

Lessons from beyond vision (sounds and audition)

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Casey O'Callaghan*

Abstract

Recent work on non-visual modalities aims to translate, extend, revise, or unify claims about perception beyond vision. This paper presents central lessons drawn from attention to hearing, sounds, and multimodality. It focuses on auditory awareness and its objects, and it advances more general lessons for perceptual theorizing that emerge from thinking about sounds and audition. The paper argues that sounds and audition no better support the privacy of perception's objects than does vision; that perceptual objects are more diverse than an exclusively visual perspective suggests; and that multimodality is rampant. In doing so, it presents an account according to which audition affords awareness as of not just sounds, but also environmental happenings beyond sounds.

Keywords: Non-visual perception; hearing; sound; objects of perception

1 Motivation

It is increasingly common for philosophers to acknowledge that how we understand and theorize about perception—its objects, its contents, its phenomenology—has been shaped by attention to vision. This focus is understandable. Humans undeniably are visual creatures: we rely on it, and we care about it. Vision is a salient paradigm. Nevertheless, we also are auditory, tactual, olfactory, and gustatory creatures. Attention to just one sense is bad policy if we're after a comprehensive and general account of perception, rather than a parochial story about vision.¹

*Rice University, <http://ocallaghan.rice.edu>

¹Brian Keeley reminds me that given such aims we shouldn't limit inquiry to familiar human forms of perception, and I agree. This doesn't diminish the value of casting a wider net in the human case.

Some important exceptions to the predominant, unimodal, vision-based approach have aimed explicitly at generality and have tested claims about perception beyond vision. Notable recent examples are Clark (2000), O'Shaughnessy (2000), Smith (2002), Noë (2004), and Matthen (2005). Lately, some philosophers have turned to other modalities in even more focused ways to mine insights about perception from an extra-visual perspective. Among topics that have generated interest are touch (Martin 1992; Fulkerson 201x); bodily awareness (de Vignemont 201x); smell (Lycan 2000; Batty 2010); taste (Smith 2007; Byrne and Hilbert 2008); and hearing (Casati and Dokic 1994; Nudds 2001; O'Callaghan 2007; Nudds and O'Callaghan 2009; Matthen 2010).

Each of these topics is fascinating in its own right. Each raises new questions, and each has sparked fruitful debate. Each will impact what we believe about what it is to be a perceiver. But it isn't too early to begin to take stock and start considering the payoffs.

There are at least four ways to understand the broader aims of work on the non-visual modalities. The first is relatively conservative. Suppose vision-based theorizing about perception has got the issues and ideas mostly right. Work on other modalities might aim to *translate* or find analogs to claims concerning vision. The second is more ambitious and constructive. Suppose theorizing about vision is on the mark as far as it goes, but that it leaves important gaps in our understanding of perception. Work on other senses might then aim to *extend* and plug gaps. The third is more critical. Suppose investigating modalities other than vision threatens to challenge generalizations about perception that are grounded in the case of vision. Then this work might aim to *revise* our understanding of perception. The fourth is more circumspect. Work beyond vision might aim to explore whether any *unified* account of perception applies to all forms of perception across the modalities. Martin (1992), for instance, expresses skepticism whether there could be such a unified account. Of course, one's aims might vary according to the question.

Against this backdrop, this paper has two main goals: to present the most central lessons of work on hearing, sounds, and multimodality, and to do so in a way that conveys why they matter for understanding perception. So, while it focuses on auditory awareness and its objects, it also advances some more general lessons for perceptual theorizing that are drawn from thinking about sounds and audition.

2 Vision, objects, and directness

Start with an idea that is central to understanding debates about visual awareness. It affects discussions of vision's phenomenology, objects, content, metaphysics, and epistemology. And it has had a huge impact on theorizing about perception. The organizing question throughout this paper will be whether and how it extends to audition.

The idea is that seeing involves being directly acquainted with or having immediate awareness of everyday material objects. This requires some unpacking. First of all, not everyone thinks it is true. Lots of philosophers believe arguments from hallucination and illusion show it is false. However, just about everybody agrees that the claim is plausible before doing much philosophy and that it *seems* true, pre-theoretically, because it is more or less accurate as a description of what things are like, from the subject's point of view, in run-of-the-mill visual experience. So almost everyone agrees with the idea if we interpret it *phenomenologically*, as a claim about the subjective character of naïve visual awareness. Hellie (2006, 1) puts it succinctly: "On a natural description of what a mundane visual experience is like for its subject . . . such an experience is phenomenally a direct or immediate awareness of entities in the scene before the subject's eyes," and quotes Sturgeon (2000, 9): "Visual phenomenology makes it for a subject as if a scene is simply presented. Veridical perception, illusion and hallucination seem to place objects and their features directly before the mind."

Part of the idea, understood phenomenologically, is that seeing involves acquaintance with or awareness of particulars. Valberg (1992, 19) characterizes "object of experience" as "something *present* in experience," where presence in experience "connotes a kind of direct or immediate availability." Some familiar idioms are that visual awareness is *directed at, of, or about* something, or that it has *intentional* objects, or is *relational*.

