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What Counts as "a" Sound and How "to Count" a Sound

The Problems of Individuating and Identifying Sounds

Abstract

This paper addresses the problem of sound individuation *(SI) and its connection to* sound ontology *(SO). It is argued that the problems of SI, such as aspatiality, extreme individuation, indexical perplexity and duration puzzles are due to SO's uncertainties. Besides, I describe the views in SO, including the* wave view *(WV), the* property view *(PV), and the* event view *(EV), as Cassey O'Callaghan defends it. According to O'Callaghan, EV offers clear standards to individuate sounds. However, this claim is countered by the consideration that any view could also defend the standards in SO, and thus, EV does not solve any of the problems mentioned above. As a way of showing the difficulties inherited by sound's inner ontology, the problem of its linguistic representation is also addressed. The problem of SI can be developed within the frame of the philosophy of language and, specifically, regarding the discussion about mass vs count-sortal terms. Is the term sound a mass or a count-sortal? It is shown that, for reasons pertaining SO, the decision regarding the case of sound as a mass or count-sortal term remains open. SI is, thus, covered from the SO to the philosophy of language.*

Keywords

sound, individuation, identification, acoustics, ontology of sound, event, mass terms, count-sortal terms

In one of the most important books to date about the philosophical discussion regarding sounds, *Sounds, a philosophical theory*, Cassey O'Callaghan states that disputes about individuating sounds (or events in general, since he claims sounds are events) are "infamously difficult to resolve" (O'Callaghan 2007, 64).[1] In this paper, I want to explore the reasons for this difficulty and, by doing so, address the problem of sound individuation (SI) in its connection to Sound Ontology (SO).[2]

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Another way of addressing what, allegedly, belongs to the most relevant philosophical order is Sound topology, which is mainly elaborated by Roberto Casati and Jérôme Dokic (1994). The difference is that, whereas SO

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The purpose of this paper is to describe some of the problems concerning SI not only in their manifestation but also in the way they are represented. This will lead me to argue that many of these problems are connected with the uncertainty pertaining SO.

SO belongs to the philosophy of sounds and auditory experiences. This endeavour is inscribed within the more general field of the philosophy of senses, and the commonalities with the philosophy of colour are not only noticed but also employed by many philosophers (for instance Kulvicki 2008). However, continuous appeal to colour is also problematic if one wishes to address the philosophy of sounds on its own and not merely as an appendix of the philosophy of colour. In this spirit, Cassey O'Callaghan (2007) has written about "the tyranny of the visual", and even other authors beyond the scope of analytic philosophy have tried to find a different path than that of 'visualism' (Ihde 2007). Visualism is tempting when we try to address individuation of particulars (if sounds even are such, as I will explain later), but it is a temptation that we must resist if we are to find a different way for SI to contribute to the philosophy of the senses in a manner more important than being a corollary or parallel of the philosophy of colour.

In this declaration of theoretical independence, the growing field of the philosophy of sounds stills lacks systematisation in the way the debate has unfolded, its theoretical choices, the weight of their objections, the style of argumentation, and so on. This paper belongs to a global effort in trying to model the field by concerning with its main issues. Sound individuation is precisely one of the tokens that, in the long run, can allow us to have a clearer picture of the philosophy of sounds in general, and SO in particular.

A way in which this philosophical discussion has developed is through debate among the available positions, thus, displaying it as a matter of theoretical choice – but this was done without any Kuhnian general considerations, not to mention metaphysical reflections. The famous *argument from the vacuum* is one of them, puzzles that perform defending a theory while attacking another,[3] and aspects that still warrant an explanation. SI is one of them.

SI has been addressed already in the philosophical discussion on sounds. One of those approaches is O'Callaghan's, which I will review in §3. Another one is that of Nudds (2010) while depicting the process of auditory *grouping*, which refers to the perceptive process through which the auditory system groups a series of patterns and/or sounds that form an auditory object. The emphasis Nudds makes on the relationship between perception and sources covers some aspects of SI but leaves uncovered some strictly ontological considerations that, while neglected, might impact on the uncertainty of the concept of 'object' itself (Meadows 2018, 301).

To address these thus far neglected or untouched aspects, my target-questions are these:

1. Why is the subject of sound individuation often overlooked or avoided?
2. Is there a mismatch between SO and SI? If so, why?
2. How does SO affect the linguistic representation of sound?

To answer these questions, I first describe concrete problems for sound individuation concerning the manifestation of sound. In a second section, I offer an account of the views in SO following O'Callaghan's integral view. When I mention SO, I refer to the philosophical discussion concerning the nature of sounds. In the third section, I will review O'Callaghan's attempt to sketch out

criteria for SI in an assumed association with the view in SO which he, among others, defends: the Event View (EV), according to which sounds are events. The fourth section addresses the problem of the representation of sound from the perspective of the philosophy of language. In linguistic accounts, the subordinated question is whether "sound" is a mass or a count-sortal term. This covers SI from the angle of linguistic representation, an issue that, to my knowledge, philosophy of sound has not contributed to so far.

1. Problems of Sound Individuation

First things first, what do we mean by the problem of "sound individuation"? In a way, this would be a *token* of the general and more relevant discussion on *individuation*. By individuation, I mean what makes a particular to be the particular that it is, different from other particulars (Davis 2005, 292).

The problem of individuation covers that of identification, or more precisely, the identification of a particular. However, it is not strictly necessary to cover identification to address individuation, as there can be unidentified individuals; of course, under the premise that there is an objective world independent from a perceiving mind. The fact that identification is not necessarily individuation is noticeable in the *identification* of an object through identifying a contingent property of that object, but that property *does not make it what it is*. This is an important aspect because individuation as a principle thematically separated from identification can turn into a rather abstract discussion.[4] In our case, even though we endorse sound objectivity and publicity while discussing SI, we also entail identification. In this sense, if the issues for identification remain problematic, they would also be so for individuation in an abstract sense; but if they were solved or solvable, this would not entail that they are automatically solvable for individuation in an abstract sense.

