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## *Against the Primary Sound Account of Echoes*

GREGORY FOWLER

Casey O’Callaghan (2007a, 2007b, 2009a, and 2009b) endorses what I call ‘the Primary Sound Account of Echoes’ (for short, ‘PSAE’). PSAE holds that ‘the echo just is the primary sound’ (2007a: 407). The following passage further elucidates PSAE:

Suppose you are at a fireworks display. You stand in an open field with a single brick building behind you. A colorful bomb’s recognizable boom follows on the heels of its visual burst, but a moment later the boom’s echo sounds at the brick wall behind the field. You have just heard a *primary sound* followed by its *echo* (2007a: 403; italics in original).

On PSAE, the boom and its echo are like Mark Twain and Samuel Clemens: they are one and the same. And similarly for other echoes: Every echo is identical to the sound it is associated with, according to PSAE. More formally:

**The Primary Sound Account of Echoes (PSAE):** For every echo *E*, (i) there is a sound *S* such that *E* is an echo of *S*, and (ii) for every sound *S* such that *E* is an echo of *S*, *E* is identical to *S*.

My primary concern here is to argue against PSAE. Whether PSAE is true is important. The nature of echoes is interesting in its own right. Furthermore, accounts of echoes can have implications concerning the nature of sounds, *inter alia*. Indeed, O’Callaghan endorses PSAE precisely because it allows him to defend certain theories of sounds from worries involving echoes. As we will see, these theories are indeed rendered problematic by my case against PSAE.

One tempting argument against PSAE is based on the following case: Bryce and Chuck stand together midway between a wall and a building scheduled for demolition. Then the explosive charges fire and the building implodes, making the sound of a building imploding. A compression wave travels through the air to Bryce and Chuck’s ears and they each hear the sound of

the building imploding. The wave rebounds from the wall and soon reaches Chuck's ears again, causing him to hear an echo of the aforementioned sound. The wave doesn't reach Bryce's ears again, however, because he was whisked away before it returned.

On the basis of this case, one might argue against PSAE as follows: If PSAE is true, then the sound of the building imploding is identical to its echo (i.e. to the echo Chuck heard). But Bryce heard the former. So, if PSAE is true, he heard the latter too and, since the latter is an echo, Bryce heard an echo – the same echo Chuck heard. But Bryce didn't hear an echo. Therefore, PSAE is false.

I take this argument to be unsuccessful but think it helps to illuminate PSAE: It reveals that PSAE should be conjoined with the view that *being an echo* and related properties (e.g. *being the echo of the sound of the building imploding*) are temporary properties that a sound has only after the associated compression wave has rebounded from a reflecting surface.<sup>1</sup> Conjoining PSAE with this temporary properties view allows the following response to the argument: Bryce seems not to hear an echo merely because the sound Bryce heard wasn't an echo (i.e. didn't have the property *being an echo*) when he heard it. But the fact that the sound wasn't an echo when Bryce heard it is consistent with PSAE because it's consistent with the claim that the sound was an echo (i.e. had the aforementioned property) later, when Chuck heard the echo of the sound of the building imploding.<sup>2</sup>

However, this response leads directly to what I take to be a successful argument against PSAE based on a modified version of the Bryce and Chuck case: Chuck stands midway between a wall and a building scheduled for demolition, 100 feet from each, and Bryce stands 300 feet away from the other side of the building. Then the explosive charges fire and the building implodes, making the sound of a building imploding. A compression wave travels through the air to Chuck's ears and he hears the sound of the building imploding. The wave rebounds from the wall and soon reaches Chuck's ears again, causing him to hear an echo of the aforementioned sound. Simultaneously, the wave reaches Bryce's ears for the first time and he hears the sound of the building imploding, after which he is whisked away.

The argument based on this case is similar to the previous argument: PSAE implies that Bryce heard an echo of the sound of the building imploding, but he didn't. And the temporary properties view doesn't help here. Given PSAE, Bryce heard a sound that was an echo (i.e. had the property *being an echo*)

1 Note that conjoining PSAE with this temporary properties view no more modifies PSAE than does conjoining it with the view that there are trees. (Thanks to an anonymous referee here.)

2 On the temporary properties view, there remains a sense in which it is true that Bryce heard an echo, since the sound Bryce heard was an echo after he heard it. (This sense is similar to that in which it is true to say of someone who knew Barack Obama in 1982 that she knew the president of the USA.) But there is nothing clearly counterintuitive about the claim that Bryce heard an echo when that claim is understood in this sense.

when he heard it. But he didn't.<sup>3</sup> (Think of it this way: Although PSAE and the temporary properties view together imply, rightly, that Bryce couldn't correctly say 'What I'm hearing *is* an echo' in the unmodified case, they imply that he could in the modified case, which seems absurd.)

