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ORIGINAL RESEARCH

Seeing the Invisible: How to Perceive, Imagine, and Infer the Minds of Others

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Abstract The psychology and phenomenology of our knowledge of other minds is not well captured either by describing it simply as perception, nor by describing it simply as inference. A better description, I argue, is that our knowledge of other minds involves both through 'perceptual co-presentation', in which we experience objects as having aspects that are not revealed. This allows us to say that we perceive other minds, but perceive them as private, i.e. imperceptible, just as we routinely perceive aspects of physical objects as unperceived. I discuss existing versions of this idea, particularly Joel Smith's, on which it is taken to imply that our knowledge of other minds is, in these cases, perceptual and not inferential. Against this, I argue that perceptual co-presentation in general, and mind-perception in particular, yields knowledge that is simultaneously both perceptual and inferential.

It has recently been argued (Smith 2010, 2015; cf. Husserl 1982) that our knowledge of other minds is akin to our knowledge of the concealed parts and surfaces of physical objects. Just as the rear side of something is perceptually present when we look at the front side, but *as unseen*, so other people's mental states are perceptually present when we perceive their expressive behaviour, but *as private*. Call this the 'Co-Presentation' view. This is taken to show that we can under the right circumstances perceive other minds, and thus to refute 'inferentialism', the idea that we know other minds only by inference.

I think the Co-Presentation view is correct, and does show that we perceive other minds. But this is not incompatible with us inferring them—co-presentation need not support a perceptual *as opposed to* inferential model of knowledge of other

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minds. In this paper I develop a version of the Co-Presentation view which not only fits with inferentialism, but implies it.

In Sect. 1, I outline the core of the Co-Presentation view and its relation to 'perceptualism' on the one hand and 'inferentialism' on the other. In Sect. 2, I distinguish different versions of it, including existing versions that make behaviour partially constitutive of mental states, and my version, which does not. In Sect. 3, I discuss the role of imagination in both co-presentation and mindreading, showing the compatibility of simulation theory and the Co-Presentation view, and vindicating the latter's claim to be a perceptualist theory. Finally, in Sect. 4 I show that mind-perception is also substantively inferential, and thus that the Co-Presentation view does not support perceptualism *against* inferentialism.

1 Inference, Perception, and Co-Presentation

The Co-Presentation view has so far been offered as a form of 'perceptualism', and thus as a reaction against a certain traditional view that we may call 'inferentialism'. Inferentialism goes back at least to Descartes' remark that:

> I normally say that I see the men themselves… yet do I see anything more than hats and cloaks which might conceal automatons…? I *judge* that they are men. And so something I thought I was seeing with my eyes, is in fact grasped solely by the faculty of judgment. (Descartes 1985, p. 21)

The idea is more fully developed by Mill

> I am conscious in myself of a series of facts connected by an uniform sequence, of which the beginning is modifications of my body, the middle is feelings, the end is outward demeanour. In the case of other humans beings I have the evidence of my senses for the first and last links of the series, but not for the intermediate link… [I] conclude that there must be an intermediate link… [and] by supposing the link to be of the same nature as in the case of which I have experience… I bring other human beings, as phenomena, under the same generalizations which I know by experience to be the true theory of my own existence. (Mill 1889, p. 244)

The idea here is that knowledge of other minds is separated from directly perceptual knowledge by a distinct 'inferential' step, i.e. one which takes perceptual knowledge as an input or 'premise', and applies to it some rational principle that is also employed more generally in our reasoning about non-mental things (below I refine this definition of 'inferential'). There is room for disagreement over the exact nature of this rational principle: on some accounts it is an *argument by analogy* from similarities between our behaviour and others' (as Mill seems to say), on other accounts it is an *inference to the best explanation* of observed behaviour (e.g. Russell 1948, pp. 482–486). Other versions of inferentialism might appeal to different rational principles.[1]

[1] For instance, views on which mental state terms are defined functionally, by their role in a theory (e.g. Lewis 1972), or on which mental states are ascribed in accordance with principles of charity or rationality (e.g. Davidson 1984).