Being an abstract discussion about individuation does not prevent us from bearing in mind some of the most metaphysical aspects from the philosophical discussion about individuation. Apart from being cautious of not stating that "identification = individuation", another aspect noticed by Héctor-Neri Castaneda (1975, 132) is that individuation is different from distinctness or diversity. Often, when someone attempts to illustrate the problem of individuation we are given the following expression (as it was just done some few lines ago): the thing that makes an object to be that object *as different from other objects*. This is, of course, a consequence of individuation, and it is a resource at hand serving to illustrate the problem. But even if an object is the only kind of object in the universe, without comparison, there still is an individuation problem.

On the line of what individuation *is not*, we should be cautious of taking it as a property, say, as *individuality*. This is so because, in very elaborated scenarios (like Putnam's twin earth), two objects can share the same properties or set of properties (Castaneda 1975, 135).

investigates what sounds *are*, sound topology inquires *where* sounds are, and by doing so they propose that this question is just as or even more important as SO's. Yet, I will not follow this path, for I think that each view in SO entails, at a certain extent, a position in Sound topology.

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A good example of this is a recent paper by Phillip J. Meadows, where he defends *medial theories* of sound, more specifically WV (see. §2), by means of the puzzle of infinite waves that, although counter-intuitive, proves that those theories face the challenge better that the *distal* ones.

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Like that of Scotus' principle of *haecceity*.

In addition, if we point to an *individuator*, that is, the thing that is making that object being that individual, Castaneda considers that this can be neither a property nor an individual: it is *an operator* (like the modal operators of necessity, possibility, and so on) (Castaneda 1975, 137). To assess Castaneda's conclusion is beyond the scope of this endeavour, but it is worth taking some of his observations into account.[5]

The individuation considered here, thus, is not taken in an abstract sense, it is of a particular, namely sound, and it entails identification. However, even in a narrow sense, problems arise.

1.1. Aspatiality

Sounds and space form such a difficult couple that one of the largest philosophical discussions about sounds is related to *where* sounds are, mainly because they seemingly lack inner spatial structure. Precisely this led Strawson (1959, 65) to make a separate consideration on the subject of sound because it did not seem to fit into his scheme of descriptive metaphysics, where the basic particulars where spatiotemporal bodies. In doing so, Strawson proposed a thought experiment envisioning a purely acoustic world, where, according to him, that was the *par excellence* model of a non-Space world. For the author of *Individuals*, ascription of direction or spatial properties to sound is due to (as we would say nowadays) its multimodal making, yet he declares:

> "A purely auditory concept of space is an impossibility." (Strawson 1959, 66)

Strawson's approach has raised a significant discussion, and by it, the philosophy of sounds was revived as a theoretical debate. It is probably because of these concerns that we have a debate where the question is not *what*, but *where* sounds are (Casati & Dokic 2014). And, while inquiring sounds' location or locatedness (O'Callaghan, *dixit*), a radicalisation of Strawson's puzzle leads to the position known as "aspatial theories" (ibid.).

This suggestion about the lack of inner spatial structure of sounds has, naturally, been contested. Beyond the scope of analytic philosophy, Don Ihde (2007, 32) thinks that a "purely auditory space" is a theoretical impossibility, since auditory experience would always be embodied and, thus, the mere idea of a-spatiality would be false. Critical towards this idea but within our analytic borders, Nudds (2010) argues that we experience the *sources* of sound as having spatial content, and not the sounds themselves. This is a certainty since, despite this inner lack of spatiality (if granted), a sound provides us with information about space (O'Callaghan 2014).

It is interesting to notice that some notions applied to the individuation of particulars that are material bodies are just translated when dealing with temporal objects, especially when we talk about sounds. For example, durations are the equivalence of distance in a bidimensional sense, and so are other notions, for example, when we discuss the pitch or intervals in music theory.

Therefore, even though sounds are aspatial, or not entirely spatial, they seem to be in constant relation with spatiality and, thus, aspatiality complicates not only individuation but also sound identification.

1.2. Sound Complexity

SO faces another problem, that of sound complexity. Most authors, musicians, cognitive scientists, psycho-acousticians and specialists consider the

possibility of complex sounds. The notion of a 'complex sound' refers, for example, to the interaction of several sounds in accord, or the instant of a coordinated orchestra or music band. This kind of sounds are said to be complex because many sounds compose them.[6] In music, this complexity can be expressed in the form of polyphony, where several melodic lines interact with each other. However, for it to be a melody, we are already referring to a plurality of sounds over time, so it can be said that polyphony, as well as some other effects of musical texture, are a product of sound complexity.

Interaction of sounds, nonetheless, may not be the only form of sound complexity. We could also consider the complexity of sound properties or audible qualities, e. g. those known to human ear: pitch, intensity and timbre. For example, in music notation, we have *glissando*, where continuous sound changes from one pitch to another. In cases where there is a pitch transformation without discontinuity, we can refer to *pitch complexity*. Accordingly, we could talk about *volume complexity*, whenever we have a sound described as *in crescendo* or *decrescendo* in intensity or volume. It is difficult to conceive *timbre complexity*, but theoretically, we could think of a change of timbre from T1 to T2.

These complexities refer to temporal changes in duration, but there could also be interactions of different pitches, intensities or timbres displayed simultaneously. If so, we could distinguish between simultaneous pitch complexities and changing pitch complexities, as well as simultaneous volume complexities and changing volume complexities. With timbre, we probably have the only option of changing timbre complexity, because otherwise, we would have a roughly defined poly-acoustic complexity.

