and complete than the other leads the way to understand, in a different a more original manner, the problem of epistemic justification. Coherence and justification go together and this is a significant contribution.

In opening the discussion for an epistemology of auditory experience, some medium and minor pluses are worth noticing. First, the ‘denounce’ against the pernicious consequences of visuo-centrism. Although no known author engages with strong visuo-centrism, the effects of neglecting other sense modalities and their interaction are common. This paper is not contesting by means of any sort of, say, audiocentrism.

Despite the fact that, as shown in most circumstances, vision has the last word in justifying or securing perceptually, my argument is aimed against modality-preference tendencies (if one could call visuo-centrism one of such tendencies), and rather pursues an understanding where different sense-modalities cooperate [e.g., Kubovy & Valkenburg, 2001; Matthen, 2015; O’Callaghan, 2016; Green, 2019; Skrzypulec, 2020].



Epistemology is a vast field where the discussion on audition and other sense-modalities can head to. However, it is not a uniform field. An expectative for this paper was to contribute in that direction without oversimplifying the diversity of epistemological debates. The paper is noticeably written from the tradition of philosophy of sound and perception rather than from epistemology. In that sense a more refined display of positions in traditional and formal epistemologies in the future would turn out to be quite a positive outcome. Critiques from epistemologists are pretty welcomed.

Finally, the proposals made in this paper consider falsifiability as a virtue. It is interesting to think what arguments or theory could counter what has been presented here. I think that three clear candidates would be defenders of visuocentrism, uni-modalists (that is, those who think, just like the visuocentrists, that modal-specificity is above the interaction among sense-modalities), and those who push the phenomenal adequacy desideratum up to the end.

Theoretical proliferation of views concerning perception is also expected. Sense-datum theories, adverbialist strategies, phenomenalism, and different sorts of realism are all possible. I have presented the idea of perceptual coherence remaining neutral to those debates, but all those turns are feasible ways of continuing the discussion.

Finally, the scope of things that I can *know* through hearing is wide. It will be a matter for another debate whether the contents and objects of auditory perception overlaps with its epistemic treatment.

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