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Logic and Phenomenology of Non-Visual Representation

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Topic Value of the Research

This thesis investigates the philosophical repercussions of a particular token of non-visual representation: sound and auditory perception. Although sound had traditionally been conceived of as "a secondary quality",[1] the renewal of the discussion, in the works of P.F. Strawson and Brian O'Shaughnessy in the 50's, had a different approach to sound. In particular, the last 15 years, starting with the publication of Casey O'Callaghan's *Sounds, a philosophical theory*,[2] and more intensely the last five, saw an increasing interest in the debates around sound and audition. It is in this trend that this investigation is inscribed. The contributions are also directed to that field of discussion.

The dissertation contains five chapters that revolve around the philosophy of sound and auditory experience, offering, as a unifying link, a metaphilosophical perspective. The first chapter sets forth the metaphilosophical framework; the second and third chapter address descriptively the guidelines of two philosophical theories on sound (the property view and the event view, respectively), not without noticing the difficulties of their developments and, hence, emphasising the problem of *conceptual underspecification* and *ontological reduction*. The fourth and fifth chapters are rather constructive and they put forward new ideas concerning the problem of spatial and logical representation and the epistemology of auditory experience.

There are several difficulties in the overall discussion of the philosophy of sounds and auditory experience that have a direct and negative effect in theory choice. We pay special attention to the problems of *conceptual underspecification*, *ontological reduction* and *spatial segmentation*. A systematisation of the positions, their core principles and desiderata is required.

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[1] In particular, in John Locke's *Essay on Human Understanding*: Locke, J. An Essay Concerning Human Understanding, Pennsylvania: University of Pennsylvania Press, 1999. For a historical perspective: Pasnau, R. Sensible qualities: The case of sound// Journal of the History of Philosophy, 2000, Vol. 38, No. 1 P. 27–40

[2] O'Callaghan, C. Sounds, a philosophical theory. Oxford: Oxford University Press, 2007

The metaphysical discussion is focused on the ontological, topological, and causal questions. The ontological question is concerned with the nature of sound; the topological question revolves around the location of the (perceived) sound; and, finally, the causal question queries the relationship between sounds and their sources. Accordingly, there are three available taxonomies for these questions. An ontological taxonomy is mainly proposed by O'Callaghan, who envisions three types of theories: the "Wave View" (WV), according to which sounds are pressure waves; the "Property View", according to which sounds are properties; the "Event View", according to which sounds are events. The topological taxonomy, which is proposed by Roberto Casati and Jérôme Dokic, has also three options: 'proximal theories', for which sounds are in or at the hearer; 'medial theories', which considers that sounds are in the medium; and "distal views", which considers that sounds are near to the sound producing event or source. Finally, the causal approach, partially tuned with Jason Leddington,[3] is concerned with the type of relationship that sounds have with their sources. There are (roughly) six ways to understand the relationship between sounds and its sources: causality (a sound is "the effect" of an event; the event is "the cause" of a sound), bearing (e.g. events 'bear' sound, objects 'bear' sound, sound 'bears' audible qualities, etc.), parthood (sounds are parts of the events), identity (the sounding events and the events that are thought to be their causes are one and the same thing), audibilia (sounds are pure objects of hearing no holding relationship to its sources), and testimony (sounds testify the events that produce them). The taxonomy employed in this research is mainly the ontological one. Let us review what each view entails.

The Wave View (WV) claims, from Aristotle[4] to modern acoustics, that sounds are acoustic pressure waves. There are a number of issues that WV cannot account for. The most important one is that it presupposes an Error Theory of perception: we do not perceive sounds to be at any acoustic wave as a vibration in an elastic medium. We perceive them as coming from a source (a sounding object, an event, etcetera).

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[3] Leddington, J. Sounds Fully Simplified // Analysis, 2008, Vol. 79, No. 4 P. 621-629; Leddington, J. The Event-Property View of Sounds (manuscript). 2021

[4] Pasnau, R. Sensible qualities: The case of sound// Journal of the History of Philosophy, Vol. 38, No. 1 P. 27–40

This gives rise to the phenomenological adequacy desideratum, which any prospect of Sound ontology should comply with. At least, as O'Callaghan[5] notices, it is better to choose a theory that explains the phenomenological aspect of sound, to one that does not. Is this a necessary constraint, an inescapable requirement? Authors differ on the degree of importance they assign to it. Mark Eli Kalderon,[6] for instance, considers that it has been assigned an excessive weight.

Another option is that of PV, which is twofold: it either describes sounds as properties of the perceiving mind (PV1) or it describes sounds as properties of the sounding objects (PV2). There are few proponents of the first view and it is usually a label elaborated while being under criticism. D. C. L. Maclachlan is usually one of the few that are identified with the idea that sounds could be sensations.[7]

The most common option within Property View is that of PV2, which argues that sounds are properties of the sounding objects. The typical route for sounds to be taken as properties is that of dispositional properties. Thus, sound dispositionalism is the popular view within PV theories.

Finally, we have the case of the event view (EV), defended by O'Callaghan,[8] Roberto, Jérôme Dokic and Elvira Di Bona.[9] O'Callaghan defends what the latters label as

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[5] O'Callaghan, C. Sounds, a philosophical theory. Oxford: Oxford University Press, 2007 p. 14

[6] Kalderon, M. E. The Event of Rarefaction and Development of the Wave Theory of Sound. 2020 (Manuscript), URL: https://philpapers.org/archive/KALTEO- 15.pdf

[7] Maclachlan, D.C.L. The Philosophy of Perception. Englewood Cliffs: Prentice Hall, 1989

[8] O'Callaghan, C. Sounds and Events// Nudds, M., O'Callaghan, C. Sounds and Perception: New Philosophical Essays. Oxford: Oxford University Press, 2009 P. 26-49; O'Callaghan. Constructing a Theory of Sounds// Zimmerman, D. (ed.), Oxford Studies in Metaphysics, Vol. 5. Oxford: Oxford University Press 2010, P. 247-270

[9] Casati, R., Dokic, J. La philosophie du son. Nîmes: Editions Jacqueline Chambon, 1994; Casati, R., Dokic, J. Sounds// Zalta, E. Stanford Encyclopedia of Philosophy, 2014 URL: https://plato.stanford/archives/fall2014/ entries/sounds/; Casati, R., Dokic, J. Some Varieties of Spatial Hearing"// Nudds, M., O'Callaghan, C. Sounds and Perception: New Philosophical Essays. Oxford: Oxford University Press, 2009 P. 97- 110; Casati, R. Dokic, J. Di Bona, E. The Ockhamization of the event sources of sound // Analysis, 2013, Vol. 73, No. 3 P. 462- 466

"Relational Event Theory", whereas the option defended by Casati and Dokic —later joined by Di Bona— is that of the "Located Event Theory".

In short, these are the views present in the discussion about sound, which offer a general description of the discussion. These possibilities present certain issues. By appealing to metaphilosophy we can, for instance, know whether this is an issue for theory choice and, if not, what options are at hand. With metametaphysics, in addition, we can investigate the possible equivalences, at a theoretical level, amongst the theories.

Object and subject of the research

The **object** of this research is the general corpus known as the philosophy of sound and auditory perception.

The **subject** of this research are the diverse discussions that comprehend the philosophy of sound and auditory perception such as the relationship between sounds and causes; the spatial features of sound; the problem of sounds as properties; the problem of sounds as events; and the problem of the objects and contents of audition.

Research methodology

The research methodology for this research can be listed as follows:

-Critical and metaphilosophical reconstruction of theories
-Analysis of linguistic-pragmatic uses of the term "sound".
-Formal Analysis
-Phenomenological analysis

This research takes its place mostly within the frame of the analytic philosophy tradition. In that sense, it prioritises *conceptual analysis* as the main methodological tool. Conceptual analysis varies on whether it appeals to the compositional criteria, or more plainly the analysis of the context of use of certain concepts (and in this sense it commonly appeals also to 'intuitions').[10] In that sense, this dissertation starts identifying the contexts where the concept of "sound" is used. As a result, some concepts are "borrowed" from other fields of discourse. However, this interdisciplinary circumstance can result in a conceptual confusion. That is precisely what happens with sound as it can be seen in an introductory treatise on sound. For example, in the "Science of sound",[11] it is stated that sound is:

-"An Auditory sensation in the ear"
-"The disturbance in a medium that can cause this sensation"

In the philosophy of sounds and auditory perception, this double presentation leads to several discussions concerning the ontological status of sound. We can label the first definition as $sound_1$; and the second, as $sound_2$. Interestingly, the first definition is close to the psychological understanding of sound; whereas the second to the physical conception.

In a commonsensical spirit, we could only say that there are two different uses. However, problems arise when $sound_1$-characterisations interfere with theorising on $sound_2$. This is also a philosophical concern: if no distinction is made, then we face a situation where scientific theories give incoherent accounts on sound. This is noticed by Robert Pasnau[12] while criticising 'the standard view' on sounds, where coexist the idea of sound as sensation and the physicalist approach. And, before him, Casati and Dokic[13] argued against the 'Classical theory' (*Théorie Classique*) that uncritically

[10] See: Cappelen, H. Philosophy without Intuitions. Oxford, Oxford University Press, 2012.
[11] Rossing, T.D., Moore, R., Wheeler, P.A. The Science of Sound, Edinburgh, Pearson, 2014
[12] Pasnau, R. What Is Sound// The Philosophical Quarterly, 1999, Vol. 49, No. 196, P. 309-324
[13] Casati, R., Dokic, J. La philosophie du son. Nîmes: Editions Jacqueline Chambon

combines the idea of sound as a secondary quality and the physical characterisation of a sound wave.

This is where we appeal to the methodological proposal known as *metaphilosophy*. Metaphilosophy has strong methodological features. This can be observed by the emphasis on metaphilosophy in metodological treatises and the fact that the *Oxford Handbook of Philosophical Methodology* has a large content dedicated to metaphilosophy. Metaphilosophy's toolkit includes not only conceptual analysis, but it examines our intuitions and our appeal to them. In a metaphilosophical sense, this has important implications.[14]

The reconstruction of the theoretical positions in the literature dedicated to sound and audition follows the guidelines of a metaphilosophical approach. In that sense, in addition to the aforementioned feature dedicated to the contexts of use, it stresses the theoretical comparison amongst the positions.

Furthermore, *formal analysis*, which can come in the form of *formal adequacy*, is something philosophers of sound have not been concerned with. As one of the main issues for this thesis is logical representation, in the fourth chapter, the formal aspects of the casuistic and instrumental approaches enable us to employ this methodological tool. The formal approach will have two considerations: the logical representation of sound in a mereotopological[15] sense; and, on the other hand, the diagrammatic use of sound as a means for logical expression.[16]

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[14] A famous position in metaphilosophy, that of Herman Cappelen, is that philosophy (altogether) should be continuous with science. However, in other sources, Cappelen himself defends an intellectual or disciplinary division of labour, while arguing that philosophers should stop doing semantics and leave that task for linguists.
Cappelen launches a heavy attack against the philosophical appeal to 'intuition' and, in a sort of connection with Williamson, this is also an argument against the so-called 'exceptionality' of philosophy in contrast with that of scientific disciplines.
See: Cappelen, H. Philosophy without Intuitions. Oxford: Oxford University Press, 2012; Cappelen, H. Why Philosophers Shouldn't Do Semantics// Review of Psychology and Philosophy, 2017, Vol. 8, No. 4 P. 743-762; Williamson, T. Philosophy of Philosophy. Oxford: Blackwell, 2007.