The problem of individuating sounds beyond the criterion of duration can be proved to be "infamously difficult" (O'Callaghan, *dixit*). To face this difficulty, I would experiment with an individuation criterion we can call 'basic sound'. A basic sound is, intuitively, on the opposite side of a complex sound. This could seem trivial, but if we think in degrees of complexity as a spectrum, the basic sound is at the bottom of such a spectrum. In this sense, the definition of a basic sound is the following: basic sound does not present any change in its qualities in terms of duration, and it only has a causal source.

Maybe the causal source is in itself complex: it could involve as many mechanisms as a musical instrument or even an electronic music player of any kind. However, this may encompass all kinds of sources, from simple to complex, as long as it is one.

It is clear that in the case of the basic sound we do not have problems with its individuation, but as the complexity increases, we could fairly ask about are we dealing with "one sound" or more.

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The view Castaneda proposes is rather formal. After ruling out some standard views on individuation, he concludes that, being the individuator an operator, we have two kinds of individuals: abstract individuals, that are sets of entities, whose individuator is the set; and concrete individuals formed by abstract individuals, whose members are monadic properties (Castaneda 1975: 139).

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A sceptic inquisition, like the one conducted by Peter Unger in "The problem of the Many", is feasible. In his seminal paper, Unger (1980) uses the notion of the unity of a cloud, which from a point of view clearly looks like *a cloud*, consisting of many raindrops, and is not perceived as particulars when they are *in the cloud*. Also, at a certain height, you don't perceive *a single cloud*. Thus, mereologically the unity of something is always debatable. Of course, this is a textbook example for vagueness. But Unger goes beyond in order to question the very pertinence of ordinary objects. I think that this discussion is applicable to complex sounds to a certain extent.

1.3. Indexical perplexity

Let's illustrate with an example. Olya is driving, and Ben is sitting in the co-pilot seat. Sasha is in the back of the car as they talk about different things but, specifically, they are talking about the landscape. They are also listening to some music. Sasha is also paying special attention to the landscape and its varieties of plants. Suddenly, Olya exclaims "What is that?". Sasha is puzzled because he does not know what Olya means. Is it something in the landscape? Is it about some plant? Is it some animal? Something inside the car? Maybe the flying insect that just got inside the car? Ben is also puzzled, and he asks "Do you mean that *cactus* over there?" as he points out to a *cactus* on the road. Or do you mean "this", he points out at the sneaky insect. *Nota bene* that spatial proximity makes a difference between "that" and "this". But Olya was not talking about any of these objects. She specifies "No, I mean – this…" and she is pointing to the radio. At the time, they were listening to experimental contemporary music. Now, Ben and Sasha are pretty sure she does not mean the radio as an object.

By "this" she means a series of sounds. Probably "this" is not a specific sound in the melody they are listening to, but a complex sound in which many instruments intervene; a melody as a unity or a piece of it. The point here is that the word "this" suggests we could enlarge the discussion about indexicality in the style of Kaplan, Perry and others. Thus we reach another problem: that of *reidentification*.

1.4. Reidentification and Funesian Individuation

In one of his most famous short stories, "Funes, the Memorious" ("Funes, el memorioso"), Jorge Luis Borges (2000) describes the story of a man, Ireneo Funes, who, after suffering an accident in which he fell off a horse, was able to remember almost everything. The accident had led him to engage in projects such as naming the natural numbers or reconstructing a whole day by recalling every detail of it. But this marvellous power came with a disadvantage: he was unable to tell that the dog he saw at 3:15 and the dog he saw at 3:30 were *the same*. Funes was not able to make identity statements or to notice identity through time because he was absorbed by the extreme individuation of every object he perceived or remembered. Let us call this a *Funesian individuation*.

What happens with sounds? If sounds are events, such as the event of my first kiss, the battle of Stalingrad, my cat killing a mouse and the moment I decided to submit this paper, and each event has its own identity as *that* event, and it has been individuated as spatiotemporal affair, then we are just surrounded by all the microevents of every sound we hear and each has its own identity. If this were so, each sound would have a story of its own, just as particulars do: you, my cat, and the events I have just mentioned.

It seems that there is nothing wrong with this image in terms of consistency, except that it is an overpopulated ontology. In this fashion, events cease to exist rapidly. Thus, when Olya asks, in the last example, "What is this?", it is hard for me to find out what "this" is if "this" is not here nor there anymore. We have, then, a problem for reidentification associated with its indexicality and, more specifically, with sound reidentification. The problem of reidentification, as we might recall, has been noticed as having crucial importance for talking about particulars in Strawson's *Individuals*. And here the following issue arises: if we cannot reidentify a sound, can we talk about sounds?[7]

There are two answers on sight here: either sound's nature, as an (uncertain) ontological matter, prevents not only its proper reidentification but the singling out of it by means of language, or the problem lies in the structure of our linguistic frameworks. As I will argue in §4 and in §5, things get thornier as, ultimately, our linguistic frameworks are made through sound.

Going back to the issue of the question of whether each sound that has ever existed, is existing or will exist deserves our attention as it happens in relation to other particulars, could be contested in the sense that our existence can titled meaningless at a cosmic scale. But, gloomy thoughts aside, and going back to Funes, if, for instance, a guitarist pulls the sixth string twice, with silence between each time they play, are these *different sounds*? Or is it "the same sound" played twice?[8]

Thus, besides issues coming along with aspatiality, conflation (apparent or not) remains a problem between Funesian individuation and EV.