Moreover, the idea takes a stand on what the *objects* or *targets* of this awareness are. A piece of the idea that is going to be critical for the rest of this paper is that *material objects*, in what Anscombe (1965) calls the "modern sense" (which does not apply to debts), figure prominently among the particular objects of which vision apparently affords direct awareness.² What is a material object, in this sense? Examples are things like tables, chairs, watches, mugs, cars, bricks, trees, moons, and sneakers. Roughly, they're something very much like medium-sized, three-dimensional, extended, bounded, cohesive, persisting items. Brewer (2007) talks about directly

²Whether you see objects by seeing surfaces is a complication for now safely ignored.

seeing *physical objects*, about which he says, “*Physical objects* are such things as stones, tables, trees, people and other animals: the persisting macroscopic constituents of the world we live in” (87). It also is common for philosophers to talk about seeing *ordinary objects*, or just *objects*. If we wanted a single term, *bodies* would work well.

This doesn’t rule out that you’re ever visually aware of other material *things*, such as *parts* of material objects, or *events* in which material objects participate, or that you’re ever visually aware of *qualities* or *properties* of material objects, or *relations* among them. But being visually aware of each of those sorts of things standardly also involves being visually aware of material objects.

Crucially, the ordinary material things purportedly sometimes directly or immediately seen are mind-independent. They’re outside, beyond, or independent from subjective consciousness; their existence is not experience-dependent. The idea about vision is frequently used to argue that we are not ever aware of—or at least do not in everyday non-philosophical and non-painterly circumstances seem to be aware of—our own private sensations, sense-data, qualia, or internal representations. Instead, in standard daily coping, we “see through” any internal features and seem simply to see bodies in the world. This sometimes is debated under the heading of *transparency*. But all the current idea really needs to commit to is that seeing an ordinary material object does not strike one, phenomenologically, to involve, require, or depend on visual awareness *as of anything else* distinct from it (cf. Jackson 1977, ch 1). So the idea implies that it would be a phenomenological mistake to say you see a material object or its parts *by virtue of* being visually aware as of anything else, including private features (individuals or properties). From now on, when I talk about *immediacy* or *directness*, I’ll mean this phenomenological sense, which I’m using in order to remain neutral on whether the corresponding factive claims hold. Perceptual awareness as of an object in this sense is direct or immediate if it does not recognizably to its subject seem constitutively to involve or to require awareness as of something else that is not that object or part of it.³

Putting this all together again: in vision, we humans seem, phenomenologically, to have immediate or direct visual awareness of mind-independent material objects or bodies. Put in this way, it’s the crux of a massive chunk of the philosophy of perception the aim of which is to recon-

³Two things. First, I’m ignoring the difference between immediacy and directness. Bermúdez (2000) outlines good reasons to distinguish them. Not much hangs on this until §5, at which point the story gains interesting detail with the distinction. Footnote 16 explains. Second, I’m ignoring the work ‘material’ does in talk about seeing material objects. This raises delicate issues, but my main concern is the contrast with audition rather than nuances of the story about vision.

cile it with the possibility of illusion and hallucination. As I said earlier, the question is whether and how it extends to audition.

3 Audition and indirectness

Now Lycan (2000), in a paper called, “The Slighting of Smell,” says that theorizing about perception would have developed very differently if we’d started with smell rather than vision. That’s because the claim that perception involves direct awareness of things in the environment would have seemed, on phenomenological grounds, far less plausible. In olfactory experience, Lycan says we seem only to enjoy *indirect* acquaintance with material objects. You can become olfactorily aware of the cilantro by smelling it, but only through awareness of its odor. But, says Lycan, phenomenologically, the odor seems like a modification of your own consciousness (277). So, starting with smell, an indirect or representational theory of perception would have struck us as most attractive.

It’s easy to imagine an auditory analog to Lycan’s strategy. Plausibly, you hear things like guitars and ducks only by or in virtue of being aware of the sounds they make. So perhaps hearing also supports thinking we perceive material objects only indirectly, by the following reasoning:

- (1) *Immediacy*. Sounds are the *immediate* objects of auditory awareness.
- (2) *Distinctness*. Sounds are not ordinary *material objects*.
- (3) *Indirectness*. One hears material objects *indirectly* by hearing sounds.

Some take it one step further. For instance, Maclachlan (1989) argues that hearing provides special support for thinking that perception in general involves immediate awareness of *private* rather than *public* features. Maclachlan argues from (1)–(3) to (4):

- (4) *Privacy*. Sounds are *private*.

What’s really noteworthy is that Maclachlan uses auditory awareness to motivate a *general* theory of perception. Maclachlan extends a sense-data-style account to vision and the other senses only *after* introducing it for audition. He is saying that what seems perfectly intuitive and obvious in the case of sounds and hearing (but counterintuitive for vision)—that we indirectly perceive material objects only by directly perceiving internal creatures of auditory sensation—helps us to discover what is true of all perception. This is a clear example of a *revisionist* use of attention to a non-visual modality.