[15] The mereotopological project was once proposed by A. Whitehead and continued by R. Casati and A. Varzi. It stresses the analysis of the relation of parts and wholes (mereology) and the connections and

Finally, *phenomenology* here has more a methodological use. R. Casati and J. Dokic[17] have underlined the importance of know how sounds are perceived and the necessity of accommodate our philosophical theories of sound to 'our phenomenology' of sound. Hence the *phenomenal adequacy* desideratum. This receives the name of a 'method' not only by Casati and Dokic, but also by appealing to more concrete approaches, like the "method of phenomenological contrast",[18]

Main purpose of the research

This research's main goal is to critically assess the late development of the philosophy of sound and audition through the lens of metaphilosophy. In considering the main shortcomings of the debate (namely, those of *conceptual underspecification*, *ontological reduction* and *spatial segmentation*), this research pursues a *syncretic view* of sound, which does not incur in the aforementioned theoretical implications.

More concretely, in order to perform this assessment, the exploration considers the *desiderata*, both told and untold, that each theory or view on sound entails. It also analyses the analogies employed by the authors, which have a major weight while theorising.[19]

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locations of things (topology). In our case, it is an interesting debate to learn what criteria should be followed to talk about the "parts" of a sound; likewise, the discussion on its location is a very important one. See: Casati, R. Varzi, A. Parts and Places: The Structures of Spatial Representation. Massachusetts: MIT Press, 1999.

[16] This is mostly the project of A. Pietarinen. See: Pietarinen, A. "Is non-visual diagrammatic logic possible?// Pombo, A. Gerner, O. Studies in Diagrammatology and Diagram Praxis, College Publications, London, 2010, P. 73–81

[17] Casati, R., Dokic, J. La philosophie du son. Nîmes: Editions Jacqueline Chambon

[18] For example: Di Bona, E. Towards a rich view of auditory experience// Philosophical Studies, 2019, Vol. 174, No. 11 P. 2629-2643; Siegel, S. How can we discover the contents of experience?// Southern Journal of Philosophy, 2007, Vol. 45, No. 1, P. 127-142; Siegel, S. The Contents of Visual Experience. New York: Oxford University Press, 2010

[19] Analogies *per se* tell us very little and their importance lies in the way they are used. Curiously, although most authors in the literature have relied on analogies, especially analogies to colour and vision, they don't abstract over the structural aspects of analogical reasoning. As a result, it is argued that there is a false and pervasive use of the analogies, since they misguide the equivalence and the

The state of the research topic

If we start considering the idea of sounds as properties, a remote representative of this idea is John Locke, who in his *Essay on Human understanding* suggests the possibility of thinking of sounds as secondary qualities. In the contemporary debate, we can start with Robert Pasnau,[20] who made the suggestion of sounds being a dispositional property. Afterwards, we have John Kulvicki[21] who elaborated more on the issue with the idea of sound being a disposition of an object when "thwacked". A more systematic elaboration is that of Pendaran Roberts,[22] who considers several possible candidates for property views, with emphasis on the dispositional approach. Cohen,[23] on the other hand, has attended general issues of the philosophy of properties, like the debate on universals.[24]

Most property theories have opted for dispositionalism, that is, for the idea that sounds are dispositional properties. A reason for this may have to do with the heavy emphasis that most authors have on the "instantiation" of a sound. But it is not entirely clear how the ascription works here. In the standard sense, many speak about "the instantiation of sound on acoustic waves". Others speak of "supervenience". On Kulvicki the idea is that an object has the disposition to sound when 'thwacked'. Yet

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scope level of the analogy. Analogies depend on similarities, known and inferred, and usually the similarities can have scope levels and specific goals. We have the category or group we want to elucidate, the target domain, and that domain we build the analogy upon, the source domain (Bartha, P. Analogy and Analogical Reasoning// Zalta, E. The Stanford Encyclopedia of Philosophy. 2019, URL: https://plato.stanford.edu/archives/spr20 19/entries/reasoning-analogy/). Typically, philosophers of sound take sound and auditory experience as the target domain, whereas vision and colour is the source one.

[20] Pasnau, R. What Is Sound?// The Philosophical Quarterly, 1999, Vol. 49, No. 196 P. 309-324

[21] Kulvicki, J. The Nature of Noise // Philosopher's Imprint, 2008, Vol. 8, No. 11 P. 1-16; Kulvicki J. Sound Stimulants.// Stokes, D., Matthen, M. Biggs, S. (eds.) Perception and its Modalities, Oxford: Oxford University Press, 2014 P. 205-221

[22] Roberts, P. Turning up the Volume of the Property View on Sound// Inquiry, 2017, Vol. 60, No. 4 P. 337-357

[23] Cohen, J. Sounds and Temporality// Zimmerman, D. (Ed.). Oxford Studies in Metaphysics, Vol. 5. Oxford: Oxford University Press, P. 303-320

[24] Casati, R., Dokic, J. Sounds// Zalta, E. Stanford Encyclopedia of Philosophy, 2014 URL: https://plato.stanford/archives/fall2014/ entries/sounds/; O'Callaghan, C. Hearing Properties, Effects or Parts? // Proceedings of the Aristotelian Society, New Series, Vol. 111 (2011), pp. 375-405

Roberts identifies at least two meanings pertaining vibrations vs. wave dispositionalism.

It has been noticed, however, that sound dispositionalism has not delved further on the philosophy of dispositions, and that such suggestions (not developed programs so far) heavily rely on the conditional analysis,[25] which has been under criticism for the last thirty years. This renders, again, a case of conceptual underspecification. In this fashion, the project of sound dispositionalism is advanced.

The proposal of conditional analysis has several problems. The first one is that it allows myriad counterexamples: masks, mimics, finks, where the manifestation could be halted by some device, or simulated, or emulated by other things that are supposed to be its stimulus. Likewise, it is context-sensitive. Take 'fragility', for instance, you would not say a "rock is fragile", yet a rock could break, were it put under a significant amount of force. It seems, then, that there is a whole spectrum where objects could break, but dispositions only pick a part of it. Contrary to this, Barbara Vetter proposes the notion of potentiality, which would cover the whole spectrum for any object.[26] In addition, Vetter[27] also theorises on the possibility of addressing the interaction of different potentialities, hence the idea of joint potentialities. This seems to contribute to our case in a significant manner. The acoustic potentiality of an object can be framed as sonority or audibility. These concepts are extensionally equivalent, but have a different sense: the first is purely objectual, whereas the second refers to its perceivability by a human subject. Likewise, a hearer can be considered to have a "hearing capacity", as it is addressed by audiology.[28]

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[25] Lewis, D. Counterfactuals. Massachusetts: Blackwell1973; Lewis, D. On the Plurality of Worlds. Oxford: Blackwell,1986

[26] Vetter, B. Potentiality, from dispositions to modality. Oxford: Oxford University Press, 2015.

[27] Vetter, B. Perceiving Potentialities: A Metaphysics for Affordances// Topoi, 2020, Vol. 39, No. 5 P. 1177-1191

[28] Parker, J., Parker, P. Audiology, A Medical Dictionary, Bibliography, and Annotated Research Guide to Internet References. San Diego: ICON, 2004

Furthermore, the proposal of considering sounds as events has the virtue of encompassing a big variety of aspects and interactions.[29] However, a first aspect to notice is that, in the philosophy of events, there is a significant discussion concerning the relation of metaphysics and semantics.[30] With sounds, we find a situation similar to those of properties: that the sentences that typically render events in the case of sounds are somewhat concealed.

Considering the overall philosophy of events allows us to pay attention to problems that are important in the philosophy of sound like those of identity, individuation or repetition.[31] The problem of sound individuation, 'infamously difficult to resolve',[32] for instance, shows that there are several topics to cover, from individuation puzzles even to the distinction between count and mass terms.[33]

On the other hand, this reconsideration also shows the perils of being an EV-theorist. This is so due to the debates revolving around the very category of 'event'. This opens the gates to object reductionism and property reductionism. The first one, derived from Quine,[34] would claim that events are reducible to objects. Interestingly, this would render an "Object view", on which sounds would be objects, a position no one

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[29] O'Callaghan, C. Sounds, a Philosophical Theory // Oxford: Oxford University Press, 2007; O'Callaghan, C. Sounds and Events// Nudds, M. and O'Callaghan, C. (eds.). Sounds and Perception, New Philosophical Essays, Oxford: Oxford University Press, 2009 P. 26-49; O'Callaghan, C. Hearing Properties, Effects or Parts? // Proceedings of the Aristotelian Society, New Series, Vol. 111 (2011), pp. 375-405; Casati, R. Dokic, J. Di Bona, E. The Ockhamization of the event sources of sound // Analysis, 2013, Vol. 73, No. 3 P. 462- 466; Scruton, R. Sounds as Secondary Objects and Pure Events // Nudds, M., O'Callaghan, C. Sounds and Perception, Oxford: Oxford University Press, 2009 P. 50-68; Scruton, R. Hearing Sounds// Zimmerman, D. (ed.), Oxford Studies in Metaphysics, Vol. 5, Oxford, Oxford University Press, 2010 P. 271-278; Leddington, J. Sounds Fully Simplified // Analysis, 2008, Vol. 79, No. 4 P. 621-629; Leddington, J. The Event-Property View of Sounds (manuscript). 2021

[30] Vendler, Z. Verbs and Times// The Philosophical Review, Vol. 66, No. 2, P. 143-160; Davidson, D. The Logical Form of Action Sentences// Rescher, N. (ed.), The Logic of Decision and Action, Pittsburgh: University of Pittsburgh Press, P. 81–95; Mourelatos, A. Events, Processes and States// Linguistics and Philosophy, 1978, Vol. 2, No. 3, P. 415-434; Bennett, J. Events and Their Names, Oxford, Oxford University Press, 1988.

[31] Dokic, J. Two Ontologies of Sound// The Monist, 2007, Vol. 90, No. 3, P. 391-402

[32] O'Callaghan, C. Sounds, a philosophical theory. Oxford: Oxford University Press, P. 67

[33] Méndez-Martínez, J.L. What Counts as "a" Sound and How "to Count" a Sound. The Problems of Individuating and Identifying Sounds// Synthesis Philosophica, 2019, Vol. 67, No. 1, P. 173-190

[34] Quine, W. Word and Object. London: MIT Press

in the contemporary debate on sounds holds. Property reductionism, on the other hand, has Roderick Chisholm and Richard Montague as its representatives,[35] where events would be universals. One of the issues allowing this interpretation is the perplexity of the idea of repetition. The idea is that particulars cannot be repeated, but events (and arguably sounds) can, so events should be taken as properties.