1.5. Duration puzzles

Duration seems to be the most solid foundation for the discussion about SI, and thus I conclude this section with the last remark on this subject. One of the reasons to doubt that sounds are properties of the perceiving mind is the publicity of sounds. Sounds must be public so that we can exclude auditory hallucinations such as *Tinnitus*. We can question what happens with individuation of sound in these cases:

a) An auditory subject *S* cognitively elaborates, from tiny and *quasi* continuous or adjacent, differentiated sounds a *single and individual* sound[9]. This can be due to the difficulty of perceiving the discontinuities or just lack of

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Jérôme Dokic (2007) identifies "two ontologies of sounds" when he considers these problems. Together with Casati, he is more interested in the topological approach than in the purely ontological. The ontological disjunction he points out is that between sounds as "unrepeatable events" or sounds as "repeatable objects". In the ontologies considered further on, I will endorse division marked by O'Callaghan, on whose adherence (to the event view as we will see later on) Casati and Dokic coincide.

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There is an account for this in Husserl's phenomenology. In the second investigation (§14) of the *Logische Untersuchungen*, Husserl discusses nominalism and the correspondence between an *ideal object* and a name, like that of the note C: "Beschränken wir uns der Einfachheit halber auf direkte Namen (Eigennamen in einem weiteren Sinne), so stehen einander gegenüber Namen der Art wie *Sokrates* oder *Athen* auf der einen Seite und Namen wie *Vier* (die Zahl Vier als einzelnes Glied der Anzahlenreihe), *c* (der Ton c als ein Glied der Tonleiter), *Rot* (als Name einer Farbe) auf der anderen Seite. Den Namen entsprechen gewisse Bedeutungen, und mittels ihrer Beziehen wir uns auf Gegenstände. Welches diese genannten Gegenstände sind, das kann, sollte man denken, gar nicht strittig sein. Es ist einmal der Person des Sokrates, die Stadt Athen oder sonst ein individueller Gegenstand; das andere Mal die Zahl Vier, die Tonstufe c, die Farbe Rot oder ein sonstiger ideeller Gegenstand." (Husserl 1984, 144–145) Thus, the note would be a Universal, such as red (or 'redness') and the note played is like the object *being* red, that is, they are particulars, just as my cats 'Crepa' and 'Toga' are occurrences – particulars – of "cat". Or, in an even briefer sense, we could say that the sounds played are *tokens* of a *type*, say, C, D, or whatever you like (of course, I think that *type-token* distinctions are, by the way, at a certain extent compatible with Universal-Particular distinctions).

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In computational auditory scene analysis, there is a discussion of this sort while addressing "continuity preserving signal processing" (Andringa 2011; Rosenthal, Okuno (eds.) 1998). In his modelling of a "single auditory object", Nudds (2010, 106) has similar concerns.

attention from *S*. A key point here is that those differentiated sounds are not *differentiable*, or at least not easily differentiable.

b) An auditory subject *S* who is constantly pressing/releasing her ear tragus, 'cuts' a sound which, publicly, is clearly *one sound*.

If we abide by the criterion of publicity it should not matter if *S* falls in either a) or b), because *there is a sound over there* that is *in itself individuated*. However, being sound so heavily connected to perception and even cognition, the fact that we stand by the criterion of the *majority* of people who listen in a particular way is one of the less compelling arguments to explain intersubjective variation, and it does not seem to be the best way of accounting for SI.

Besides perception and cognition, it could also be connected with the way we *refer to* sounds.

2. Sound Ontology

As previously stated, within SO we have different views on what sounds are. We can resume it in basically three positions, the first of whom has a double meaning.

1. Property View (PV): sounds are properties, they can be considered as properties of the perceiving minds (PV1) or of objects (this could be PV2).
2. Wave View (WV): sounds are acoustic waves. This is the predominant view for natural science and, in particular, acoustics.
3. Event View (EV): sounds are events (and thus particulars), that are spatio-temporally circumscribed, that occur at the place of the source (the vibrating or sounding object).

It is interesting to notice that there are disciplinary tendencies here. PV1, for instance, seems to be more prone to a purely psychological understanding of sounds, although it might be unfair to suggest that there aren't physicalist opinions in psychology. WV, on the other hand, is subordinated to science in general and physics in particular or, even more specifically, to acoustics. EV, finally, is rather a philosophical making in which sounds are particulars, not properties, but belonging to a specific type of particulars: events. I have already mentioned the particular features of EV through the case of *Funesian individuation*.

The problem is that none of these views explicitly covers sound individuation. There is, nonetheless, the presumption that EV covers standards that are clear enough for SI.

3. O'Callaghan's attempt to engage SO with SI

Revolving around the discussion of what can be considered *a sound*, O'Callaghan mentions the following aspects:

1. To have a duration.
2. To be capable of surviving changes to their properties across time.
3. To have stable distal locations.
4. To require a medium.
5. To occupy distinctive causal roles.

EV, particularly, is said to individuate sounds in terms of spatio-temporal boundaries and causal sources. Hence, temporal discontinuities mark different sounds, and different causal sources indicate different sounds. For example, if I play an instrument like the piano, it is not clear where the causal source is: is it the key when pressed? Is at a point across the mechanisms that trigger the final string within the instrument? Is it at my fingers' muscles? Is it in my brain as a part of mental causation?

Let us suppose that causality is not a problem here. Although this view is as narrow as it is simple to grasp, it is not embedded in a philosophical perspective nor does it solve the problems of sound individuation that I have pointed out and, most importantly, it is not committed to any of the positions of SO.

The latter claim needs to be developed. O'Callaghan states that this perspective is committed to EV, and so far it seems to be the case: events, in general, might be individuated following those standards, especially when we emphasise duration, spatiotemporal location[10] and causal sources. What could we conclude if other views covered such standards within SO?