Maclachlan is not an obscure, isolated example. Historically, Berkeley (1713/1975) discusses sounds right after pains, tastes, and smells, but before sights. Recently, O'Shaughnessy (2000, 2009) appeals to sound to support his sense-data theory.⁴ Even Strawson (1959) says that if you experienced only sounds, you'd experience nothing as being independent from yourself—a purely auditory experience lacks the materials for awareness of objective particulars.

What makes this line of thought attractive at all? The obvious problem is that even if we accept (1), (2), and (3), it still is not the case that (4), *Privacy*, is mandatory.

Skepticism about spatial audition is behind the inference. As in the case of olfaction and smells, the privacy of sounds is motivated by thinking that auditory awareness fails to place sounds beyond the ears. Suppose we accept:

(5) *Aspatiality*. Auditory experience is *aspatial*.

How does *Aspatiality* help secure *Privacy*? Given (5), audition's immediate objects are not experienced auditorily as located in the space surrounding one's body. If sounds do not auditorily appear to inhabit the same space as material things (in the world beyond the ears), this lends support to the intuition that they are private, like headaches, rather than public. You might wonder where else they could seem to be if not "out there." Or you might think seeming to be "out there"—or public—just is seeming to be located in extra-bodily space. Or you might think sounds fail to meet what the Kantian tradition regards as the spatial requirement on objective experience.⁵ The line of thought thus concludes that it is intuitive, on phenomenological grounds, to understand sounds as private features, by which one perceives or which one associates with material objects.

Skepticism about spatial audition has good pedigree. Strawson (1959) says a purely auditory experience would be aspatial and that spatial notions have no inherently auditory significance: "I shall take it as not needing further argument that in supposing experience to be purely auditory, we are supposing a No-Space world" (66). Others, including Malpas (1965), Evans (1985), Maclachlan (1989), Nudds (2001), and O'Shaughnessy (2009), agree that in some way or another audition is deficient with respect to spatiality. For instance, O'Shaughnessy says,

⁴Perkins (1983) discusses hearing right after smell and feeling heat and cold, but before vision, in his defense of an indirect perceptual theory.

⁵Apparent distal spatial location and apparent objectivity might come apart, as perhaps they do in smell (Smith 2002, ch 5) and afterimages. Conceptually, at least, the *spatial* and *mind-independent* senses of 'out there' should be kept clear.

... [W]e absolutely never immediately perceive sounds to be *at* any place. (Inference from auditory data being another thing). (O'Shaughnessy 2000, 446)

And,

I am of the opinion that perception at a distance is uniquely visual in type. All other varieties of perception encounter their object without spatial mediation. ... I believe, and will in what follows attempt to prove, that this holds at least for the case of sound. (O'Shaughnessy 2009, 114)

Nudds says,

In characterising the contrast between auditory and visual experience in the way that I have I am attempting to draw attention not merely to the fact that the auditory experience has a different spatial structure, but that it has a structure that is non-spatial. ... [W]hen we hear (or appear to hear) a sound we simply hear the sound, and we don't experience it as standing in any relation to the space it may in fact occupy. (Nudds 2001, 213–14)

Skepticism about spatial audition in fact might take a number of forms. One might say: audition bears no spatial *information*; audition is *non-spatial*; audition lacks spatial *content*; auditory *experience* is non-spatial; auditory experience *inherits* spatial content from other modalities, or is *parasitically* spatial; or auditory experience lacks spatial *structure*.

There are different strategies for responding to skepticism about spatial audition. One might, for instance, appeal to *empirical* considerations, such as behavioral evidence or other research on spatial audition that details how information about both direction and distance is encoded auditorily (see, e.g., Blauert 1997). Or one might appeal to *phenomenological* considerations and contrastive arguments to show that auditory experiences present sounds as located in some direction at a distance from their hearers, or at least that sounds are experientially externalized. I've tried each of these approaches, and the debate evolves in different ways depending on the form of skepticism.⁶

My diagnosis, however, is that skepticism about spatial auditory experience rests on a few confusions. First, everyone grants that hearing is far less spatially acute than vision. The spatial

⁶Defenders of audition's spatiality include Pasnau (1999); Matthen (2005); Casati and Dokic (2009); O'Callaghan (2007, 2010).

resolution of audition differs by roughly an order of magnitude from that of vision. But skepticism mistakes diminished accuracy and detail relative to vision for a lack—an absence, rather than an impoverishment—of spatial content. Second, audition’s immediate objects are not auditorily experienced as having rich internal spatial structure. You probably don’t hear sounds to have detailed three-dimensional shapes and determinate sizes (things are trickier with dolphins and bats). To infer from this (as Strawson does) that audition is inherently aspatial mistakes a claim about the apparent spatial structure of audition’s objects for a claim about the spatial structure of auditory experience. Third, the relative sparseness with which auditory space is populated contrasts with ordinary daytime vision. It is entirely common to find an object or feature at every angle within the visual field but far less common to hear more than a few sounds at different audible locations at any given time. Sparse population, however, does not rule out a spatial field, as looking at a night sky with only a few visible stars shows.