Another issue to inspect is that of mereology. Usually, events are poorly portrayed mereologically.[36] The best understanding is that of Bernard Mayo[37] and his complementary thesis, on which objects and events offer complementary features: objects occupy space, events occupy time; objects move, events propagate, and so forth. Additionally, one of the features that sounds would have by presenting them as events is that they do not move, since, according to Dretske, events do not move (hence Dretke's dictum).[38]

The fact of there being several positions concerning the location of sound (proximal, medial, distal and aspatial) emphasises the importance of considering not only its location, but the spatial phenomenological content of audition. In this sense, the inquiries can be divided into two different (yet intertwined) inquiries: where are sounds (a metaphysical question), and where we perceive them to be (the phenomenological one).

Apparently, nobody discusses whether sounds are temporally extended or not. However spatiality is thornier. For now, it is interesting that this affects directly the non-property theories. O'Callaghan is right in claiming that 'Eventness' (the category-exceptionality argument for Events) would clarify this to some extent since events relate differently to space than objects. However, it would be false to say that events

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[35] Chisholm, R. Events and Propositions // Noûs, 1970, Vol. 4, No. 1 P. 15–24; Montague, R. On the Nature of Certain Philosophical Entities// The Monist, 1969, Vol. 53, No. 2 P. 159–194

[36] Casati, R. Varzi, A. Parts and Places: The Structures of Spatial Representation. London: MIT Press

[37] Mayo, B. Objects, Events and Complementarity // The Philosophical Review, 1961, Vol. 70, No. 3 P. 340-361

[38] Dretske, F. Can Events Move?// Mind, 1967, Vol. 76, No. 304 P. 479-492

do lack spatial extension. It is rather that their boundaries and topological consistency are quite different than those of objects.

The relationship between space and sound has led to a heated debate concerning epistemological and metaphysical claims. A known position in this sense is that of scepticism, which is, presumably, a scepticism on whether sounds are spatial entities or not (metaphysical claims); and on whether we can perceive sound's location, or not (epistemic claims). Three influential sources appear constantly in the literature. Peter Frederick Strawson, Brian O'Shaughnessy, and Matthew Nudds. More thoroughly, we can focus on Strawson,[39] concerning his famous thought experiment of a "purely auditory world"; another representative is Brian O'Shaughnessy[40] and his queries on the problem of sounds' locality; and, finally, we turn Matthew Nudds's[41] ideas on auditory perception, who has worked extensively on sounds, auditory experience and its connection to space.

Concerning logical representation, the expression "logic of sound" indicates at least two different things. The first refers to the inherent logical structure of either sound or its manifestations, for example, music.[42] The second is allusive to the use of sound for logical diagrams *à la* Peirce.[43] In short, we would have a logic inherent to sound;

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[39] Strawson, P.F. *Individuals, an Essay in Descriptive Metaphysics*. London: Methuen, 1959

[40] O'Shaughnessy, B. The Location of Sound//Mind, 1957, Vol. 55, No. 264 P. 471-490; O'Shaughnessy, B. Consciousness and the World// Oxford: Oxford University Press, 2000; O'Shaughnessy, B. The location of perceived sound// Nudds, M. O'Callaghan, C. Sounds and Perception, New Philosophical Essays, Oxford: Oxford University Press, 2009 P. 111- 125

[41] Nudds, M. Sounds and Space// Nudds, M. O'Callaghan, C. Sounds and Perception, New Philosophical Essays, Oxford: Oxford University Press, 2009 P. 69-96; Nudds, M. What are Auditory Objects, Review of Philosophy and Psychology, Vol. 1, No. 1, 2010, P. 105-122

[42] Langer, S. A Set of Postulates for the Logical Structure of Music// The Monist, 1929, Vol. 39, No. 4, P. 561-570; Dipert, R, Whelden, R. Set-Theoretical Music Analysis, The Journal of Aesthetics and Art Criticism, 1976, Vol. 35, No.1, P. 15-22; Dipert, R, Whelden, R. Set-Theoretical Music Analysis II// Indiana Theory Review, 1978, Vol. 1, No. 2, P. 50-60; Forte, A. The Structure of Atonal Music,//New Haven: Yale University Press, 1973; Ingolf, M. A Molecular Logic of Chords and their Internal Harmony// Logica Universalis, Vol. 12, No. 1-2, P. 239-269

[43] Champagne, M. Sound Reasoning (Literally): Prospects and Challenges of Current Acoustic Logics// Logica Universalis, 2015, Vol. 9, No, 3, P. 331-343; Pietarinen, A. "Is non-visual diagrammatic logic possible?// Pombo, A. Gerner, O. Studies in Diagrammatology and Diagram Praxis, College Publications, London, 2010, P. 73–81

and a logic by means of sound. We can call the first case a "casuistic" approach; whereas the second, "instrumental". A general goal of this research is to create a connection between the proposals around acoustic logic, on the one hand, and the philosophy of sound and auditory experience, on the other. This involves various tasks: that of systematisation around the various acoustic logics, as well as pointing out their mutual compatibilities and inconsistencies.

Finally, auditory (or aural) perception is one of the main concerns in the philosophy of sound. This stage of the literature revolves around the admission of diverse objects and contents for audition. The distinction between both terms is generally confusing. This is a fairly developed topic when it comes to visual experience.[44] There are several candidates for this: sounds themselves, causes, audible qualities (loudness, pitch, and timbre);[45] silence;[46] echoes;[47] locations and space;[48] music;[49] meanings;[50] the gender

[44] For example: Siegel, S. How can we discover the contents of experience?// Southern Journal of Philosophy, 2007, Vol. 45, S. 1, P. 127-142; Siegel, S. The Contents of Visual Experience. New York: Oxford University Press, 2010

[45] Deutsch, D. Grouping Mechanisms in Music// Deutsch, D. (ed.) *The Psychology of Music*. Amsterdam: Elsevier, 2013 P. 183-248; Di Bona, E. Some Considerations on Pitch// Phenomenology and Mind, 2013, Vol. 4 P. 244-54; Heller, E. Why You Hear What You Hear, an Experimental Approach to Sound, Music, and Psychoacoustics. New Jersey: Princeton University Press, 2013; Nussbaum, C. Musical Perception// Matthen, M. The Oxford Handbook of Philosophy of Perception. Oxford: Oxford University Press, 2015 P. 496- 515; Oxenham, The Perception of Musical Tones// Deutsch, D. (ed.) *The Psychology of Music*. Amsterdam: Elsevier, 2013 P. 1-33

[46] Sorensen, R. Hearing Silence: The Perception and Introspection of Absences// Nudds, M. O'Callaghan, C. Sounds and Perception: New Philosophical Essays. Oxford: Oxford University Press, 2009 P.. 126-145; Phillips, I. Hearing and Hallucinating Silence// Macpherson, F., Platchias, D. (eds.) Hallucination, Philosophy and Psychology. Cambridge: MIT Press P. 333-360; Meadows, P. Experiencing Silence, Canadian Journal of Philosophy, Vol. 59, No. 2, P. 238-250

[47] O'Callaghan, C. Echoes// The Monist, 2007, Vol. 90, No. 3 P. 403- 414; Fowler, G. Against the Primary Sound Account of Echoes// Analysis, Vol. 73, No. 3 P. 466-473

[48] O'Callaghan, C. Perceiving the Locations of Sounds// Review of Philosophy and Psychology, 2010, Vol. 1, No. 1, P. 123-140; Young, N. Hearing Spaces// Australasian Journal of Philosophy, 2017, Vol. 95, No. 2, P. 242-255

[49] Scruton, R. Sounds as Secondary Objects and Pure Events// Nudds, M., O'Callaghan, C. Sounds and Perception: New Philosophical Essays. Oxford: Oxford University Press, P. 50-68; Scruton, R. Hearing Sounds// Zimmerman, D. (ed.), Oxford Studies in Metaphysics, Vol. 5, Oxford: Oxford University Press, 2010, pp. 271-278; Leddington, J. Sonic Pictures// Journal of Aesthetics and Art Criticism, forthcoming.

[50] Mole, C. The Motor Theory of Speech Perception// Nudds, M. O'Callaghan, C. Sounds and Perception: New Philosophical Essays. Oxford: Oxford University Press, 2009 P. 211-233; O'Callaghan, C. Speech Perception"// Matthen, M. (ed.). The Oxford Handbook of the Philosophy of Perception. Oxford: Oxford University Press, P. 476-495; O'Callaghan, C. Beyond vision, Philosophical Essays// Oxford: Oxford University Press, 2017.

of voices (for instance, male, female, androgynous).[51] But there is no systematic discussion on what qualifies as an object and what as content. This has epistemological importance, which also relates to that of direct and indirect perception.

Findings to be defended

The conclusions to be defended are the following:

1. In order to choose among the available philosophical theories of sound, we have to systematise and reconstruct its desiderata and to understand what is the analogical reasoning that underpinned the competing approaches. In this work, we propose their classification and comparison on the basis of their central analogy (e.g. whether sounds can be understood by analogy with objects, as sensory data, etc).

2.. New approaches for PV theories have been proposed. In the case of PV1 theories, it has diverse theoretical paths for its development, for instance *sense-data* or adverbialist theories. Beyond the realm of analytic philosophy, Husserl's phenomenology can also be seen as a contribution to PV1 theories. In the case of PV2 theories, they can be benefited from the new developments in the metaphysics of dispositions of powers.[52] It is argued that the theories according to which "sounds are properties" are feasible and can b e further advanced. The problem is not that those theories present a false claim (i.e. "sounds are properties"), but rather that they present an *incomplete* account of sound. According to the syncretic view defended here, properties have to do with the phenomenon of sound, but they are just a part of it.

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[51] Di Bona, E. Towards a rich view of auditory experience// Philosophical Studies, 2019, Vol. 174, No. 11 P. 2629-2643

[52] For instance: Vetter, B. Potentiality, from dispositions to modality. Oxford: Oxford University Press, 2015; Vetter, B. Perceiving Potentialities: A Metaphysics for Affordances// Topoi, 2020, Vol. 39, No. 5 P.. 1177-1191.

3. The interpretation of sounds as events is problematic in diverse ways. Two reasons are worth underlining. The first one is concerned with the reductionist strategy for sound, As proposed by Casati, Dokic and Di Bona.[53] There are other reductionist ways, and not very promising, that could be a negative consequence of the Ochkamisation strategy. Property and Object reductionism had not been considered before. The second problem that EV faces is that of misunderstanding the relationship between objects and events as that of an opposition, while it is more fruitful to represent it as a composition relation, i.e.: objects compose events. It is finally noticed that the tension between visually perceiving objects, and auditorily perceiving events affects the very metaphysical categories of "object" and "event".

4. Sounds are dynamic: they do not have stable locations, even if their movements are not captured in our experience. This is due to the fact that perception itself is an interpretation of the distal world derived from proximal stimulation. Auditory perception, In particular, interprets the dynamic states of things and their environment. It is a mistake to assume that sounds are stably located in one particular place, because they report us directly (but approximately) what is happening in a larger spatial segment, and they do this because they are dynamic and unstable. The problem of *spatial segmentation* is solved by the idea of sounds being dynamic.