With PV1, all standards are covered. The spatiotemporal location is proximal, and the duration is that of sound perception, even in the cases of the duration puzzles I have proposed.

PV2, where the properties are those of the sounding objects, localises sounds in a distal sense, that is, at the place of the "sounding" objects. The duration standard can be easily endorsed by this view, as it points out to the duration from T1 to T2 in which the object is "sounding". The causal source, finally, is by any means eluded by PV1 as it points to the cause that triggers the displaying property of the sounding object and, even more than with EV, causality here seems to be more relevant.

Finally, WV is engaged with causality in a scientific sense and we cannot ignore it. It also circumscribes spatiotemporal boundaries in terms of wave propagation.

Therefore, this option is not engaged to any particular view in SO in any specific sense.[11]

Moreover, this characterisation fails to account for more basic concerns regarding how to refer to "a sound" and the mechanisms we used to make linguistic representations of sound. This is, alas, a field where we cannot find a particular tendency of any view towards a plausible explanation. Let us take a closer look at this other aspect of SI, also often overlooked.

4. Is sound a sortal or mass term? SI as a linguistic problem

In philosophical treatises devoted to the discussion about sound, we can find expressions like the following:

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As I observed above, spatiality is in itself a problem for SO.

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There are other aspects to point out while discussing EV and SI. Provided that sounds are events and, thus, that EV is true, then SI would be a species of the problem of individuating events. Carol Cleland (1991) assesses the issues concerning event individuation, for instance: that of spatiotemporal location, material constitution or causal definitions. The latter, being defended by Davidson, is ruled out given its circularity; that of material constitution is ruled out in a similar way to Castaneda's (1975); and that of spatiotemporal location is clearly *the issue* while addressing sounds, since two different events can co-locate (see Casati and Varzi 1996). In the light of this, Cleland proposes to understand the event individuation by means of *change*.

"Sounds as we experience them in hearing are audibly independent from ordinary material objects in a way that colors and shapes are not visibly independent from objects." (O'Callaghan 2007a, 6)

In other languages, for instance German, sounds appear sometimes as the term "Ton". While addressing Brentano's theory of the inner consciousness of time (*Zeitbewusstseins*), Husserl mentions the following:

"Wenn z. b. eine Melodie erklingt, so verschwindet der einzelne Ton nicht völlig mit dem Aufhören des Reizes bzw. der durch ihn erregten Nervenbewegung. Wenn der neue Ton erklingt, ist der vorangegangene nicht spurlos verschwunden, sonst wären wir ja auch unfähig, die Verhältnisse aufeinanderfolgender Töne zu bemerken, wir hälften in jedem Augenblick einen Ton (…)."[12]

Both passages offer interesting arguments for a philosophical conception of sound, and those conceptions will be examined here. However, what I want to emphasise is a particular use of language: that of the plural form "sounds" or "Tönne".

The possibility of plural form entails that there are *many* sounds, as there can be many apples, many persons, many cats, and many wars. In the philosophical literature, the terms 'sortal' and 'count' have been used by Locke (1998) and, later, in a broader discussion about this type of terms by P.F. Strawson. The philosophical account of this is the debate on whether some general terms are mass or sortal-count.[13]

This inquiry is relevant in the sense that here SI also interests the linguistic representation of sound. And, if my intuition is correct, the lack of clarity on the matter of the nature of sound, and therefore in SO, affects its linguistic representation, for which there is also more than one option. These options are, in such view, the count-sortal and mass-applicable.

Typically, "Water", "Snow", and "Grechka" are mass terms, whereas "Apple" and "Cat" are not. In the wide discussion about mass and sortal-count terms, the main issues refer to the decisive criteria by which to distinguish a mass from count term; whether the differences rely on syntactic or semantic aspects; how is this formalised, etc. Here, I want to query the status of "sound" and "sounds" in relation to mass and count terms.

In a way, "sound" has a 'double life' (Ware 1979, 20); that is, it can be used in both ways:

1. *Mass-use*: I recognise the sound of a cat is different from the sound of a bobcat.
2. *Count/sortal-use*: This guitarist is a virtuoso: with a single move of his hand you can hear many sounds.

But how is this possible? What is at stake? Let us start with what is *not* at stake. One of those things, for instance, is what is commonly known as 'dummy sortals' (Laycock 1979, 93), that is, terms that are, apparently, sortals, such as "thing" or "object", but, indeed, are not picking any particular that could be counted or mass-referred. That is what happens with the terms "auditory object" (Bregman 1994), and "sound object" (Schaeffer 1966, Augoyard 2006), as used in the theoretical discussion about sound.

One of the most problematic points in the discussion is that of deciding whether the problem is syntactic or semantic. By syntactic we would refer to the grammatical specificity that mass or sortal terms have in a sentence. And semantically, the question is rather related to the meaning of the term in the sentences.

In semantics, the differences focus on the quantifiers that each term accepts: in the case of mass terms we might say "much", like "much sand"; in the case of sortals, we use "many" as "many jaguars". In the case of sound, none of the two modifiers is completely natural. However, the example above makes use of the expression "many sounds", and it makes sense. But, while using the modifier "much", it is clear that an expression such as: "Your violin does not produce too much sound."[14] actually refers to a quality of sound, namely intensity or volume. In the first sentence, neither intensity nor volume plays a significant role, whereas in the second, the word sound refers specifically to these qualities. The second sentence could also be an example of the use of the word "sound" to refer to the quality of sound. Here we have an important difference, but it is still not enough to sustain that a sound is a count-sortal term.

Nevertheless, the fact that the term "sound" admits numerals and is countable supports the idea that sound is indeed a count-sortal term.