I’ve focused on the use of (5), *Aspatiality*, to get from (1)–(3) to (4), *Privacy*. I’ve tried to block this route by claiming that arguments against spatial audition fail, so (5) is unavailable as a way to reach (4). Therefore, even if sounds are heard as distinct from material objects, and even if material things are heard in virtue of hearing their sounds, the immediate objects of auditory awareness still might be public rather than private.

The upshot of this discussion is that without denying that sounds auditorily seem located somewhere in space, there is no special reason to think audition lends more support than does vision to the view that perception’s immediate objects are private. Phenomenal externalization suffices to meet spatial requirements on objective experience. Moreover, good indications support thinking sounds strike us as public. We plug our ears to cease hearing sounds we regard to persist; sounds exhibit constancy for loudness, timbre, and pitch across changes to perspective and listening conditions; sounds are shared topics of conversation, and commonly are a public nuisance. Sounds, unlike headaches, can be hallucinated or misperceived.

Nevertheless, there remains a disanalogy between vision and audition that could bear on theorizing about perception. I’ve assumed that sounds are immediate objects of audition, that sounds are distinct from material objects, and that hearing ordinary material objects and happenings requires hearing sounds. Under these plausible assumptions, material things are heard indirectly by hearing the sounds they make. If so, then *Indirectness* in audition does signal an important difference from vision. It is phenomenologically apt as a description of auditory experience to say that we hear things like weedwackers and mosquitoes *by* or thanks to hearing the sounds they

make. However, no straightforward analog to this apparent indirectness is phenomenologically apt as a description of visual awareness of material objects, which involves no perceptible public intermediaries.

It is worth pausing to emphasize the main lessons so far. First, audition lends no special support to thinking that the immediate objects of perception are private rather than public. This sort of revisionist appeal to sounds and hearing fails because, while not all claims about spatial experience translate from vision to audition, the ones central to perceptual objectivity do. But there is a noteworthy difference between vision and audition. Audition, but not vision, seems paradigmatically to involve at best *indirect* awareness of material objects.

4 The diversity of perceptual objects

One might, however, wish to deny the disanalogy. One might deny that audition is indirect in a way that vision is not. Perhaps (3) is false or misleading.

Suppose the objects of veridical perceptual awareness, in general, are ordinary material bodies. Extrapolating from vision and touch, this is natural to say. Armstrong (2004, 20) says, “In perception, properties and relations are attributed to objects.” Shoemaker (1990, 97) says we experience sensible qualities “as belonging to objects in our external environment—the *apple* is experienced as red, the *rose* as fragrant, the *lemon* as sour.” Siegel says,

When properties are represented in experience, they are often attributed to ordinary objects: for instance, one may have a visual experience that attributes redness and sphericity to a tomato, or a haptic tactile experience that represents smoothness and cylindricality of a cup in one’s hands, or an olfactory experience attributing scents to flowers, or a gustatory experience attributing deliciousness to something one is chewing. (Siegel 2008)

And Brewer (2007, 88, 96) accepts, “Physical objects are the direct objects of perception,” as “absolutely true.”

How does the claim translate to audition? The main obstacle is (2). Sounds, the immediate objects of auditory awareness, aren’t ordinary material objects. A sound is perceptually unlike a table or a goat. But there is room to maneuver. Even though *distinctness* connotes physical separateness or independence, sounds might be just *non-identical* to material objects.

Perhaps, then, sounds are *audible attributes* of ordinary material objects such as bells, whistles, and firecrackers. The proposal is that humans hear sounds as qualities or properties of material objects, just as we see colors and shapes as qualities and properties of material objects. In that case, we hear material objects by or in hearing their sounds only if we see material objects by or in seeing their colors and shapes. This dissolves the disanalogy between auditory and visual awareness with respect to (3), *Indirectness*.

Pasnau says,

Sound [is] a quality belonging, not to the medium, but to the object that makes the sound. ...[W]e should conceive of sound as like colour, rather than as like light. ...That is to say, we should continue to treat sound as the object of hearing, and we should think of sounds as existing within the object that “makes” them. (Strictly, on my view, we should say that objects *have* sounds). (Pasnau 1999, 309, 316)

Kulvicki (2008) agrees but defends a view of sounds as standing dispositions of objects: “Sounds are *stable properties* of objects that seem to have them” (2).⁷

This looks like a very promising approach. It preserves the idea that material objects and their attributes are the objects of perceptual awareness. Plus it leaves auditory awareness of material objects no more indirect than visual awareness.

We should, however, resist it. Identifying sounds with audible properties or qualities of material objects is a mistaken attempt to translate into audition a plausible claim about vision and touch. It involves a failure to recognize the *diversity of perceptual objects*. In particular, it fails to recognize the diversity of types of *individuals* that are objects of perceptual awareness.

Part of the trouble is how freely we use the term ‘object’ when speaking about objects of perception. Even where context doesn’t settle what’s meant, it is not common enough in discussions of visual awareness carefully to distinguish among *intentional objects*, *causal objects*, *objects of predication*, *ordinary objects*, *material objects* (in both of Anscombe’s senses), and so on.⁸ This often doesn’t cause much harm because these different notions of *object* tend, for visual awareness, to land in the same neighborhood. Audition is not so cooperative. Suppose by ‘objects of auditory awareness’ we’re talking about *intentional objects*, whatever is heard. Unless we smuggle in some

⁷Locke says in the *Essay* that sounds are secondary qualities of *bodies*. Unfortunately, it isn’t wholly clear whether by ‘bodies’ he meant the objects or the medium.