5. It is possible to build the logic of sound. From the point of view of the diagrammatic approach, acoustic tools can be used to construct propositional calculus. In addition, acoustic mereotopology shows that it is possible to express mereological relations also by purely acoustic means without using visual or graphic symbols. This approach has great potential for application to other areas of logic (set theory, predicate logic, etc.).

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[53] Casati, R. Dokic, J. Di Bona, E. The Ockhamization of the event sources of sound // Analysis, 2013, Vol. 73, No. 3 P. 462- 466

6. Sound has epistemological relevant features. In comparison with the epistemology of visual perception, the epistemology of auditory perception was poorly developed and not systematised. An example of this is the lack of distinction between object and perceptual content. In this sense, the proposal of various candidates for the role of objects or contents for auditor experience had not been previously systematised.

Theoretical and practical value of the research

The findings of this research can be used in preparing pedagogic materials (for example course) in diverse fields: metaphysics, philosophy of perception, and epistemology.

It can also be used as an updated general approach to the philosophical discussion on sound and audition.[54]

The scientific novelty of the research

A Comprehensive analysis of the philosophical discussion on sound, the most comprehensive one to date, is undertaken. It covers several areas not explored before, such as:

- Within PV, the following approaches were proposed: an adverbialist theory of sound[55]; a sense-data theory of sound[56]; a Husserlian phenomenology of sound[57]; a dispositional theory of sound.[58]

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[54] Even with a larger scope tan the following works: O'Callaghan, C. Sounds. PhD Thesis, New Jersey: Princeton University, 2002; O'Callaghan, C. Sounds, a philosophical theory. Oxford: Oxford University Press, 2007; Casati, R., Dokic, J. La philosophie du son. Nîmes: Editions Jacqueline Chambon, 1994; Casati, R., Dokic, J.Sounds// Zalta, E. Stanford Encyclopedia of Philosophy, URL: https://plato.stanford/archives/fall2014/ entries/sounds/; Di Bona, E., Santarcangelo, V. Il suono, L'esperienza uditiva e i suoi oggetti, Milan: Rafaello Cortina, 2018.

[55] Adverbial theories of perception hold that we do not perceive a red and round object but there are states, ascribable to the perceiving mind, of 'redness' and 'roundness'. Chisholm, R. Perceiving, a Philosophical Study. New York: Cornell University Press, 1957.

[56] Sense-data are entities of a mental kind, but it is inaccurate to say that they are raw sensations. The relational principle indicates that they do have a relation with external objects. Sense-data theorists hold that they are the immediate objects of perception. What has been contested, ever since its

- The proposal of a mereotopological understanding of sound and the construal of an acoustic mereotopology. Although this was an existing concern in the literature, nobody had committed to a formal approach to sound from the lens of mereology and topology.
- An epistemology of auditory perception is proposed and reconstructed. Within the framework of this approach, the differences between the available objects and contents of perception are systematised and their hierarchies are revealed. Furthermore, this epistemology offers a formal approach to the dynamic aspects of listening and explicates the differences between auditory perception and other sense-modalities (for instance, visual perception).

Approval of the research

- "On What there is Not", Meetings at the group of Formal Philosophy, NRU-HSE, Moscow, Russian Federation, 21th of March of 2017

- "From additional sense modalities to Animal Aesthetics", The English Philosophy Colloquium, NRU-HSE, Moscow, Russian Federation, 23 of June of 2017

-"The Problems of Individuating Sound", The English Philosophy Colloquium, NRU-HSE, Moscow, Russian Federation, 26 of January of 2018

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formulation, is its mental character. See: Russell, B. Problems of Philosophy. London: Oxford University Press, 1912; Jackson, F. Perception, A representative theory. Cambridge: Cambridge University Press, 1977.

[57] This interpretation is also novel in the literature because, in opposition to that of Roberto Casati, it focuses on the inner perception of time. Casati, R. Casati, R. Considerazioni Critiche Sulla Filosofia del Suono di Husserl // Rivista di Storia della Filosofia, 1989, Vol. 44, No. 4 P. 725-743; Méndez-Martínez, J.L. The Brentano-Husserl Analysis of the Consciousness of Time and Sound Ontology// Horizon, 2020, Vol. 9, No. 1 P. 184-215

[58] Unlike to previous versions of the theory, the proposal made here considers the new developments in the metaphysics of dispositions and potencies, which is itself a novel contribution for both the philosophy of sound and the metaphysics of dispositions. In particular, we have to underline the inclusion of the notion of "potentiality", which is independent of Lewis's conditional analysis and it is not context-sensitive, as the first proposal of "disposition". This is also addressed here: Méndez-Martínez, J.L. If Sounds were Dispositions, a Framework Proposal for an Undeveloped Theory// Organon F, Vol. 27, No.4 P. 446-479; see also: Vetter, B. Potentiality, from dispositions to modality. Oxford: Oxford University Press, 2015.

-"If Sounds were Dispositions", Colloquium of Theoretical Philosophy (Kolloquium zur theoretischen Philosophie) at the *Institut für Philosophie* of the Freie Universität-Berlin, Berlin, Germany, 7 of December 2018

-"Impossible Authorships", International Conference "Issues on the (Im)possible", Slovak Academy of Sciences, Bratislava, Slovakia, 3 of August 2018

-"Sounds, Dispositions and Perception", Scientific Research Seminar (Научный Исследовательский Семинар), NRU-HSE, Moscow, Russian Federation, 3 of April of 2019.

-"Strawson on Sounds", International Conference "Ways of Thinking, Modes of Speaking" ("Способы мысли, пути говорения"), NRU-HSE, Moscow, Russian Federation, 25 of April 2019

-"Acoustic Mereotopology", International conference "Formal Philosophy", NRU-HSE, Moscow, Russian Federation, 28 of June 2019

-"Acoustic Mereotopology", Meetings at the group of Formal Philosophy, NRU-HSE, Moscow, Russian Federation, 9th of November of 2020

Main contents of the dissertation

Introduction. Here the main topics of the discussion are presented. As a starting point it addresses the "scientific picture" of sound, concerning the elements of the view according to which sounds are pressure waves. In so doing, it distinguishes between longitudinal and transversal pressure waves, it describes the elements of waves (namely, wavelength, period and amplitude); it describes the phenomena of rarefaction and compression; it takes into account the behaviours of wave, such as rarefaction, transmission, reflection, diffraction and scattering. Finally, it explains the phenomena of interference of waves.

Chapter 1, Questions, metaphilosophy and theory choice

This chapter's contention is to set forth the metaphilosophical framework for the research and learn whether a theory choice among the views that dispute over the nature of sound, its topology and causality is feasible, and how shall we proceed with

that choice. It is argued that the philosophy of sound and auditory perception does not present a theory-choice type of situation, but rather a dispute concerned with an analogy-choice. The hypothesis is that the chosen analogy is a main cause for confusions and disagreements throughout the philosophy of sound.

§1. A web of questions. This section displays the main questions of the discussion: topological, ontological and causal. It queries the problem of interconnection among those questions, by invoking Quine's and Ullian's "Web of Beliefs" and Edmund Husserl's "interconnection of truths".[59]

§2. Taxonomies in the philosophy of sound and auditory perception. The main distinction between sound as perceived ($sound_1$) and sound as a pressure wave ($sound_2$) is introduced. It investigates the consequences of not making the distinction and the disciplinary background of both definitions. This section also addresses the existing taxonomies in the philosophy of sound and auditory experience: the ontological taxonomy[60] concerned with the nature of sound; the topological taxonomy[61], concerned with the location and spatial structure of sound. This section stresses the inconsistencies of maintaining both $sound_1$ and $sound_2$, and particularly the problems of thinking of sounds as pressure waves. Among these problems, an emphasis is made concerning the "Error Theory" of perception: if sounds were waves they would be in the medium, *but we do not perceive them to be in the medium but at their sources*. It also addresses the problem of *category-preference* arguments.[62]

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[59] Quine, W.V.O., Ullian J. The Web of Belief// Pennsylvania, McGraw Hill. 1978; Husserl, E. Logische Untersuchungen, Hamburg, Felix Meiner. 1984

[60] O'Callaghan, C. Sounds, a Philosophical Theory // Oxford: Oxford University Press. 2007; O'Callaghan, C. Constructing a Theory of Sounds // Zimmerman, D. (ed.), Oxford Studies in Metaphysics, Vol. 5, 2010, Oxford, Oxford University Press P. 247-270

[61] Casati, R., Dokic, J. Sounds// Zalta, E. (ed.) The Stanford Encyclopedia of Philosophy, 2014, URL: https://plato.stanford/archives/fall2014/ entries/sounds/

[62] These are arguments where the exclusivity of features is held in order to distinguish among classes and its potential members, for example: if sounds have property-like features, then surely they are not particulars; or, if sounds have particular-like features, then surely they are not properties.

§3. Relation to sources. This section analyses the different positions referring to the relationship between sounds and their sources. It investigates the so-called "Berkeleyan view",[63] which encompasses the following theses: "sounds is the object of hearing" (the "Proper Sensible Thesis"), "sound is the *direct* object of hearing" (the "Direct Thesis"), and "sound is independent and/or different from its sources" (the "Independence Thesis").There are six ways to understand the relationship between sounds and their sources: causality (a sound is "the effect" of an event; the event is "the cause" of a sound), bearing (e.g. events 'bear' sound, objects 'bear' sound, sound 'bears' audible qualities, etc.), parthood (sounds are parts of the events), identity (the sounding events and the events that are thought to be their causes are one and the same thing), audibilia (sounds are pure objects of hearing no holding relationship to its sources), and testimony (sounds testify the events that produce them).[64] In examining these relations to sources, a key issue is that of the direct or indirect relation between sounds, events and sources, for instance deciding whether we hear events through sounds or we hear events directly and so forth.

§4. From scientific to philosophical claims. This section argues that there are two concepts of sound at the core of the discussion: a physicalist conception, on the one hand; and a psychological one. This calls for a metaphilosophical consideration[65] of the disciplinary boundaries where both notions are originated. The examination of the disciplinary boundaries underlines the conceptual exchanges between disciplines ("interdisciplinary exchange), philosophical traditions (inter-traditional exchange), and discussions within traditions ("inter-discussional"). This section also pays attention to the difference between philosophical and scientific claims, particularly concerning the case of sound.

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[63] Leddington, J. What We Hear// Brown, R. (ed.) Consciousness Inside Out: Phenomenology, Neuroscience, and the Nature of Experience, Netherlands: Springer, 2014 P. 321-334

[64] This is partially based on: Leddington, J. Sonic Pictures // Journal of Aesthetics and Art Criticism, (Forthcoming)

[65] For example: Cappelen, H. Philosophy Without Intuitions// Oxford: Oxford University Press, 2012; Williamson, T. The Philosophy of Philosophy, Oxford: Blackwell, 2007.