Regarding the syntactic-semantic discussion, the appeal to syntactic differences pays attention to the sentence structure, because in some cases a mass term, such as "beer", admits a numeral, as in the expression "Give me three beers.". However, in this case, there is an omission of the actual countable term: a bottle, a glass, a jar, and so on. Such syntactic problems do not seem to allude directly to the case of sound.[15]

Consider the semantic option. Even if we could decide that the problem of sound is more semantic than syntactic, that definition would still carry some complications. Some of the problems for the semantic account do not apply to the case of sound/sounds, for instance, the phase sortals. The term *phase sortal* refers to something that is expected to become another thing, like "puppy", "baby", "caterpillar" and so on. In this sense, "sound" belongs to an acoustic spectrum where there are other registers, such as "infrasound". However, for any speaker, it would not have much sense to talk about a sound that was or will become infrasound.

Some syntactic considerations offer the possibility of conversion: whether sortals can be reduced to mass terms or the other way around (Pelletier, Schubert 2002, 9). In our case, it seems that we have to look somewhere else.

One important remark about semantic considerations is that they are ontologically grounded. Quine (1960) offers some mereological considerations that we can take as possible criteria:

1) *Divisibility*: A mass term is divisible without affecting its unified reference, whereas a count term is not divisible. "Gold" and "water" are divis-

12
"If, for example, a melody is heard, the single sound does not disappear completely with the cessation of the stimulus or the nervous movement excited by it. When the new sound is heard, the preceding one is not without a trace, or else we would be incapable of noticing the circumstances of successive sounds; we would have a sound at every moment (…)." (Husserl 1928, 375)

13
The single term "count" often appears when the focus is on mass terms (its metaphysics, logic, and so on). The discussion is quite extensive and beyond the scope of this paper.

14
In English it would certainly be easier to say something like "it sounds good" in its verbal use in order to refer to quality, or "it sounds loud". The possible scenario that I envision for such a sentence to be used is that of a musical instruments store, where a potential buyer is trying several violins.

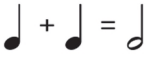
15
Although one could dare to ask if a musical note is a sort of container.

ible, because if you divide an amount of "Gold" or "Water" you still have "Gold" or "Water" – and this is not a problem regarding the amounts in litres or kilos. But if you divide "rose" or "cat", you would have half a rose or half a cat.

2) *Cumulativity*: In Quine (1960, 91) this goes by the name 'distributive reference'. In the opposition to 1), if you add more gold to the gold you have or more water to the water you have, you still have "Gold" and "Water", and not, say, "two golds", "two waters" and so on, unless there is an implicit reference to containers or conventional measures. In the case of "cat" or "rose", you would have "two cats", "two roses", and so on.
3) *Countability*: Possibly, this is the main criterion. As Pelletier and Schubert observe: "A count [sortal] expression is supposed to refer to a discrete, well-delineated group of entities, whereas a mass expression refers without making it explicit how its referent is to be individuated or divided into objects." (Pelletier, Schubert 2002, 3) Thus, a sortal expression is countable (to the extent that the term sortal sometimes appears just as 'count'), whereas a mass expression does not (of course, unless a magnitude device is established to determine quantities and so on, but then the reference is to those magnitudes, not the mass term itself).

The question is: how do these criteria apply to the case of "sound"?

The problem is that "sound" has, regarding 1) and 2), the same conditions as a mass term, whereas it also complies countability the way a count-sortal would. Fortunately, to represent this we can use musical notation. If you add two quarters, you will have a half note:[16]



If we agree to this, then we have an object-like entity whose cumulativity is mass-like, and yet it can be counted. However, this picture is not entirely right. Two quarters have the same duration as a half note. And if you accumulate two quarters, they remain two quarters. Why? Because there is a boundary between them. O'Callaghan would say that each quarter has a different causal source; the guitarist would say that he pulled the string *twice*, not once. For the divisibility criterion, we could use the same picture but in the opposite direction.

The concept playing a significant role here is *boundary*. What is the nature of that boundary? Perceptive? Let's turn to spatial entities. When we have two material bodies, say, two cats, it is rather strange to ask ourselves about the boundary between the two cats, even if they are curled up next to each other, or with meters of distance between them in the street, perceptively we *identify* the two cats as being two cats because of their shapes. Here we are again coming across, once again, the problem of visualism and the visual strategies of individuation. When we turn to this temporal object, which is sound, whose materiality if any is always dubious, the boundary seems to be established between the durations of two sounds. If such durations are equal in their continuity, the distance between them, even if they are "continuous" (as two notes next to each other), is a kind of discontinuity, even if not a pure and definitive silence.[17]

Having two causal sources and the existence of a boundary are quite different things. Having one causal source and having a replica is exemplified by the

case of echoes, which have the same causal source as the primary sound to which they are related. O'Callaghan admits that they share the same causal source (2007b, 413), and even if echoes do not challenge his theory of sounds in the most general aspects as SO, they do challenge the notion of the causal source as a criterion of individuation.

Regarding the presence of both massive cumulative and divisibility features and sortal countability, the sound seems to have them both, and this leads us to an apparent inconsistency.

The fact that in some languages, like Chinese or Turkish, plural forms are considered redundant whenever there is a numeral (like saying "14-cat"), raises the question of whether this problem is only a matter of representation in certain languages, but not in others. A deeper consideration on this could even be threatening for the canon in the analytic philosophy of language.[18] It is here that the connection between this representation of sound, as a medium for individuating sound, and SO is evident.