⁸Consider also *proper/common objects*, *direct objects*, *immediate objects*, *attentional objects*, *physical objects*, *perceptual objects*.

other notion of *object*, such as *ordinary object*, *material object*, or *object of predication*, which it is very tempting to do if we're thinking visually, then we've left unresolved whether we're talking about ordinary material objects, properties of material objects, or something else entirely. Saying that sounds are among the intentional objects of hearing cannot settle what kinds of things sounds are or seem to be.

So what sort of thing is a sound, construed as an immediate object of auditory awareness? The best response is that sounds are audible *individuals*. First, sounds *have* or *bear* features—sounds are characterized by their pitch, timbre, and loudness, which are audible qualities. Moreover, multiple sounds are audible simultaneously, as when you hear a click nearby and a buzz far away. And there is an instance of the Many Properties problem for sounds (see Jackson 1977; Clark 2000): hearing a loud, low-pitched sound on the left and a soft, high-pitched sound on the right differs from hearing a loud, high-pitched sound on the left and a soft, low-pitched sound on the right. This motivates the introduction of audible individuals, in addition to audible attributes, to capture the respect in which the latter are bound to or qualify a single perceptible item.

One might object that ordinary material objects solve the Many Properties problem if *they* are the audible bearers of audible qualities. If so, sounds need not be counted among perceptible *individuals*, after all. This approach has shortcomings. In particular, it fails to capture the respect in which sounds are creatures of time. Sounds, like visible material objects, perceptually seem to *persist* and to *survive changes* to their features over time: a single sound can begin low-pitched and loud and become high-pitched and soft. Therefore, if sounds are audible properties of material objects, they are complex, temporally-extended *patterns* of audible attributes. This, however, still leads to trouble, which concerns thinking that material objects are, in the first instance, the audible individuals to which audible properties (sounds, on the current proposal) are attributed. There is an important difference between how audible individuals and how visible objects perceptually seem to persist. Audible individuals perceptually appear to have *duration*—to take time. Moreover, they are perceptually individuated and identified in virtue of patterns of change in their audible attributes through time. What distinguishes a police siren from a fire siren, or an utterance of 'forest' from an utterance of 'troughs', is a pattern of audible characteristics over time. An audible individual's apparent manner of persisting (the way in which it perceptually seems to persist) thus differs from that of a visible ordinary object. An audible individual does not strike one perceptually as being wholly present at any given time, in the plausible sense that what is present at that moment suffices for being that thing. Audible individuals require time to occur, unfold, or

stream. In contrast, visible material objects strike one perceptually as being wholly present at a given time, in the sense that all that's required to be that thing is there at an instant. Thus there is a strong case that audible individuals, construed as immediate objects of audition, are not the ordinary *object-like* individuals we see.

All of this supports the claim that sounds, construed as intentional objects of auditory awareness, are audible *individuals* that bear audible qualities like pitch, timbre, and loudness. Moreover, sounds are not treated perceptually as ordinary object-like individuals. Instead, given their temporal profiles and apparent manner of persisting, sounds are treated perceptually as *event-like* individuals.⁹

This sort of account, according to which audible sounds are event-like individuals, highlights the way in which time in audition plays a role analogous to one role of space in vision. In visual awareness, space and spatial features figure critically both in the visible (external) structural relations among objects and in the visible (internal) structures of individual objects. In auditory awareness, space and spatial relations do figure in the audible (external) structural relations among sounds. But it is far less obvious that space plays any role as part of the audible (internal) structures of individual sounds. Time and temporal features, however, figure critically as part of the audible (internal) structures of individual sounds.

Perhaps surprisingly, given all of this, philosophers and psychologists recently have talked about *auditory objects* on a par with *visual objects*.¹⁰ What sense does it make to say that vision and audition both involve object perception? A common notion of *perceptual object* does survive that applies to both vision and audition. This common notion is stronger than that of an *intentional object*; however, it is more general than that of a *material object*. And it is more informative than that of *object of predication* or *feature bearer*. My proposal is that both vision and audition involve awareness as of *mereologically complex individuals*. These objects bear features, but also may have complex part-whole structures. I do not want this conception to rule out simple individuals as perceptual objects, so simplicity is the lower limit of mereological complexity. What it must allow is that perceptual objects have proper parts that are treated collectively as a single perceptible unity. It also must allow that perceptual objects of different varieties differ in internal structure. For instance, visible material objects have a complex spatially-extended internal structure. Audible sounds or

⁹I say '-like' because I'm not asserting that there is a genuine metaphysical difference between the manners in which objects and events persist. However, there is a difference, which might come in degrees, in how we perceptually regard them as persisting, and that is what I wish to capture.