§5. Choosing an analogy. This section deals with the analogies that have been used to address sound, such as colour analogy (i.e. "sound is analogous to colour", or "sound::colour"), light analogy (i.e. "sound is analogous to light" or "sound::light"), and so on. It is argued that there is a pervasive and misguided use of analogies, which causes a misinterpretation of the scope level of equivalence among the compared domains.[66] Against this background, a different set of analogies is proposed (the so-called "right analogy"): space::time; object::event; vision::audition; light:: acoustic wave; easy access to perceived space:: easy access to perceived time; auditory images:: sound; visual features (colour, shape, size):: audible features (timbre, pitch, shape); colour::timbre; darkness::silence; photograph::recorded sound.

§6. Desiderata for the philosophy of sounds. This section pays attention to the actual desiderata that different authors have abided by, ranging from scientific to phenomenal, and linguistic adequacies.[67]It also takes into account typical desiderata, such as accuracy, scope, simplicity, fruitfulness, falsifiability and explanatory parsimony. Concerning the *desiderata* actually employed in the discussion, it considers the phenomenal adequacy desiderata as the bone of contention between different philosophical theories. It also describes the main problems in the philosophy of sound, namely, conceptual underspecification, ontological reduction and spatial segmentation. The proposal of a syncretic view is put forward.

Chapter 2, If sounds were properties, exploring PV

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[66] Bartha, P. Analogy and Analogical Reasoning // Zalta, E. (ed.), *The Stanford Encyclopedia of Philosophy*, 2019 URL: https://plato.stanford.edu/archives/spr20 19/entries/reasoning-analogy/; Mayo, B. Objects, Events and Complementarity // The Philosophical Review, 1961, Vol. 70, No. 3 P. 340-361; Urmson, J. The Objects of the Five Senses // Proceedings of the British Academy, 1968, Vol. 54, P. 117-131

[67] It also compares them to classic desiderata in the philosophy of science, for instance: Kuhn, T.S. The Essential Tension, Selected Studies in Scientific Tradition and Change. Chicago: The University of Chicago Press 1977 P. 220- 239; Kuhn, T.S. Rationality and Theory Choice// The Journal of Philosophy, 1983, Vol. 80, No. 10, P. 563-570; Popper, K. Conjectures and Refutations, The Growth of Scientific Knowledge// New York: Basic Books 1963; Popper, K. The Logic of Scientific Discovery// London: Routledge. 2002

This chapter analyses the theories within the Property View. It argues that both PV1 and PV2 theories can be advanced and formulated in feasible terms (for example adverbialism, sense-data theories, Husserlian phenomenology and dispositionalism), yet they aren't exempt from being subject to some of the main criticisms mentioned before, namely, conceptual underspecification and ontological reduction.

§1. Property underspecification. This section focuses on the conceptual issues around the "property" category. In so doing, it elucidates the problem of property-ascription. It also addresses the main discussions around the metaphysics of properties —that is the discussion around universals/particulars/tropes; categorical/dispositional; contingent predication/necessary predication—, in order to learn its connection to property theories for sound.[68] It also pays attention to the fact that sound already "has" properties, namely timbre, loudness and pitch.

§2. Property View 1: Sounds as sensations. This section proposes two feasible candidates for a sensational approach to sound within the analytic tradition: adverbialism in the spirit of Roderick Chisholm[69] and sense-data theories in the formulation of Frank Jackson.[70] The so-called "auditory adverbialism" supposes that auditory objects are sensations that can be grammatically formulated as adverbs; sense-data theories, in Jackson's formulation, is a response to adverbialism by arguing that it cannot spatially individuate the sensations, this is the "many Property" problem. It is argued that in the current literature on sound, these differences are largely ignored.

§2.1 Husserl's analysis of the inner consciousness of time (*Zeitbewusstseins*). This section proposes that Edmund Husserl's[71] phenomenological approach to the inner consciousness of time can be taken as a possible candidate for Property Theories,

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[68] Armstrong, D. Four Disputes About Properties// Synthese, 2005, Vol. 144, No. 3 P. 309-320

[69] Chisholm, R. Perceiving, a Philosophical Study. New York: Cornell University Press, 1957

[70] Jackson, F. Perception, A representative theory. Cambridge: Cambridge University Press, 1977

[71] Husserl. E. Vorlesungen zur Phänomenologie des inneren Zeitbewusstseins. Halle: Max Niemeyer, 1928

especially the so-called "retentional model". It contrasts two readings for Husserl's philosophy of sound, those of Roberto Casati [72] and Méndez-Martínez. [73] This examination has two benefits: it allows to fix the scope of the phenomenal adequacy *desideratum*, by only narrowing it to the perceived sound; and it discovers that, thanks to the retentional model, sound has codified temporal structure.

§3. Property View 2, sounds as properties of the (sounding) objects. This section pays attention to those who actually have defended a property view account, an object-based one, namely, PV2.[74] It investigates the fact that most authors working in this direction defend an account on which sounds are dispositional properties of objects, that is, properties that only manifest under certain conditions and if the right stimulus triggers the manifestation of that property.

§3. 1 Sounds as dispositional properties. This section advances the known theory of sounds as dispositional properties and develops new arguments concerning the state-of-art discussion in the metaphysics of dispositions, that of 'potentiality'.[75] In so doing,

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[72] Casati, R. Considerazioni Critiche Sulla Filosofia del Suono di Husserl // Rivista di Storia della Filosofia, 1989, Vol. 44, No. 4 P. 725-743

[73] Méndez-Martínez, J. L. The Brentano-Husserl Analysis of the Consciousness of Time and Sound Ontology // Horizon, 2020, Vol. 9, No. 1 P. 184-215

[74] Cohen, J. Sounds and Temporality // Zimmerman, D. (ed.) Oxford Studies in Metaphysics, Vol. 5, Oxford: Oxford University Press, 2010 P. 303-320; Kulvicki, J. The Nature of Noise // Philosopher's Imprint, 2008, Vol. 8, No. 11 P. 1-16; Kulvicki J. Sound Stimulants// Stokes, D., Matthen, M. Biggs, S. (eds.) Perception and its Modalities, Oxford: Oxford University Press, 2014 P. 205-221; Leddington, J. What We Hear// Brown, R. (ed.) Consciousness Inside Out: Phenomenology, Neuroscience, and the Nature of Experience, Netherlands: Springer, 2014 P. 321-334; Leddington, J. Sounds Fully Simplified // Analysis, 2008, Vol. 79, No. 4 P. 621-629; Leddington, J. The Event-Property View of Sounds (manuscript). 2021; Leddington, J. Sonic Pictures// Journal of Aesthetics and Art Criticism (forthcoming); Méndez-Martínez, J.L. If Sounds Were Dispositions, a Framework Proposal for an Undeveloped Theory// Organon F, Vol. 27, No. 4, P. 446-479; Pasnau, R. What Is Sound?// The Philosophical Quarterly, 1999, Vol. 49, No. 196 P. 309-324

[75] Bird, A. Dispositions and Antidotes// The Philosophical Quarterly, 1998, Vol. 48, No. 191 P. 227- 234; Bird, A. Nature's Metaphysics, Laws and Properties, Oxford: Oxford University Press, 2007; Vetter, B. On Linking Dispositions and Which Conditionals?// Mind, 2011, Vol. 120, No. 480 P. 1173- 1189; Vetter, B. Recent Work: Modality Without Possible Worlds// Analysis, 2011, Vol. 71, No. 4, P. 742- 754; Vetter, B. 'Can' Without Possible Worlds: Semantics for Anti-Humeans// Philosophers' Imprint, 2013, Vol. 13, No. 16, P. 1-27// Vetter, B. Multi-Track Dispositions// The Philosophical Quarterly, 2013, Vol. 63, No. 251 P. 330- 352; Vetter, B. Potentiality, from dispositions to Modality. New York: Oxford University Press, 2015; Vetter, B. Perceiving Potentialities: A Metaphysics for Affordances// Topoi, Vol. 39, No. 5 P. 1177-1191

it critically reconstructs Lewis's conditional analysis, which has been the argument used by the philosophers of sound, and stresses its main complications, such as the fact that dispositions are context-sensitive and depend on causal mechanisms that can be prevented or halted on certain circumstances. In that sense, Vetter's proposal of potentiality points to dispositional properties that are had by the objects *all the time* and in *every circumstance*, among other advantages. This proposal is applied, and enhanced, for the case of sound.

§4. Objections against Property views, known and new. This section makes a balance of the theory in considering known and potential objections. It considers the objections known as "Particularity",[76] which is the one used in the literature, as well as new problems. It also considers newer and more systematic objections concerning the criterion of falsifiability (not considered before in the literature on sounds), as well as other counter examples to the idea of sound as a dispositional property.

Chapter 3. If sounds were events.

The goal of this chapter is to assess the theory known as "Event-View" and to contrast it with the known literature from the metaphysics and semantics of events. It especially emphasises the problem of reductionism. It also pays special attention to the difference between objects and events.

§1. A category issue. This section reviews the category-preference arguments as used to favour EV-theories. It starts by contrasting to the differences between the metaphysical categories of "object" and "event", as well as the category-preference arguments used for each of those categories.

§2. Ontology and semantics. This section considers the main divide in the philosophy of events, that between semantics and ontology. This divide is usually not attended in

[76] O'Callaghan, C. Hearing Properties, Effects or Parts? // Proceedings of the Aristotelian Society, New Series, Vol. 111 (2011), pp. 375-405

the philosophical discussion on sounds. In order to overcome this state of affairs of negligence, this section pays attention to the difference between events and states of affairs with a special emphasis on the composition of event-sentences. Afterwards, it also investigates the place of sound in event-sentences.[77]

§3. Reductionist strategies. This section analyses the pros and cons of the reductionist strategies in the literature. It also visits Bernard Mayo's thesis of complementarity between objects and events.[78]

§3.1 Object reductionism (and other relations between objects and events). This section analyses the reductionist strategy according to which events are types of objects. In so doing, it visits not only the argument itself, but the existing considerations around the category of object (both within and beyond the philosophy of sound).[79] Additionally, it considers the different relations that events have with objects: difference, complement, reduction, and composition. It carefully analyses these alternatives, with a special emphasis on Mayo's complement relationship, which has been dominant in the literature.[80] It also considers Dretske's dictum according to which events cannot move.[81] The section finally considers the transitivity aspect of object-reductionism: if sounds are events, and events are objects,[82] then sounds would

[77] Bennett, J. Events and their Names// Oxford: Oxford University Press. 1988; Davidson, D. The Logical Form of Action Sentences // Rescher, N. (ed.), The Logic of Decision and Action, Pittsburgh: University of Pittsburgh Press, 1967, P. 81–95; Hacker, P. Events, Ontology and Grammar// Philosophy, 1982, Vol. 57, No. 222 P. 477-486; Hendrickson, N. Towards a More Plausible Exemplification Theory of Events // Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition, 2006, Vol. 129, No. 2 P. 349-375; Kim, J. Events: Their Metaphysics and Semantics // Philosophy and Phenomenological Research, 1991, Vol. 51, No. 3, P. 641-646

[78] Mayo, B. Objects, Events and Complementarity // The Philosophical Review, 1961, Vol. 70, No. 3 P. 340-361

[79] Casati, R. Commonsense, Philosophical and theoretical Notions of an Object: Some Methodological Problems // The Monist, 2005, Vol. 88, No. 4 P. 571-599; Casati, R. 2015 "Object Perception"// Matthen, M. The Oxford Handbook of Philosophy of Perception, Oxford: Oxford University Press, 2015, P. 394-405; O'Callaghan, C. Object Perception: Vision and Audition // Philosophy Compass, 2008, Vol. 3, No. 4, P. 803-809; Spelke, E. Principles of Object Perception // Cognitive Science, Vol. 14, 1990 P. 29-56

[80] See for example: Casati, R. Varzi, A. Parts and Places: The Structures of Spatial Representation. Massachusetts: MIT Press, 1999.