PSAE's proponent might respond as follows: The sound Bryce heard was an echo when he heard it. We mistakenly judge that it wasn't (and that Bryce couldn't correctly say 'What I'm hearing *is* an echo') because Bryce didn't hear the sound as an echo and we recognize this.

This response fails. True, Bryce didn't hear the sound he heard as an echo. But although this explains why *he* would judge that he didn't hear a sound that was an echo when he heard it, it doesn't explain why *we* judge that. At least when informed of relevant facts concerning compression waves, we are better than someone who doesn't hear something as an echo at determining whether that person nonetheless hears an echo. Consider a case in which Chuck parachutes into the area between the demolition site and the wall just in time for the rebounded compression wave to reach his ears. In considering this case, we recognize that Chuck doesn't hear the echo as an echo. But we still correctly judge that he heard something that was an echo when he heard it.<sup>4</sup> So, recognizing that someone doesn't hear something as an echo does not make us mistakenly judge that it wasn't an echo when she heard it, *contra* the proposed response.

Another successful argument against PSAE is based on the following case: On their upcoming trip to the Grand Canyon, Devon and Ellie plan to each shout 'Hello!' when they reach its edge. Before leaving, they make a bet: Each bets that they will hear more echoes of their own shout than of the other's shout.

The argument is simple: If PSAE is true, then neither Devon and Ellie could win the bet if they hear echoes of both their shouts. (For PSAE holds that every echo of a sound is identical to that sound and hence implies that no

3 I intend this premiss to receive support from its intuitiveness. I acknowledge that PSAE's proponent has the option of maintaining that PSAE's virtues provide sufficient reason to deny this premiss, thus accepting PSAE's counterintuitive consequence. But I do not take this to show that my argument is problematic. C'est la philosophie! Furthermore, my argument might, in addition to strengthening the conviction of PSAE's opponents, convince those who are agnostic about PSAE and even convince some proponents of PSAE, particularly proponents who were previously unaware of the counterintuitive consequence noted. And proponents who are unconvinced might still find my argument useful in determining their commitments. (Thanks to an anonymous referee for pressing me here.)

4 I feel justified in making this assertion because (a) in considering the case described, I recognize that Chuck doesn't hear the echo as an echo but still judge that he heard something that was an echo when he heard it, and (b) the same is true of the many other people to whom I have described the case. (Thanks to an anonymous referee for pressing me here.)

shout can have more than one echo.) But one of them could win the bet in these circumstances.<sup>5</sup> Therefore, PSAE is false.

PSAE's proponent might respond as follows: Strictly speaking, neither Devon nor Ellie could win their bet if they hear echoes of both of their shouts. We mistakenly judge that one of them could win because we mistake echo experiences for echoes: We correctly recognize that Devon and Ellie could have more experiences of the (sole) echo of one of their shouts than of the (sole) echo of the other shout, which leads us to mistakenly judge that they could hear more echoes of the first shout than of the second.

This response fails because we do not generally have a tendency to confuse the number of echo experiences someone has with the number of echoes she hears. Consider a case in which a compression wave reaches a woman's ears after it has rebounded from a wall, causing her to have an echo experience. Then, after she travels a certain distance from the wall at supersonic speeds, the wave – which has not again rebounded from any object – reaches her ears once more, resulting in a second echo experience. In considering this case, we recognize that the woman had two echo experiences. But we still judge that she heard only one echo.<sup>6</sup>

This concludes my case against PSAE. As noted near the beginning, O'Callaghan endorses PSAE precisely because it allows him to defend certain theories of sounds from worries involving echoes; in particular, he uses PSAE to defend what are called 'distal theories of sound'. In the remainder, I explore what implications my case against PSAE has for distal theories if it is successful.

Let's begin with what distal theories are: Distal theories hold that 'sounds are either properties of the objects ordinarily taken to be their sources, or events that take place in or near their sources' and hence that 'sounds are located at or near their sources' and 'do not travel unless their sources do' (O'Callaghan 2007a: 403). Distal theories include: (i) Pasnau's (1999, 2000) theory that a 'sound is a quality belonging . . . to the object that makes the sound' (1999: 309) and that 'sounds either are the vibrations of such objects, or supervene on those vibrations' (1999: 316); (ii) Casati and Dokic's (1994)

5 My remarks in n. 3 also apply here.

6 A few comments are in order:

First, *mutatis mutandis*, my remarks in n. 4 also apply here.