¹⁰See, e.g., Kubovy and Van Valkenburg (2001); Scholl (2001); Matthen (2010); Nudds (2010).

auditory objects have a complex temporally-extended internal structure. This conception helps to vindicate the space:vision::time:audition analogy. It also provides a psychologically interesting conception of a perceptual object. Similar perceptual processes in visual and auditory sensory systems suggest a common form of object perception (Matthen 2010). This conception thus yields both a more diverse view of the types of individuals that are objects of perception and a more general account of perceptual objects than many traditional approaches recognize. It's an advance over the quietist view that all perception has intentional objects, the cautious view that perception involves awareness of sensible individuals, and the implausibly strong visuocentrism according to which all perceptual objects are ordinary material objects.

Here, then, are the lessons. Audition's apparent indirectness cannot be overcome by identifying sounds with audible properties of material objects. Sounds and auditory objects are event-like individuals. The main lesson, however, is that the objects of perceptual awareness are more diverse than an exclusively visual perspective suggests. This is an example of *extending* our understanding of perception through attention to non-visual modalities.

5 Multimodality

A problem remains. It concerns perceptual access to material things beyond sounds. Once we recognize the diversity of perceptual objects, how do we explain auditory awareness of anything other than sounds? I've argued that sounds, understood as individual objects of auditory awareness, are neither ordinary material objects nor audible properties of material objects. Nevertheless, while sounds apparently are among the immediate objects of auditory awareness, the thought remains that material objects are heard by or in virtue of hearing sounds. Ordinary talk supports thinking sounds are *caused by* material objects and happenings involving material objects: sounds are *generated, produced, or made* by cymbals, babies, and vuvuzelas. However, a causal relation can stand in the way of awareness. For instance, normally, you don't have visual awareness as of material objects by or in virtue of having visual awareness as of something else causally downstream.¹¹ In particular, a publicly perceptible causal intermediary can be a barrier to visual awareness. Seeing smoke is not seeing fire. The problem is especially acute across modalities. It is natural to say the causes of sounds are seen but not heard.

Do humans simply *infer* the presence of material objects on auditory grounds, or *associate* ob-

¹¹I am counting photographic and televisual seeing as not normal.

jects with sounds? If so, we never experience even *indirect* auditory perceptual awareness as of material things beyond sounds. I don't think we should give up so easily. It really is plausible that sometimes we hear sound sources. And I am not just appealing to phenomenological introspection. We reflexively turn to look for the source of a sound, or duck out of the way when we hear something coming from behind, but it makes no sense to look for or duck from a sound. Part of audition's function is to tell us about what is going on in the extra-sonic world. Lots of empirical evidence suggests that auditory experience is organized in a way that cannot be understood without considering sound sources.¹² Appeals to inference or association should be a last resort.

So, given that sounds apparently are immediate but public objects of auditory awareness, and given that sounds are neither material objects nor properties auditorily ascribed to material objects, how could material things other than sounds even be among the mediate or indirect objects of auditory awareness? Given (1) and (2), how could even (3) be true?

I want to develop a solution in two parts.

Part 1

The first step is to recognize the extent to which perceptual awareness is *multimodal*. On a certain traditional way to develop empiricism, the senses are discrete, experientially encapsulated modes or channels of awareness. This conception treats perceptual modalities as *explanatorily independent*, and so it encourages another kind of unimodality in perceptual theorizing: that of investigating different modalities in relative isolation from each other. Different sensory systems, however, interact and influence each other. Recognizing and exploring this has been among the most dramatic developments in the cognitive science of perception during the past decade. Perceiving doesn't just involve vision, hearing, touch, smell, and taste working in parallel and in isolation. It involves extensive cooperation and coordination among modalities. Unimodal approaches risk missing the significance of an important class of multimodal perceptual phenomena.

Some of the most telling evidence comes from *crossmodal recalibrations* and *illusions*.¹³ Here are five nice examples, ranging from familiar to odd. *Ventriloquism* involves an illusory auditory experience of spatial location that is caused by the visible location of an apparent sound source (see Bertelson 1999). The *rubber hand illusion* involves visual capture of touch and proprioception (Botvinick and Cohen 1998). The *McGurk effect* is a profound illusion in which vision alters

¹²See Nudds (2010) for a very instructive discussion.

¹³See also Clark (2010) on crossmodal cuing of attention.

the speech sound you auditorily experience (McGurk and MacDonald 1976). The *motion-bounce illusion* occurs when an audible blip makes a visible display switch from looking like two discs traversing crossing paths to looking like two discs colliding and rebounding (Sekuler et al. 1997). In the *sound-induced flash illusion*, the presence of two audible blips leads to an illusory visual experience as of two flashes when there's really only one flash (Shams et al. 2002).

It is important to distinguish these sorts of crossmodal perceptual illusions from *synaesthesia*, which is rare, isolated, quirky, and robustly illusory. Crossmodal illusions are widespread—among and within individuals—and they are caused by perceptual principles that in general are intelligible as adaptive and advantageous. Crossmodal organizing principles help to resolve *conflicting* information across different sensory systems, and they commonly correct for noise and errors. The really central point is that conflict resolution requires selecting bits of information that “belong together” and thus are potential targets for recalibration. Of course, genuine conflict requires a common subject matter, so, in effect, this is a matter of determining which bits of stimulation from different senses concern the same subject. This is reflected in what researchers have called *unity assumptions* that govern crossmodal recalibrations (Welch and Warren 1980; Vatakis and Spence 2007). This all suggests that subpersonal perceptual systems implement a way of grasping or representing the common sources of stimulation to multiple modalities, and that this grasp or manner of representing is not unique or distinctive to any of the individual modalities across which information is reconciled. Doing conflict resolution exhibits a shared grasp on a common subject matter.