[81] Dretske, F. Can Events Move?// Mind, 1967, Vol. 76, No. 304 P. 479-492

[82] Quine, W. V. O. Word and Object. London: MIT Press, 1960

happen to be objects. This would result in the "Object view", an approach no-one in the literature is willing to engage with.

§3. 2 Property reductionism. This section assesses the reductionist strategy according to which events are properties, for example, "properties of intervals of time".[83] It addresses Jaegwon Kim's idea of property-exemplification as well.[84] It analyses the implications this has for sound, in particular Leddington's so-called "Property-Event View", where the property ascription of sound is made not to objects, but to events. [85]

§4. Sound individuation. This section addresses a pressing issue concerning the individuation of events[86] and the individuation of sound,[87] which happens to be connected with sources and the notion of cause. It argues, *contra* O'Callaghan,[88] that EV is not better suited to deal with sound individuation than other perspectives. Several criteria for the individuation of events are considered. For instance, that of Davidson, who stresses the causal nature of events in order to individuate them; that of spatial occupation by John Lemmon,[89] and the one focused on sound by O'Callaghan.

§5. Pessimistic mereology. This section pursues a mereological description of sound according to which there are significant difficulties for a mereological consideration of this phenomenon, especially when applying the mereological postulates, hence the

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[83] Chisholm, R. Events and Propositions // Noûs, 1970, Vol. 4, No. 1 P. 15–24; Montague, R. On the Nature of Certain Philosophical Entities// The Monist, 1969, Vol. 53, No. 2 P. 159–194

[84] Kim, J. Events as Property Exemplifications // Brand, M., Douglas, W. (eds.), Action Theory. Dordrecht: Reidel, 1976 P. 159–177

[85] Leddington, J. Sounds Fully Simplified // Analysis, 2008, Vol. 79, No. 4 P. 621-629

[86] Cleland, C. "On the Individuation of Events"// Synthese, 1991, Vol. 86, No. 2 P. 229-254; Davidson, D. "The Individuation of Events" // Davidson, D. The Individuation of Events// Rescher, N. (ed.), Essays in Honor of Carl G. Hempel, Dordrecht: Reidel, 1969 P. 216–234

[87] Méndez-Martínez, J.L. What Counts as "a" Sound and How "to Count" a Sound// Synthesis Philosophica, 2019, Vol. 67, No. 1, P. 173-190

[88] O'Callaghan, C. Sounds, a Philosophical Theory // Oxford: Oxford University Press, 2007

[89] Lemmon, John. Comments on Davidson's The Logical Form of Action Sentences// Rescher, N. (Ed.). the Logic of Decision and Action. Pittsburgh: Pittsburgh, 1967, P. 96-103

idea of a "pessimistic mereology".[90] It distinguishes three possible mereological approaches depending on which is the object parthood predicates can be ascribed to: process mereology, perceptual object-mereology, and phenomenal mereology. The pessimistic approach is a perceptual object-mereology based on the spatial mereological restriction for events.[91] This restriction could apply also to sounds.[92]

§6. Final assessment on EV. This last section evaluates the main EV-theories in the literature for sound and produces a critical assessment concerning reductionism and the use of Ockham's razor. This entails O'Callaghan's related event theory;[93] O'Callaghan's mereology[94]; Casati's, Dokic's and Di Bona's "Identity thesis";[95] Roger Scruton's pure audibilia;[96] and Leddington's "Property-Event View".[97] It also considers the visual biases on which we compare objects to events.[98] It analyses which should be the limits of the reductionist strategies and the performance of event-statements under the mentioned arguments. In so doing, it also queries the pertinence of the Parsimony *desideratum*.

Chapter 4, Space, scepticism, phenomenology and logical representation

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[90] The mereological test is based on Classical Extensional Mereology, and authors such as the following: Casati, R. Varzi, A. Parts and Places: The Structures of Spatial Representation// London: MIT Press, 1999; Koslicki, K. The Structure of Objects// Oxford: Oxford University Press, 2008; Simons, P. Parts, A Study in Ontology // Oxford: Oxford University Press, 1987.

[91] Wiggins, D. Sameness and Substance. Oxford: Blackwell 1980

[92] Nudds, M. Sounds and Space// Nudds, M., O'Callaghan, C. Sounds and Perception. New Philosophical Essays. Oxford: Oxford University Press, 2009, P. 69-96

[93] O'Callaghan, C. Sounds and Events// Nudds, M. and O'Callaghan, C. (eds.). Sounds and Perception, New Philosophical Essays, Oxford: Oxford University Press, 2009 P. 26-49

[94] O'Callaghan, C. Hearing Properties, Effects or Parts? // Proceedings of the Aristotelian Society, New Series, Vol. 111 (2011), pp. 375-405

[95] Casati, R. Dokic, J. Di Bona, E. The Ockhamization of the event sources of sound // Analysis, 2013, Vol. 73, No. 3 P. 462- 466

[96] Scruton, R. Sounds as Secondary Objects and Pure Events // Nudds, M., O'Callaghan, C. Sounds and Perception, Oxford: Oxford University Press, 2009 P. 50-68; Scruton, R. Hearing Sounds// Zimmerman, D. (ed.), Oxford Studies in Metaphysics, Vol. 5, Oxford, Oxford University Press, 2010 P. 271-278

[97] Leddington, J. Sounds Fully Simplified // Analysis, 2008, Vol. 79, No. 4 P. 621-629; Leddington, J. The Event-Property View of Sounds (manuscript). 2021; Leddington, J. Sonic Pictures// Journal of Aesthetics and Art Criticism (forthcoming)

[98] Skrzypulec, Błażej Visual Endurance and Auditory Perdurance// Erkenntnis, 2020, P. 467-488 (forthcoming); Young, N. Hearing Objects and Events// Philosophical Studies, Vol. 175, No. 11 P. 2931-2950

This chapter addresses two major issues: the spatiality and the logical representation of sound. These are two interconnected issues, since the spatial features of sound have consequences in its formal representation in mereology and topology. In this sense, the chapter is divided into three parts: the first one is devoted to the discussion about the spatial characteristics of sound, or lack thereof (sections §1 and §2). The second and third part are devoted to two different approaches to the "logic of sound": the mereotopology of sound (second part [section 3]) and the instrumental logic of sound (third part [section 4]).

§1. Underspecification of space. This section addresses the problem of conceptual underspecification of "space" as a philosophical concept. It first distinguishes the problems of space concerning sound: the problem of sound location; the problem of the spatial structure of sound; and the problem of the spatial content of auditory experience. Afterwards, it presents the relationist and substantivalist theories of space and investigates whether that is related to sound. Substantivalist or absolutist theories of space, initially represented by Newton, hold that space is a substantial entity; whereas relationist or relativist ones, initially represented by Leibniz, hold that space is not an entity but a relationship between points or locations.[99] It is also noticed that this debate resembles greatly to that of orientation theories,[100] which has a relation to the spatial characterisation of sound.[101]

[99] Reichenbach, H. The Philosophy of Space and Time. New York: Dover, 1957; Sklar, L. Space, Time and Spacetime. California: University of California, 1974; Horwigh, P. On the Existence of Time, Space, and Space-Time// Nous, Vol 12, No. 4, P. 397-419; Friedman, M. Foundations of Space-time Theories, Relativistic Physics and Philosophy of Science. Princeton: Princeton University Press, 1983; Field, Hartry, Can We Dispense with Space-Time?// Proceedings of the Biennial Meeting of the Philosophy of Science Association, 1984, P. 333-90; Earman, J. World Enough and Space-Time, Absolute versus Relational Theories of Space and Time. Massachusetts: MIT Press, 1989; Ray, C. Time, Space and Philosophy. London: Routledge; Rynasiewicz, R. Absolute versus Relational Space-Time: An Outdated Debate?// The Journal of Philosophy, 1996, Vol. 96, No. 6, P. 279-306

[100] Dokic, J. Perception and Space// Matthen, M. (Ed.). Oxford Handbook of Philosophy of Perception. Oxford: Oxford University Press, 2015, P. 442-459

[101] Casati, R. Dokic, J. La philosophie du son. Nîmes: Editions Jacqueline Chambon, 1994.

§1.2 Sound topology, again. This section describes the known topological taxonomy bearing in mind two new aspects: the division between metaphysical (i.e. concerning the location of sound) and phenomenological claims (concerning where sounds are perceived to be), on the one hand;[102] and, on the other, its formalisation as an affair for dynamic epistemology.

§2.1 Scepticism on sounds' spatiality, first part: P. F. Strawson. This chapter analyses the impact and interpretations of the famous thought experiment of a "No-Space" or "Purely Acoustic World" by Peter Frederik Strawson.[103] Against a majority of interpretations,[104] it considers that Strawson should not be regarded as a defender of a scepticism in the case of sounds' spatiality. The critical reconstruction of Strawson's analysis takes into account the thought experiment, its relationship with Strawson's project of a descriptive metaphysics and, at a broader level, its connections with Kant's philosophy. The consideration of Kant's argument stresses the Kantian Thesis, according to which space is a necessary condition for objective experience. As some critics notice, the Kantian thesis is not really validated.[105] An important aspect when assessing Strawson's experiment, is that many critics think that Strawson claims that all sounds lack spatial structure. However, some think this is a matter of adjusting the quantification. This is the case of Santarcangelo and Terrone, who think that the experiment can be successful only if some sounds can be represented as lacking spatial characteristics. In any case, the diversity of interpretations is probably due to

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[102] The distinction is made by Casati, R., Dokic, J. Varieties of Spatial Hearing// Nudds, M. O'Callaghan, C. (eds.) Sounds and Perception, New Philosophical Essays, Oxford: Oxford University Press, 2009, P. 97-110

[103] Strawson, P.F. Individuals, An Essay In Descriptive Metaphysics// London, Methuen, 1959.

[104] Evans, G. Collected Papers// Oxford: Oxford University Press, 1985; Glouberman, M. Space and Analogy// Mind, 1975, Vol. 84, No. 335, P. 355-373; Bergman, G. Strawson's Ontology // The Journal of Philosophy, 1960, Vol. 57, No. 19 P. 601-622; Ihde, D. Listening and Voice, Phenomenologies of Sound // New York: State University of New York Press, 2007; Nudds, M. Experiencing the Production of Sounds// European Journal of Philosophy, 2001, Vol. 9, No. 2 P. 210-219// O'Callaghan, C. Perceiving the Locations of Sounds// Review of Philosophy and Psychology, 2010, Vol. 1, No.1, P. 123-140; Santarcangelo, V., Terrone, E. Sounds and Other Denizens of Time // The Monist, 2015, Vol. 98, No. 2, P. 168-180

[105] Casati, R. Dokic, J. La philosophie du son. Nîmes: Editions Jacqueline Chambon

the fact that Strawson was only interested in sound as for providing an example, and not in a casuistic sense.