Second, I acknowledge that there is probably more to be said about using the distinction between echoes and echo experiences to explain away intuitive judgements that are in tension with PSAE. I have presented a case in which we do not mistake echo experiences for echoes, but it remains possible that a proponent of PSAE could draw a principled distinction between cases like this one and (purported) cases concerning which we do mistake echo experiences for echoes, such as the case of Devon and Ellie. However, I am unaware of any attempt to draw such a principled distinction and do not see how to draw it; and even if I knew of such an attempt, I would not have the space to discuss it here. So I must rest content with having raised a *prima facie* difficulty for the response to my second argument against PSAE under consideration in the text. (Thanks to an anonymous referee for pressing me here.)

theory that ‘sounds are events happening to material objects’ and that ‘[t]hey are located at their source, and are identical with, or at least supervene upon, vibration processes in the source’ (Casati and Dokic 2010); and (iii) O’Callaghan’s (2007b) theory that ‘particular sounds are events of oscillating or interacting bodies disturbing or setting a surrounding medium into wave motion’ (60).

If my case against PSAE is successful, each of these theories appears to be false. For instance, O’Callaghan’s theory holds that a sound is a disturbance event – an event in which a body acts (by, e.g. vibrating) to disturb a surrounding medium. If my case against PSAE is successful, however, there are not enough disturbance events for every sound to be a disturbance event. For in a typical case in which a sound has an echo (such as O’Callaghan’s case of a fireworks display), there is only one disturbance event. But given the success of my case against PSAE, the sound and its echo are two. So while one of them may be a disturbance event, the other cannot be, and hence there will be a sound – either the echo or, presumably less likely, the sound of which it is an echo – that is not a disturbance event. Thus, if my case against PSAE is successful, O’Callaghan’s theory is false, and similar considerations would seem to show that Pasnau’s theory and Casati and Dokic’s theory are also false.<sup>7</sup>

Now I do not take this to be a knockdown argument for the claim that the distal theories are false if my case against PSAE is successful. So allow me to briefly discuss two potential challenges and explain why I find them unconvincing.

The first potential challenge notes that my argument requires assuming that echoes are sounds. For suppose that echoes are not sounds. Then the claim that there is a sound that is not a disturbance event cannot be inferred from the claims that in a typical case in which a sound has an echo, there is only one disturbance event, and that the sound and its echo are two. Thus, one might challenge my argument by denying that echoes are sounds.

But this challenge seems pretty desperate. The claim that echoes aren’t sounds is intuitively quite implausible. Furthermore, that claim seems about as implausible as the claims that Bryce heard a sound that was an echo when he heard it and that neither Devon nor Ellie could win their bet. And my case against PSAE relies on the latter two claims’ intuitive implausibility providing sufficient reason to reject them. So, if my case against PSAE

7 My argument in this paragraph is similar to a worry O’Callaghan discusses:

[E]choes appear to be distinct sounds located at reflecting surfaces. But since the brick wall, for instance, merely reflects sound waves and does not vibrate or actively disturb the surrounding medium, the distal views appear to have no sound to identify as the echo (2007a: 403).

But whereas O’Callaghan’s worry (seemingly) relies on a claim about the apparent location of echoes, my argument does not.

is successful, there is good reason to maintain that the implausibility of the claim that echoes aren't sounds provides sufficient reason to reject it. This is especially so in light of the fact that one needn't accept a claim nearly as implausible as any of the three aforementioned claims in order to resolve the conflict between my case against PSAE, my argument that the distal theories are false if that case is successful and the distal theories. One need only accept the much more plausible claim that the distal theories are false.

The second potential challenge questions a premiss of my argument: that given the success of my case against PSAE, in a typical case in which a sound has an echo, the sound and its echo are two. One might claim that this premiss is based on a misunderstanding of PSAE. For the falsity of PSAE, as that view was formulated earlier, does not entail that in a typical case in which a sound has an echo, the sound and its echo are two. It entails only that either (a) there is an echo that is not an echo of any sound, or (b) there is an echo that is not identical to the sound of which it is an echo.

But while the falsity of PSAE entails only that either (a) or (b) is true, it's clear that my case against PSAE purports to show that (b) is true rather than that (a) is true. After all, what my arguments against PSAE object to are the apparent consequences of taking an echo to be identical to the sound of which it is an echo in particular cases – cases in which, furthermore, each echo is an echo of a sound. So, if my case against PSAE is successful, (b) is true.