Recent debates on knowledge of other minds have been between the 'simulation theory' and the 'theory theory', but both are broadly continuous with traditional inferentialism. According to simulation theory, the essential mechanism by which we think about the minds of others is the 'simulation' of another's mental state in our own minds, albeit often in ways that are involuntary or unconscious (e.g. Heal 1986, 1996; Gordon 1992, 1996, 2008; cf. Hellie 2013). According to the views which are grouped together as 'theory theory', we think about other minds by constructing a 'folk psychology' in essentially the same way that we learn to predict the behaviour of machines, fluids, or other inanimate objects (e.g. Churchland 1991; Gopnik and Meltzoff 1996).

Note that while simulation theory and theory theory differ on the mechanisms involved, this need not not translate into an epistemological difference. To say that we 'imagine' or 'simulate' being someone does not by itself say why this yields knowledge of that person's actual state, since imagination is not obviously a source of knowledge to rival perception or inference: it may simply implement or support them.[2] More generally, the simulation/theory debate does not strictly entail any answer to the question of inference vs. perception, since there is room to argue that both simulation and theoretical knowledge can enter into processes that qualify as either inferential or perceptual. In Sect. 3, in fact, I argue that some uses of simulation qualify as perceptual. I call simulation theory and theory theory 'broadly continuous' with inferentialism simply because both posit a two-step cognitive process leading to knowledge of other minds: perception of external behaviour works one way, and then a second step (simulation or application of theory) works some other way.

There are broadly two ways to criticise inferentialism: on its own terms, as involving a weak or faulty inference, or as identifying the wrong sort of process. The first way involves such objections as that an argument by analogy from one's own case would be based on only a single instance, and thus very weak: in this paper I will not consider such objections, though I think they can be defeated (see e.g. Hyslop and Jackson 1972).

What I will consider instead is the objection that, even if a solid inference to other minds could be drawn, our actual relation to other minds is nothing like the drawing of an inference. We do not approach other people like scientists, collecting observations and constructing hypotheses about an unobserved mechanism. We relate to other people far more immediately and directly than scientists relate to their postulates. Our interaction with others seems to reveal them, complete with their mental lives and experiences, as immediately 'there', present to us.[3] One way to bring this out is to attend to the fact that people generally struggle to identify the behavioural cues guiding many mental-state ascriptions, and may not even be disposed to accept correct descriptions of those cues when given them.[4] Another is

[2] There is room for significant dispute about the exact contribution that simulation makes: whether it provides premises concerning the self, or people generally, or rational structures, or enables the structure of 'ascent routines' in which object-level questions (e.g. whether P) are answered to provide answers to higher-level questions (e.g. whether I, or someone else, believes that P). For a discussion of some of these different accounts of the reasoning that simulation could underlie, see Gordon 1996; Heal 2000.

[3] I am not sure how best to analyse this idea of 'immediate perceptual presence': perhaps it can be reduced to some sort of 'vivacity' or 'liveliness' *à la* Hume, or perhaps it must be taken as a phenomenological primitive. I am grateful to an anonymous referee for pushing me on this point.

[4] These latter considerations were emphasised in correspondence with Michael Huemer.

to attend to the apparent possibility of robust illusions about minds. For example, suppose someone is trying to deceive me by acting pleased and excited about something they are actually angry over, and suppose moreover that, unbeknownst to them, I have found out about their real feelings. Their performance may be so good that I cannot help but experience them as happy, even while reminding myself that it's an act. The representation of happiness seems to persist even when it conflicts with my beliefs, and the possibility of such illusions seems to suggest a perceptual, rather than purely cognitive, process.

Even if the above style of criticism is not decisive, it raises a challenge to inferentialists to give an account of this sense of immediacy and this apparent independence of belief. And this challenge is buttressed by empirical evidence suggesting that awareness of at least some mental states, like intentional movement, is handled in early visual areas (see, e.g. Scholl and Gao 2013).