§2.2 Scepticism on sounds' spatiality, second part: Brian O'Shaughnessy. As with Strawson, this section deals with the position of Brian O'Shaughnessy[106] concerning his querying of the spatial features of sound, and his critics. On O'Shaughnessy's view, locality does not figure as a necessary feature of sound, as it happens to be the case with loudness or timbre. He actually argues in favour of a conception of directionality rather than locality, that is, we do not hear sounds to be somewhere, but coming from somewhere. This section also considers later developments in O'Shaughnessy's philosophy, in particular concerning the problem of perceiving location and mobility and his arguments in favour of sound dynamism.

§2.3 Scepticism on sounds' spatiality, third part: Matthew Nudds. The final author to be considered concerning sound's spatial scepticism is Matthew Nudds. This section addresses those arguments and its objections.[107] In analysing Nudds's ideas on the subject, one can deduce several claims like that of the spatial mereological restriction of sound (i.e. sounds do not have spatial parts), spatially restricted individuation (i.e. sounds are not spatially individuated), and the idea of sounds as patterns of frequency or abstract individuals. We pay special attention to the critic that O'Callaghan has of Nudds's presentation, as he argues for sound's stable location and the possibility of perceiving it (that is, hearing it).[108]

§2.4 Conclusion. In this section it is concluded that neither Strawson, O'Shaughnessy nor Nudds can be considered as advocates of sound's spatial scepticism. It is argued

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[106] O'Shaughnessy, B. The Location of Sound//Mind, 1957, Vol. 55, No. 264 P. 471-490; O'Shaughnessy, B. Consciousness and the World// Oxford: Oxford University Press, 2000; O'Shaughnessy, B. The location of perceived sound// Nudds, M. O'Callaghan, C. Sounds and Perception, New Philosophical Essays, Oxford: Oxford University Press, 2009 P. 111- 125

[107] Nudds, M. Sounds and Space// Nudds, M. O'Callaghan, C. Sounds and Perception, New Philosophical Essays, Oxford: Oxford University Press, 2009 P. 69-96; Nudds, M. What are Auditory Objects, Review of Philosophy and Psychology, Vol. 1, No. 1, 2010, P. 105-122

[108] O'Callaghan, C. O'Callaghan, C. Perceiving the Locations of Sounds// Review of Philosophy and Psychology, 2010, Vol. 1, No. 1, P. 123-140

that they can be rather identified as holding a fallibilist position. Scepticism on sound's spatiality would imply some of the following claims: sounds are not located anywhere (blunt aspatialism); unknown and unknowable locations (we cannot learn the location of sound); spatially restricted structure (sounds do not have a spatial structure). It is argued that these authors could be rather identified with a fallibilist position, whose claim is that "some of our beliefs –and maybe even the majority of them— about the spatial structure of sound and its location are false".

§3. The logical representation of sound. This section distinguishes the two ways of addressing the logical representation of sound: the casuistic approach, that is that of the logical and spatial representation *of* sound; and the instrumental, that is the representation of logical relations sound; and the instrumental, that is the representation of logical relations *by the means* of sound.

§3.1. The casuistic approach: An optimistic mereology of sound. This section addresses a first way of formal representation of sound: mereology. In contrast with Chapter 3 (section §5), it argues that a mereological approach to sound is possible. Several types of mereological approaches to sound are considered. First the *folk mereology* of sound, then downgraded mereology (that is, a mereology of dots and lines), the mereology of experiences, and Brentano's idea of distinctional parts.[109]

§3.2 A (formal) topology of sound. This section completes the formal project by examining the formal aspects of sound's occupation of space. It addresses the topological concepts of region, location and occupation and their formal expressions in topology.[110] It revises several options in which one could say that sound occupy a

[109] For instance: Chuard, P. Temporal Experiences and Their Parts// Philosopher's Imprint, Vol. 11, No. 11), P. 1- 28; Green, E.J. A Theory of Perceptual Objects//Philosophy and Phenomenological Research, 2019, Vol. 99, No. 3, P. 663-693; O'Callaghan, C. Objects for Multisensory Perception, Philosophical Studies, 2016, Vol. 173, No. 5, P. 1269-1289; Skrzypulec, B. The nonclassical mereology of olfactory experiences// Synthese, Vol. 198, No. 1, P. 867-886; Brentano, F. Descriptive Psychology. London: Routledge, 1995.

[110] Casati, R., Varzi, A. The Structure of Spatial Localization// Philosophical Studies, Vol. 82, No. 2, 1996, P. 205-239; Casati, R., Varzi, A. Parts and Places: The Structures of Spatial Representation. London: MIT

region. In doing so, it formulates the principles of scattered location for sound, and that of no-interference events' location.

§4. The instrumental approach. In this section, the candidates for an instrumental approach are reviewed. Since many of the candidates for such an approach are encountered within the discussion of the philosophy of music, a first consideration concerning music as a part of the realm of sound is made. Afterwards, a first consideration concerning the diagrammatic approach to sound *à la* C. S. Peirce from the point of view of Ahti Pietarinen is analysed, this implies a project where the logical connectives and atomic propositions are made by acoustic means, the acoustic connectives are addressed together with its graphic counterparts. The second consideration is that of Max Ingolf's logic of harmony, where harmonic modulations can be used as depicting rules of logical inference. Thirdly, we consider Randall Dipert's and Roy Whelden's proposal of set-theoretical musical analysis. Then we consider Susanna Langer's proposal of Boolean Algebra for depicting intervals (pitch relations between two tones). Finally, an authored proposal is made in the case of *acoustic mereotopology*.[111]

§5. Conclusion: from physical space to logical space. This section unites the debates of the chapter —physical space vs. quality and logical spaces; relationism vs substantivalism; particulars and properties— with the idea of the *engine picture*. The

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Press, 1999; Parsons, J. Theories of Location// Zimmerman, D. (Ed.). Oxford Xtudies in Metaphysics, Vol. 3. Oxford: Oxford University Press, 2007, P. 201-232; Gilmore, C. Location and Mereology// Zalta, E. (Ed.). The Stanford Encyclopedia of Philosophy, 2018, https://plato.stanford.edu/archives/fall2018/entries/location-mereology/.

[111] Langer, S. A Set of Postulates for the Logical Structure of Music// The Monist, 1929, Vol. 39, No. 4, P. 561-570; Dipert, R, Whelden, R. Set-Theoretical Music Analysis, The Journal of Aesthetics and Art Criticism, 1976, Vol. 35, No.1, P. 15-22; Dipert, R, Whelden, R. Set-Theoretical Music Analysis II// Indiana Theory Review, 1978, Vol. 1, No. 2, P. 50-60; Forte, A. The Structure of Atonal Music,//New Haven: Yale University Press, 1973; Pietarinen, A. "Is non-visual diagrammatic logic possible?// Pombo, A. Gerner, O. Studies in Diagrammatology and Diagram Praxis, College Publications, London, 2010, P. 73–81; Champagne, M. Sound Reasoning (Literally): Prospects and Challenges of Current Acoustic Logics// Logica Universalis, 2015, Vol. 9, No, 3, P. 331-343; Ingolf, M. A Molecular Logic of Chords and their Internal Harmony// Logica Universalis, Vol. 12, No. 1-2, P. 239-269

first step is to explicate the idea of logical and quality space of sound.[112] The idea amounts to a mechanism that allows properties, which are located in a relational space (the quality space), to manifest or instantiate in the physical space. This also explains the dynamic between properties and particulars.

Chapter 5, The Problem of Perception in the Philosophy of Sounds and Auditory Experience

This chapter pursues several interconnected objectives. The general one is that of bridging philosophy of sound with philosophy of perception, mainly when it comes to the discussions of object and content of perception, whose distinction is not really stated in the literature on sounds. The other upshot is to pave the way down for an epistemology of auditory experience

§1. The Scientific Picture II: The auditory system. This section is dedicated to the question of how we hear, and, thus, continue the scientific picture we started in the introduction. At that moment, the presentation of sound in its physical fashion was addressed, relative to wave-pressure mechanisms and behaviours. Here we continue with the part concerning our auditory apparatus, which encompasses physiological and cognitive aspects. There can be a philosophical, and even a metaphysical reading of this picture. In particular, by observing the functions of our auditory apparatus we may also favour some views, for instance PV1.The exposition covers the concept of grouping, as a key element of auditory scene analysis[113]; and then the outer, middle and inner ear with a special attention to the functioning of the cochlea and auditory transduction.

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[112] Turner, J. The Facts in Logical Space, A Tractarian Ontology. Oxford: Oxford University Press, 2016; Rayo, A. The Construction of Logical Space. Oxford: Oxford University Press; Renero, A. Consciousness and Mental Qualities for Auditory Perception// Journal of Consciousness Studies. Vol. 21, No. 9-10, P. 179-204; Zenker, F. Gärdenfors, P. Introduction// Zenker, F. Gärdenfors, P. (eds.). Applications of Conceptual Spaces, The Case for Geometric Knowledge Representation. London, Springer, 2015.

[113] Bregman, A. Auditory Scene Analysis. Massachusetts: MIT Press, 1990; Nudds, M. What Are Auditory Objects// Review of Philosophy and Psychology. 2010, Vol. 1, No. 1 P. 105-122

§2. Objects and contents of auditory perception. A key distinction is addressed in this section, that concerning object and content of perception. Objects of perception are considered in terms of the direct/indirect debate. Contents of perception, in addition to their intricate definition, are addressed in terms of the distinction conceptual/non-conceptual.[114] It is argued that in the literature on sound the terms are unfortunately confused, and that no distinction is made in this sense. The contents of audition are contrasted with propositional contents like those of belief and knowledge.