What's noteworthy here is that the upshots of this are evident in multimodal perceptual experiences. Consider the difference between two kinds of cases.

- (a) Seeing something to be red while feeling something to be rough.
- (b) Perceiving the very same thing seen to be red as also feeling rough.

Other examples involve different senses and features sensible through them. A perceptual experience of type (a) has content of the form: $\exists xFx \ \& \ \exists xGx$ (or: *o is F and p is G*). A perceptual experience of type (b) has content of the form: $\exists x(Fx \ \& \ Gx)$ (or: *o is F and G*). Moreover, if (a) is not also a type-(b) experience, then (a) and (b) differ in phenomenal character. In experience (b), but not in (a), you perceptually experience that which has the visible features to be *the very same thing* as that which has the tactual features. Type (b) experiences are ones in which crossmodal binding

is evident.¹⁴

The difference between type (a) and type (b) experiences isn't limited to thought experiments, Oliver Sacks-ish disorders, or rarified lab conditions. We have lots of experiences of each kind. When watching a movie with sound, your experience is of type (b). If the movie is a poorly dubbed foreign film, or if its soundtrack is temporally offset from the appropriate visual cues, you go from having a (b)-type experience to an (a)-type one. Crossmodal *identification* breaks down. But movies (and lab scenarios with video screens and headphones) involve illusory crossmodal binding, since the visual and auditory stimuli lack a common source. Watching and listening to everyday talkers, however, involves veridical crossmodal binding.

The important point is that (b)-type experiences are irreducibly multimodal. That $\exists x(Fx \ \& \ Gx)$ (or: *o is F and G*) cannot just be the content of a combination of experiences each of which is proprietary to a single modality. That is, such an experience cannot exhaustively be characterized in terms that are entirely distinctive to individual modalities because characterizing it requires mentioning awareness as of features (individuals or properties) shared among experiences otherwise associated with different modalities.¹⁵

How does all of this help solve the puzzle? It follows that sometimes you perceptually experience the thing you hear *as* being the very same thing you see. Since you don't see sounds, there must be *something else* you hear and also see. There's something common, apart from a sound, that you auditorily *and* visually experience—and in such a way that the identity is experientially evident. That something might be a material object.

But the problem remains: causation can be a barrier to awareness.

Part 2

The second part of the solution is an alternative proposal about the relation between audible sounds and sources. I've argued that sounds aren't audible properties of material objects but instead are complex audible individuals. Nonetheless, I do want to capture the phenomenological sense in which sounds are heard to be sounds *of* things like colliding cymbals, grinding gears, and backfiring automobiles. But I want to avoid cashing this out in causal terms according to which one hears sounds as causal byproducts or mere effects of ordinary material objects and

¹⁴See also the closely related discussion of common sensibles in Tye (2007).

¹⁵Even if you think perceptual experience contents are Fregean modes of presentation (even sense-specific ones), the perceptual experience of intermodal identification must be captured.

happenings. Instead, suppose sounds, understood as immediate objects of auditory awareness, are heard as *constituent parts* of events or happenings that also involve material things apart from sounds. For instance, there is an event which is the grinding of gears. When it takes place in the presence of a surrounding elastic medium, it includes a sound. The sound of the grinding gears is heard in the manner of an event-like individual. Rather than as a mere effect, though, the sound is heard as *part of* the event of gears grinding. The grinding of the gears audibly includes a sound as a constituent part of it.

The advantage of this sort of account is that parthood commonly does ground a relatively unproblematic form of perceptual awareness. In seeing a table's surface, we become aware as of the table. In seeing unhidden bits of building, we see the building. Similar claims hold for events. Seeing the baseball game doesn't require seeing every moment or every part of it. One can blink, step to the restroom, or focus on the catcher and still see the game. So, in hearing the sound, we hear the automobile collision or the grinding of the gears. We hear that more encompassing event by hearing an audible part of it. The sound is akin to the facing surface of an object. Through awareness of the parts, we become aware of the whole.¹⁶

This account does not deliver auditory awareness as of material *objects*, exactly. Rather, it explains auditory awareness as of events that in fact do involve material objects, such as the closing of a car door or Miranda speaking. This strikes me as the right first step, since it is not clear that we can single out material objects auditorily in the way we single out events in which they participate.