These sorts of worries might drive one towards the rival position that I have called 'perceptualism', on which the minds of others can be right there in the content of perception. Wittgenstein seems to express this sort of view:

> We do not see facial contortions and make the inference that he is feeling joy, grief, boredom. We describe a face immediately as sad, radiant, bored, even when we are unable to give any other description of the features… In general I do not surmise fear in him – I see it. (Wittgenstein 1980, §§570, 170)

So according to perceptualism, mental states are in an important sense on a par with physical states: just as we can see people's hair colour and posture, we can see people's emotions and desires—not *all* of them, since sometimes we do have to infer someone's mental state, but enough. Inference functions only to build up from perceptual knowledge, and when we do have to draw an inference we can recognise that situation as unusually indirect (e.g. when we see that a friend has done something surprising, and must infer their likely reasons).

The most famous defence of this sort of view comes from behaviourists and verificationists (Ryle 1949, pp. 20–21; Malcolm 1958). But one need not be a behaviourist to accept perceptualism—we might simply think that our basis for ascribing someone a mental property is the same sort of base-level 'seeming' as our basis for ascribing someone a physical property (e.g. Dretske 1966, pp. 80–96; Avramides 2015; cf. Huemer 2001, 2007). Moreover, much recent perceptualist theorising draws heavily on the work of phenomenologists like Husserl and Merleau-Ponty, who are not behaviourists in any standard sense (see, e.g. Gallagher 2008; Zahavi 2011; Krueger and Overgaard 2012). A good example is Gallagher (2008), who criticises both simulation theory and theory-theory for assigning primacy to 'mind-reading', which he understands as "something like an inference from observed behavior to a set of inaccessible mental states." (p. 168). Against these Gallagher offers 'Interaction Theory', a perceptualist theory on which "The other person's actions and expressions are already meaningful and are perceived as such."(p. 168)

The problem for perceptualists is that, even if they reject behaviourism, they have trouble accounting for the intuitive idea that mental states are private: that each person's mind is not directly available to others but only to themselves, contrasting

with the equal access that everyone has, in principle, to physical facts. Surely it is part of the very idea of subjective mental states that they are not publicly observable things which other people can 'just see' (cf. Jacob 2011, p. 531). To put mental states on a par with physical states, featuring together in the content of perception, seems to imply that your knowledge of *my* expressed mental states can be on a par with *my* knowledge of them (even without any repression, self-deception, etc.). But this seems importantly wrong: when you perceive my angry face, you do not have access to my conscious anger in the way I do. Indeed this is what seemed so right about inferentialism: another's mental life really does seem to be in some important way concealed from me, in a way that their behaviour is not, and the two-step process posited by inferentialists makes perfect sense in light of this.

Although many perceptualist and inferentialist writers clearly see an important opposition between 'inference' and 'perception', it is not always obvious how to understand this distinction. Here are three disagreements that people might have in this vicinity:

1. Phenomenological: one side holds that it can be part of the content of perceptual experience that somebody feels something, thinks something, or is in some other mental state,[5] while the more 'inferentialist' side either denies this or, in the extreme, holds that this awareness always has an opposite 'inferential' phenomenology, as of our actively reasoning to a conclusion;
2. Psychological: one side holds that the processes that generate our awareness of other's mental states are sometimes 'perceptual' in that they function to channel information from the environment to the mind, with significant independence of background beliefs, while the other side holds that these processes are basically 'inferential' in that they work according to rational principles and admit of at least some access and control by the subject;
3. Epistemological: one side holds that our beliefs about other minds are sometimes 'perceptually justified', meaning not only that their content is the same as the content of a prior perceptual state, but also that our justification or warrant for holding them comes simply from this fact, while the other side denies this and holds that our justification or warrant is conditional in some way on the presence of good evidence and the validity of some reasoning process.