Of course, (b) only says that *there is* an echo that is not identical to the sound of which it is an echo. So, even one who accepts that (b) is true given the success of my case against PSAE might remain sceptical of the relevant premiss of my argument: that given the success of my case against PSAE, in a typical case in which a sound has an echo, the sound and its echo are two. This scepticism is unwarranted. Two lines of reasoning support the relevant premiss. First, it's quite plausible that every echo is like every other echo with respect to whether it is identical to the sound of which it is an echo. So, if (b) is true, it's quite plausible that in every case (including every typical case) in which a sound has an echo, the sound and its echo are two. Second, consider any pair consisting of an echo and the sound of which it is an echo. Either that pair's members are embedded in a situation relevantly similar to that in the modified Bryce and Chuck case or that in the Devon and Ellie case, or they are not. If they are, then if my case against PSAE is successful, considerations like those I appealed to in my case show that they are two. And even if they aren't, it seems as though it is possible for them to be (at least if they are typical). But then if my case against PSAE is successful, considerations like those I appealed to in my case show that it is possible for them to be two, in which case they are actually two. Thus, given the success of my case against PSAE, in any case (or, at least, in any typical case) in which a sound has an echo, the sound and the echo are two.

Thus, the two challenges to my argument for the claim that the distal theories are false if my case against PSAE is successful are unconvincing, and the argument appears to be sound. So, since my case against PSAE does appear to be successful, it seems that the distal theories are false.

But even if the distal theories are false, not all is lost for at least some distal theorists. In particular, the problems I've identified for the distal theories do not arise for modified versions of O'Callaghan's theory and Casati and Dokic's theory. Both theories, you'll recall, hold that sounds are events, with the latter holding that sounds are what I referred to above as 'disturbance events' and the former holding that sounds are what we might call 'vibration events' – events in which a material object vibrates. This allows both theories to be modified in the same way: by treating echoes as sounds belonging to a second class of events – namely, events in which a compression wave rebounds from a surface ('rebounding events'). The modified version of O'Callaghan's theory thus holds that a sound is either a disturbance event or a rebounding event, while the modified version of Casati and Dokic's theory holds that a sound is either a vibration event or a rebounding event.<sup>8</sup> These modified theories have two features that should make them attractive to proponents of the unmodified theories. First, they respect the spirit, though not the letter, of the distal theories. Second, by treating echoes as a separate class of sounds, they entail the denial of PSAE and thereby avoid my argument against the distal theories.<sup>9</sup>

The modified theories give rise to certain open questions. It is clear that we hear both echoes and the sounds of which they are echoes – which, following O'Callaghan, we might call 'primary sounds'. Since the modified theories hold that an echo is distinct from its primary sound, the question arises of whether when we hear an echo, we also hear its primary sound. (It seems plausible that we do.) And if this question is answered affirmatively, further questions arise: When we hear an echo, do we hear the echo in virtue of hearing the primary sound? Or do we hear the latter in virtue of hearing the former? Or do we hear both without hearing either in virtue of hearing the other?

8 While it is worth exploring whether Pasnau's distal theory can be similarly modified, I do not discuss Pasnau's theory any further here.

9 An anonymous referee notes, correctly, that the modified distal theories 'massive multiply' the number of sounds and imply that the vast majority of echoes are inaudible, and suggests that these consequences might be found to be objectionable. I am not at all sure that they are objectionable: Most theories of sound imply that a large proportion of sounds are inaudible; and as for the 'multiplication' of the number of sounds, it seems intuitively correct that there is a new echo – and hence a new sound – whenever a compression wave rebounds from a surface. But even if the consequences turn out to be objectionable, I would accept that fact with equanimity, since I present the modified distal theories not as theories that should definitely be accepted in light of the problems I've identified for the distal theories but merely as theories that warrant further investigation in light of those problems.

Having argued against PSAE and for the claim that the distal theories are false if my case against PSAE is successful, and having suggested a way to modify certain distal theories to avoid my argument against those theories, I am content to leave these questions for another day and for proponents of the modified distal theories.<sup>10</sup>

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## *Not every truth has a truthmaker II*

PETER MILNE

In an article published in this journal (Milne 2005), I argued that not every truth has a truthmaker, taking as starting point and exemplar this self-referential sentence, called there *M*:

This sentence has no truthmaker.

Although I emphasised the parallel with Gödel sentences, adverted to the fact that my appeals to truth and to disquotation in exposition were largely, respectively, purely Quinean semantic ascent for purposes of generalization and descent, and indicated (in a footnote) how to express truthmaker claims without use of the notion of truth, critics have chosen to focus on the notion of truth