A potential problem for this account is that seeing material objects by seeing their facing surfaces is in one respect disanalogous to hearing environmental events by hearing their sounds. When you see a material object by seeing its surface, it is still possible to bring other parts or surfaces of that object into *view*. But when, purportedly, you hear a car crash by hearing its sound, you cannot bring certain other kinds of parts of that more encompassing event into *earshot*. For instance, you cannot bring the visible surfaces of objects involved in that event, or changes to shapes, colors, solidity, or texture, into earshot. These other aspects of environmental events are, from the point of view of audition, akin to the hidden insides of some visible object. In what sense, then, do you ever hear or auditorily experience anything beyond a sound? In other words, why

¹⁶If you prefer to distinguish *immediateness* from *directness* à la Bermúdez (2000), and to say hearing the whole is *mediated* by hearing the part, you still might say one *directly* hears the whole if one can demonstratively refer to it. I believe the account presented in the text does provide the resources to satisfy Bermúdez's reference condition.

say you hear the more encompassing event or *multimodal perceptual object*, rather than just its parts or aspects which are immediate *and* proper objects of audition?

My response is that the relevant possibilities for awareness are not restricted to a particular modality; they concern possibilities for experiences *across* modalities. So while you cannot bring the surfaces of objects involved in these complex events into earshot, you can bring them into view, and you can touch them. Furthermore, this kind of expectation or understanding figures into your auditory experience. You hear a sound *as* the sound of something that could be seen or brought into view, and that has visible features. Much as seeing a surface to have occluded parts impacts your visual experience of it, and hearing a sound to have temporally masked parts impacts your auditory experience of it, perceiving an auditory object to have seen or unseen visible parts impacts your experience of it. (Blindness, then, affects auditory experience.) This fits well with the account of multimodal awareness described above to show how one could perceptually experience something heard as something that is or could be seen. Hearing such broader environmental events is in an important sense multimodal. Its phenomenal character cannot be characterized in purely auditory terms; it involves awareness *as of* something that could be seen. This account explains both the reflexive drive to orient visually to sound sources and the lack of effort required visually to identify a sound source as such.

To recap, the immediate objects of auditory awareness, sounds, are not ordinary material objects, nor are they secondary qualities or sensible properties of material objects. Instead, they are event-like individuals. Sounds, on the account I've proposed, are heard as constituents of broader environmental events ordinarily understood to make or have sounds. We hear these happenings, such as car crashes, by or in virtue of hearing their sounds. In particular, we hear how such events are from an auditory perspective. In the resulting picture, complex multimodal objects, construed as mereologically complex individuals, are among the objects of perceptual awareness.

The virtue of this account is that it explains the respect in which audition affords awareness as of ordinary material things, as well as the intuition that we're auditorily aware of such things by or in virtue of hearing their sounds. It doesn't require holding that sounds are private or that awareness as of an effect grounds awareness as of its cause. It addresses the motivations behind (1)–(3) without accepting (4) or (5). That is, we capture the spirit of *Immediacy*, *Distinctness*, and *Indirectness*, while rejecting *Aspatiality* and any special case for *Privacy*.

The big lesson of this section is that multimodality is rampant. Unimodal approaches disguise the degree to which perception and perceptual awareness are multimodal, and they risk failing

to characterize even experiences associated with a given sense modality. In this section, I've tried to provide an example of how to both *revise* and *extend* our thinking about perception by casting attention beyond vision. It may even shed some light on how to develop a *unified* story.

6 Recap of the lessons

I began with an intuitive difference between vision and audition. Vision, but not audition, strikes us as involving immediate or direct awareness of ordinary material objects. Audition, on the other hand, has been thought to provide mediate or indirect awareness of material objects and the happenings in which they participate, since the immediate objects of auditory awareness are sounds, and hearing material things and happenings depends on hearing sounds.

Contrary to what some philosophers have argued, however, this does not imply that audition lends greater support than does vision to an account according to which the immediate objects of perceptual awareness are private rather than public. Such an argument depends upon an implausibly strong form of skepticism about spatial aspects of auditory experience. Rejecting skepticism about spatial audition clears the way for an account on which the objects of auditory awareness are public.

One way to reject the disanalogy between visual and auditory awareness is to hold that sounds are audible properties of material objects, just as colors are visible properties of material objects. I argued against such a view on the grounds that it fails to recognize the diversity among types of individuals that are objects of perceptual awareness. Audition's objects are best understood as occurrent individuals that take time to unfold; auditory objects are temporally-extended, event-like individuals. As such, they differ in structure from vision's objects. Nevertheless, a common notion of *perceptual object* applies to both vision and audition. This notion is stronger than that of an intentional object and more informative than that of an object of predication or individual, but it is more general than that of a material object. The relevant conception of a perceptual object is that of a *mereologically complex individual*.

Finally, I proposed an account of how audition furnishes awareness as of things beyond sounds. In addition to sounds, *multimodal perceptual objects* that are not proprietary to any particular modality are among the objects of auditory awareness. The key to understanding how this is so is to recognize the extent to which perceptual awareness is multimodal. The advantage of this kind of account is that it recognizes the *diversity* of perceptual objects once we abandon an exclusively

visual perspective but also captures the *unity* of perceptual objects across modalities.

So the lessons are:

- (i) Sounds and audition no better support the privacy of perception's objects than does vision.
- (ii) Perceptual objects are more diverse than vision suggests.
- (iii) Multimodality is rampant.

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