Moreover, although the discussion on the nature of sound is philosophically relevant, it is also interesting to the natural sciences. Other phenomena seem to also be mass terms. We could think of 'friction', 'viscosity' or 'light'. 'Friction' and 'viscosity' are relational properties[19] of objects in the natural world, and so they are not particulars. Light is different. Granted, we do not say "two lights", and it seems to be strictly a mass term (Moravcsik 1975). Yet we do not manipulate light the way we manipulate sound.[20] One could think of different emissions of light in the generation of an artificial art object, the way a song is made of sounds. But, for what it is actually a reference for physical phenomena it seems that we could use "sound" as mass, say sound_M, when referring the physical phenomenon, and "sound" as count-sortal, say sound_s, when referring particular sounds.[21] This type of solution is not strange for this kind of debates, and it also leaves room for a conventional approach such as the distinction between stuff and things, parts and objects, members and sets.

16
"Note" in itself is a dummy sortal, and because of that, we are not incurring a violation here. A nuance is necessary here. Musical notes already obey a set of conventions on which an empirical individuation criterion has already been applied, and this is independent of the cultural musical background. Since this is clear from the beginning, in the anthropology of music it is possible to set forth models that are built upon the conventions of music and musical sound itself (being this from the starting point individuated). Alan Merriam's model, whose matrix connects "the musical sound", with the performed behaviour, and conceptualization about music (Merriam 1964, 32), is a good example.

17
This would give some room to Roy Sorensen's reflections about the perception of silence (Sorensen 2008).

18
Since early considerations in analytic philosophy (like those of Tarski, or Carnap) paying attention to the importance of linguistic frameworks, the clause "in English" (like this or that statement such as the well-worn 'The Snow is white' in English is true iff…) has been used in order to sort out translation difficulties (well noticed by Quine 1960). Without the need of taking a Derridean road, one could fairly criticise that there is a monolinguism here that operates in the configurations of many of the discussions present in the analytic philosophy of language, and the development concerning the count-sortal/ mass terms is not only not an exception but, as seen, a typical case where this discussion may work for some Indo-European languages, but not in other linguistic families.

19
Actually, viscosity is a kind of friction.

20
There is a scenario where it makes sense. The streetlights, for instance, you could say "this is the red light and not the green one".

21
A similar consideration can be found in Andringa (2011, 84–85).

Despite this tentative solution, the ontological problem remains, and the uncertainty of defining boundaries (which usually are somewhat taken for granted while talking about objects whose spatial features are more or less clear) is still present.

5. Conclusions

I outlined three questions for this inquiry to conduct and to put together the synoptic, critical and explorative parts of this article. There are two possible answers to the question of why SI as been, commonly, overlooked or avoided. It has either been marginalised as a philosophical debate because of its intrinsic difficulty, seen as a hindrance to further theoretical development, or it has been regarded as too simple an issue (as in the case of delimitating basic sound) and, therefore, not one that requires deeper philosophical analysis. The latter would imply that SI does not affect SO. From what I have elaborated in this paper, I think SI has been neglected for at least two reasons:

1. SO remains unresolved
2. Diversity of possible philosophical prospects, showing the urge to revisit the arguments for SO.

When I mentioned a 'mismatch' in the cases in which there are potential associations between views in SO and SI, what I wanted to point out is that there is not a necessary connection between them. But should there be one?

Let's look at the case of the count-sortal/mass distinction. A particularity of such view is its theoretical independence from SO, in the sense that it does not have to choose a view for developing arguments.

The core of that perspective could be that of deciding, first of all, if the distinction (that is the count-sortal versus mass) depends on the ontological composition of the referent or not. The framework could produce two opposite statements: the distinction is ontologically dependent *vs*. the distinction is ontologically independent.

Does this distinction solve any of the problems of §1? It is clear that this prospect is an elaboration from the philosophy of language, but it is also clear that the identified authors in this discussion are not especially close to the second Wittgenstein. It could be said, however, that when analysing the terminology itself, problems such as the ones I pointed out in §1, could be *dissolved*.

As we turn to the difficulties posited in the linguistic representation of sound and its entanglement with individuation through the discussion of count-sortal/mass terms, there is a point where we reckon that the individuation of entities and like-entities greatly troubles the methodology of philosophy. The case of sound not only takes this route, but it even exacerbates the conundrum as it exhibits one of the issues usually taken for granted in the philosophy of language.

These issues are related to reference. While stating a proper name we "select an individual" through language, however, how can we select it without identifying it? Isn't it that knowledge would be a precondition, in certain contexts, for the utterance to *actually* select anything?

Not only that, but the language is in many circumstances, at least in an empirical level, a *sound-made artefact*. This would show that maybe individuation is more relevant than it seems when it is considered as an appendix of the regional ontology that SO is, for this case.

At this point, one thing is clear: many of the complications we have to face are related to the views in SO and to the impasse state in which that discussion is until now. Of course, the core of this problem is the nature of sound, which also affects the way it is linguistically represented, allowing for multiple approaches to both count-sortal and mass terms, but not letting us know if we can or should choose between a syntactic or a semantic criterion. Something that the case of sound shows, in this regard, is that, *a fortiori*, the nature of the referent – we could call this an ontological criterion – *does affect* its linguistic representation, whether or not it determines it. We can fairly claim that, in this case, it is because of the nature of sound that we can use both count-sortal and mass terms.

Should views in SO be challenged? Besides a matter concerning disciplinary inclinations, the conundrum arises when we start considering alternatives to WV. For sure, there are reasons for the hegemony of WV that go beyond the hegemony of scientific discourse; for instance, because it complies with common rational standards such as simplicity, explanatory depth, falsifiability and so forth. If we choose WV, the discussion for SI loses a great deal of its actual significance. We would be discussing the beginning and the end of a wave manifestation, its periods, its tendencies and so forth, and many other things rather than whether a segment of a wave could be considered a particular, or not. Would that be a straightforward endorsement of a form of physicalism? Maybe.