§2.1 Audible features: loudness, pitch, and timbre. Audible features are among the first candidates to be considered as contents of auditory perception,[115] this section describes those features and the arguments concerning their direct perception and its interesting features both for metaphysics and philosophy of perception.[116] It pays special attention in distinguishing these audible features from its physical correlates: frequency for the case of pitch; amplitude for the case of loudness; and the combination of spectral envelope and timbre. All audible features proper (excluding duration and location) are the result of an interaction of different physical features, not only a one-one corelation. This section also discusses whether one can hears the

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[114] Nanay, B. Perceptual Phenomenology// Philosophical Perspectives, 2012, Vol. 26, No.1, P. 235- 246; Nanay, B. Perceptual Representation/ Perceptual Content// Matthen, M. (ed.) Oxford Handbook of Philosophy of Perception. Oxford: Oxford University Press, 2015, P. 154-164; Peacocke, C. Sense and Content// Oxford: Oxford University Press; Peacocke, C. Perceptual Content// Almog, J., Perry, J. Wettstein, H. (eds.), Themes From Kaplan. Oxford: Oxford University Press, 1989; Siegel, S. Which Properties are Represented in Perception?// Gendler, T. Hawthorne, J. Perceptual Experience, Oxford: Oxford University Press, 2006 P. 481-503; Siegel, S. How can we discover the contents of experience?// Southern Journal of Philosophy, 2007, Vol. 45, S. 1, P. 127-142; Siegel, S. The Contents of Visual Experience. New York: Oxford University Press, 2010; Siegel, S. The Contents of Perception// Zalta, E. (ed.), The Stanford Encyclopedia of Philosophy, 2016, URL: https://plato.stanford.edu/archives/win2016/entries/perception-contents/ ;Wright, W. Non-conceptual Content// Matthen, M. (ed.). The Oxford Handbook of Philosophy of Perception. Oxford: Oxford University Press, 2015 P. 182-198

[115] O'Callaghan, C. Auditory Perception// Zalta, E. (ed.), The Stanford Encyclopedia of Philosophy, 2016, URL: https://plato.stanford.edu/archives/sum2 020/entries/perception-auditory/

[116] Deutsch, D. Grouping Mechanisms in Music// Deutsch, D. (ed.) *The Psychology of Music*. Amsterdam: Elsevier, 2013 P. 183-248; Di Bona, E. Some Considerations on Pitch// Phenomenology and Mind, 2013, Vol. 4 P. 244-54; Heller, E. Why You Hear What You Hear, an Experimental Approach to Sound, Music, and Psychoacoustics. New Jersey: Princeton University Press, 2013; Nussbaum, C. Musical Perception// Matthen, M. The Oxford Handbook of Philosophy of Perception. Oxford: Oxford University Press, 2015 P. 496- 515; Oxenham, The Perception of Musical Tones// Deutsch, D. (ed.) *The Psychology of Music*. Amsterdam: Elsevier, 2013 P. 1-33

features without hearing sounds and it evaluates once again Leddington's claim that hearing sounds is hearing the audible features.

§2.2 Silence. This section is concerned with silence as a possible object of auditory experience and not just the mere absence of sound. The discussion on silence, which is a branch within the philosophy of sound, is analysed.[117] Concretely, it discusses the cognitive and non-cognitive view on silence. For the cognitive approach, there is no such a thing as hearing silence; whereas for the non-cognitive approach, which is Sorensen's famous viewpoint, silence is a direct object of perception. This section further argues that silence is not a scientific concept, and that the non-cognitive approach confuses silence with "quietness".

§2.3 Echoes. This section reviews the discussion on echoes, on whether they are separated objects of audition, or just a part of the primary sound. This entails considering issues of direct perception and the metaphysical repetition of entities.[118] The debate around O'Callaghan's account of "Primary Sound Account of Echoes" is critically revised.

§2.4 Locations and spaces. In this section, two candidates for objects of auditory perception are analysed: locations and space. The framing of locations follows and criticises an argument made by Casey O'Callaghan and his discussion with Matthew Nudds, Peter F. Strawson and Brian O'Shaughnessy.[119] The possibility of hearing spaces follows an argument made by Nick Young, who discusses Mathew Nudd's claim

[117] In particular the works of: Sorensen, R. Hearing Silence: The Perception and Introspection of Absences// Nudds, M. O'Callaghan, C. Sounds and Perception: New Philosophical Essays. Oxford: Oxford University Press, 2009 P. 126-145; Phillips, I. Hearing and Hallucinating Silence// Macpherson, F., Platchias, D. (eds.) Hallucination, Philosophy and Psychology. Cambridge: MIT Press P. 333-360; Meadows, P. Experiencing Silence, Canadian Journal of Philosophy, Vol. 59, No. 2, P. 238-250

[118] O'Callaghan, C. Echoes// The Monist, 2007, Vol. 90, No. 3 P. 403- 414; Fowler, G. Against the Primary Sound Account of Echoes// Analysis, Vol. 73, No. 3 P. 466-473

[119] O'Callaghan, C. Perceiving the Locations of Sounds// Review of Philosophy and Psychology, 2010, Vol. 1, No. 1, P. 123-140; Nudds, M. What Are Auditory Objects// Review of Philosophy and Psychology. 2010, Vol. 1, No. 1 P. 105-122; Strawson, P. Individuals. An Essay In Descriptive Metaphysics// London: Methuen, 1949; O'Shaughnessy, B. Consciousness and the World. Oxford: Oxford University Press 2000

that we cannot "hear spaces".[120] A formal consideration on what does it entail to perceive "locations" is sketched.

§2.5 Music. An observation of music, as something heard through sound, is made in this section. It revises the discussion around conceptual and nonconceptual content of music, and whether music is directly or indirectly perceived.[121] This section pays particular attention to some debates on music perception, in particular the arguments that Jason Leddington presents against Peter Kivy and Ruger Scruton. Leddington argues in favour of a side notion of musical content in auditory experience, unlike Scruton's "zero content" policy, or Kivy's "only-sound content policy".

§2.6 Meanings. Meanings and speech are among the candidates for objects of audition. This section analyses whereas contents with "high order" properties, such as meanings, can figure within our audition.[122] This section considers O'Callaghan's arguments against the idea that we can perceive "high order properties" such as meanings. It also addresses whether the restriction goes for all "high order properties" or only to some, that is, whether our auditory perception as "rich" or "thin" content.

§2. 7 Gendered voices. In continuing the review of "high order" properties of content,[123] Elvira Di Bona has suggested that the gender of voices (male, female or androgynous for example) can be considered among the contents of audition.[124] In

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[120] Young, N. Hearing Spaces// Australasian Journal of Philosophy, 2017, Vol. 95, No. 2, P. 242-255

[121] Scruton, R. Sounds as Secondary Objects and Pure Events// Nudds, M., O'Callaghan, C. Sounds and Perception: New Philosophical Essays. Oxford: Oxford University Press, P. 50-68; Scruton, R. Hearing Sounds// Zimmerman, D. (ed.), Oxford Studies in Metaphysics, Vol. 5, Oxford: Oxford University Press, 2010, pp. 271-278; Leddington, J. Sonic Pictures// Journal of Aesthetics and Art Criticism, forthcoming.

[122] Mole, C. The Motor Theory of Speech Perception// Nudds, M. O'Callaghan, C. Sounds and Perception: New Philosophical Essays. Oxford: Oxford University Press, 2009 P. 211-233; O'Callaghan, C. Speech Perception"// Matthen, M. (ed.). The Oxford Handbook of the Philosophy of Perception. Oxford: Oxford University Press, P. 476-495; O'Callaghan, C. Beyond vision, Philosophical Essays// Oxford: Oxford University Press, 2017.

[123] Siegel, S. The Contents of Visual Experience// Oxford: Oxford University Press, 2010

[124] Di Bona, E. Towards a rich view of auditory experience// Philosophical Studies, 2019, Vol. 174, No. 11 P. 2629-2643

this section, it is stressed that once that timbre has been admitted as a "high order" property, the inclusion of this new content probably does not amount to a different *type* of content.

§3. Illusions, hallucinations and inaccuracies in auditory perception. This section explores the cases of non-veridical auditory experiences,[125] in order to see whether that consideration can advance some of the available views in the literature. It presents cases of *Tinnitus*,[126] Diana Deutsch's scale illusion,[127] the McGurk Effect,[128] and the case of cochlear implants.[129] It is argued that PV1 theories usually deal better with some of this puzzles in virtue of the explanations being based on sensations. In the case of the McGurk effect, the emphasis is rather made on the aspect of cross-modal perception, that is, the way in which different sense-modalities cooperate in order to interpret the information brought by the perceptual inputs.

§4. Towards an epistemology of auditory perception. This section is concerned with sketching out the epistemological project for auditory perception. In order to do that, it considers cases that put veridicality into question. These counterexamples encompass: Gettier-like cases, the Error Theory of Perception problem, and issues concerning uniformity[130] but applied to sound.

§4.1 What Yekaterina didn't know. Tantamount to Frank Jackson's article "What Mary Didn't Know", [131] this section offers an addendum to the epistemological

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[125] Crane, T., French, C. The Problem of Perception// The Stanford Encyclopedia of Philosophy. Zalta, E. (ed.), URL: https://plato.stanford.edu/archives/spr20_17/entries/perception-problem/; Snowdon, P. How to interpret 'direct perception'// Crane, T. The contents of Experience, Essays on Perception. Cambridge: Cambridge University Press, 1992 P. 48-78

[126] Tate-Malby, M. Principles of Hearing Aid and Audiology. London: Whurr Publishers 1994

[127] Deutsch, D. An auditory illusion// Nature, 1974, Vol. 251, P. 307-309; Deutsch, D. Musical Illusions// Scientific American, 1974, Vol. 233, No. 4, P. 92-104

[128] McGurk, H., McDonald, J. Hearing Lips and Seeing Voices// Nature, 1976, Vol. 23, No. 30, P. 746-747

[129] Bess, F., Humes, L. Audiology: The Fundamentals. New York: Lippincott Williams & Wilkins

[130] Sainsbury, R. A puzzle about how things look// McCabe, M., Textor, M. Perspectives in Perception. Frankfurt: Ontos Verlag, 2007.

[131] Jackson, F. What Mary Didn't Know// The Journal of Philosophy, 1985, Vol. 83, No. 5, P. 291-295

considerations, a "knowledge argument"[132] scenario is made for the case of sound. Furthermore, it also analyses other links between auditory perception and epistemology. In particular, the differences across sense-modalities (especially contrasting vision and audition), and it gives a formal account of such differences.

Conclusions. The results of the investigation are revised with a specific emphasis on the gains of endorsing a syncretic view on sound. In this sense, it gives a definition of sound according to the syncretic approach. It stresses how this view avoids the main problems the other views face, such as conceptual underspecification, ontological reduction and spatial segmentation. It also considers, by abiding by the falsifiability desideratum, what could be the falsifiers of this new theory.

Author's publications on the topic of the thesis study

The works published by the author in journals indexed in the international databases of indexing and citation, as well as on the list of high-level journals of the HSE:

1. Méndez-Martínez, Jorge Luis. What Counts as "a" Sound and How "to Count" a Sound. The Problems of Individuating and Identifying Sounds// Synthesis Philosophica, 2019, № 76 (1), pp. 173-190, doi: https://doi.org/10.21464/sp34112.
2. Méndez-Martínez, Jorge Luis. Ontology of Sound and the Husserl-Brentano Analysis of the Inner Consciousness of Time // Horizon. Studies in Phenomenology, Феноменологические исследования, 2020. № 9 (1). pp. 184-215; doi: https://doi.org/10.21638/2226-5260-2020-9-1-184-215.

[132] Jackson argument was labelled as such, it is aimed at questioning physicalism in the mind-body problem discussion.

3. Méndez-Martínez, Jorge Luis. If Sounds Were Dispositions: a Framework Proposal for an Undeveloped Theory // Organon F. 2020. № 27 (4). pp. 446-479; doi: https://doi.org/10.31577/orgf.2020.27403.