It seems that SO has not, and maybe will not, resolve in favour of a particular view. But it also seems that SO itself is 'infamously difficult' to resolve.

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Jorge Luis Méndez-Martínez

Što se računa »kao zvuk« i kako »izbrojati« zvuk

Problem individuiranja i identificiranja zvuka

Sažetak

Istraživanje se bavi problemom individuacije zvuka (sound individuation – *SI) i vezom s* ontologijom zvuka *(*sound ontology – *SO). Tvrdi se da problemi SI-a, poput aspacijalnosti, ekstremne individuacije, indeksikalne zamršenosti i različnosti trajanja postoje zbog nesigurnosti SO-a. Uz to, opisujem gledišta u SO-u, uključujući gledište o valu (wave view – WV),* gledište o svojstvu *(the* property view – *PV) i* gledište o događaju *(*event view – *EV), kako ih brani Cassey O'Callaghan. Prema O'Callaghanu, EV nudi jasne standarde za individuaciju zvuka. Međutim, tvrdnji se suprotstavlja razmatranje da se standardi mogu braniti bilo kojom pozicijom SO-a, stoga EV ne rješava ni jedan od navedenih problema. Da bi se pokazale poteškoće naslijeđene imanentnom ontologijom zvuka, razmatra se problem jezikoslovnog predstavljanja. Problem SI-a može se razviti unutar okvira filozofije jezika i, napose, u svezi s raspravom o masovnim* usuprot *brojeće-sortnim terminima. Je li termin* zvuk *masovna ili brojeće-sortna riječ? Pokazuje se da, zbog razloga pripadajućih SO-u, pitanje ostaje otvoreno. SI je, stoga, pokriveno od SO-a do filozofije jezika.*

Ključne riječi:

zvuk, individuacija, identifikacija, akustika, ontologija zvuka, događaj, masovni termini, brojeće-sortni termini

Jorge Luis Méndez-Martínez

Was zählt als „ein" Klang und wie man einen Klang „zählt"

Die Probleme des Individuierens und Identifizierens von Klängen

Zusammenfassung

*Dieser Aufsatz befasst sich mit dem Problem der Individuation des Klangs (*sound individuation – *SI) und ihrer Verbindung zur Ontologie des Klangs (*sound ontology – *SO). Es wird argumentiert, dass die Probleme von SI, wie Aspatialität, extreme Individuation, indexikalische Wirrnis und die Puzzlehaftigkeit des Dauerns auf die Unsicherheiten von SO zurückzuführen sind. Darüber hinaus beschreibe ich Standpunkte in der SO, einschließlich Wellentheorie (*wave view – *WV), Eigenschaftstheorie (*property view – *PV) und Ereignistheorie (*event view – *EV), wie Cassey O'Callaghan sie verteidigt. O'Callaghan zufolge bietet EV klare Maßstäbe für die Individuierung von Klängen. Dieser Begründung ist jedoch die Erwägung entgegengesetzt, die Maßstäbe könnten auch von irgendeiner Ansicht in der SO verteidigt werden, sodass EV keines der oben genannten Probleme löse. Als ein Weg, um die Schwierigkeiten aufzuzeigen, welche von der dem Klang innewohnenden Ontologie geerbt sind, wird auch das Problem seiner sprachlichen Repräsentation angesprochen. Das Problem der SI kann im Rahmen der Sprachphilosophie und insbesondere hinsichtlich der Diskussion über Massen- gg. zähl-sortale Begriffe entwickelt werden. Ist der Begriff* Klang *ein Massen- oder ein zähl-sortaler Terminus? Es wird gezeigt, dass aus Gründen, die die SO betreffen, die Entscheidung über den Fall von* Klang *als Massen- bzw. zähl-sortalem Begriff dahingestellt bleibt. SI wird somit von der SO bis zur Sprachphilosophie abgedeckt.*

Schlüsselwörter

Klang, Individuation, Identifikation, Akustik, Ontologie des Klangs, Ereignis, Massenbegriffe, zähl-sortale Begriffe

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Qu'est-ce qui compte comme « un son » et comment « compter » un Son

Le Problème d'individualisation et d'identification des sons

Résume

*Cet article traite du problème de l'individualisation du son (*sound individuation – *SI) et de sa relation avec l'ontologie du son (*sound ontology – *SO). Il est avancé que les problèmes de SI, tels que l'aspatialité, l'individuation extrême, la perplexité indicielle et les énigmes de durée sont dus aux incertitudes de SO. Par ailleurs, je décris les vues dans SO, y compris la vue d'onde (*wave view – WV*), la vue de propriété (*property view – PV) et la vue d'événement (*event view – EV*), comme Cassey O'Callaghan les défend. Selon O'Callaghan, EV propose des normes claires pour l'individualisation des sons. Cependant, cette affirmation est contrée par le fait que les normes pourraient également être défendues par n'importe quel vue de SO, de sorte que EV ne résout aucun des problèmes mentionnés. Afin de montrer les difficultés héritées de l'ontologie intérieure du son, le problème de sa représentation linguistique est également abordé. Le problème de SI peut être développé dans le cadre de la philosophie du langage et, en particulier, en ce qui concerne la discussion entre les termes de masse par opposition aux termes compte-sortaux. Le terme son, est-ce une masse ou un compte-sortal ? Il est démontré que, pour des raisons relevant de SO, la question reste ouverte. SI est donc couvert de SO jusqu'à la philosophie du langage.*

Mots-clés

son, individualisation, identification, acoustique, ontologie du son, événement, termes de masse, termes compte-sortaux