'Perceptualism' and 'inferentialism' will be sharply-defined categories to the extent that our everyday notions of 'perception' and 'inference' assume a lining-up of these oppositions, so that whatever is in the content of perception arises from psychologically perceptual processes, and provides epistemologically perceptual

[5] This could be loosely expressed by saying that we perceive the mental property, or perceive the state of having that property, if this does not imply that these are the specific *objects* of perception in any way that goes beyond featuring in perception's content. It is better to say, not that we see someone's pain, but that we see them *as* in pain. In addition to claims about seeing mental states, seeing people as in mental states, and seeing that people are in mental states, Smith (2015) also considers claims about people looking to be in mental states. I will assume that this goes with seeing-as: if someone can look sad, I can see them as sad, and vice versa.

justification, and whatever has inferential epistemological and psychological roles will remain outside the content of perceptual experience.[6]

It is possible, however, to envisage various intermediate options, and indeed in the course of this paper I will defend an account which sides with the perceptualist in debate 1, with the inferentialist in debate 3, and with both in debate 2. Thus I claim that mind-perception is at once:

- Phenomenologically perceptual: others' mental states feature in perceptual content;
- Psychologically perceptual: mind-perception arises through perceptual processes;
- Psychologically inferential: mind-perception arises through inferential processes;
- Epistemologically inferential: mind-perception justifies beliefs only conditionally.

In Sect. 3 I explain and defend the first two of these claims, and in Sect. 4 I explain and defend the last two. Part of my case is that this same profile, combining perceptual and inferential elements, applies to the more general phenomenon of perceptual co-presentation, to which the Co-Presentation view appeals to make perceptualism compatible with the different forms of access we seem to have to mental and physical properties (Smith 2010, 2015; Krueger 2012). So let us consider this phenomenon.

'Co-presentation' is a label for the way that we routinely experience objects as having features beyond the immediately perceptible: we are thus perceptually aware of those features despite being in some sense unable to perceive them. This label, along with 'adumbration' and 'horizon', are used by authors in the phenomenological tradition (Husserl 1970, 1982, 2001; Merleau-Ponty 1962; cf. Kelly 2004); a different label, drawn from experimental psychology, is 'amodal perception' (contrasting with 'modal completion', Michotte et al. 1991).

Standard examples involve seeing three-dimensional objects with fronts and backs. There is a narrow sense in which we see only their fronts: the other side is concealed. In a broader sense, however, we see the object itself, a whole with a front and back, giving us an indirect awareness of its back, simultaneous with our awareness that we are not aware of it in the same sense that we are aware of the front; it is co-presented but not directly presented. The back is co-presented by the front, because we see the front *as* the front *of* something which also has a back. Our awareness of the back lies in perceiving the front as one aspect of something with other aspects. I will say that the front is the 'revealed aspect' and the back the 'concealed aspect'.

[6] Since these three disagreements concern the status of three slightly different things - the contents of perceptual experience, the processes or mechanisms underlying awareness of other minds, and the beliefs that result from them - it is not quite straightforward to say that they concern whether some single thing ('mind-perception') is phenomenologically, psychologically, or epistemologically perceptual or inferential. But the meaning of such phrasing is hopefully clear: the question is whether the overall phenomenon of our looking at people and learning of their mental lives features experiential content, psychological mechanisms, and justified/warranted beliefs of the relevant sort.

Consider also occlusion, when we see an object as having an unbroken surface even though part of that surface is obscured by another object. We are aware of the surface we do see as continuous with the surface we do not, with some sections visually presented and other sections co-presented by them.[7] My perception reveals the visible surface *as* just a portion of a single, unbroken surface. Here the revealed and concealed aspects are two portions of a single surface, rather than two surfaces of a single object. Other visual examples include cases where darkness, distance, or fog prevents us from seeing something clearly. We rarely experience the obscured object as being somehow itself fuzzy or lacking in detail—rather, we experience it as having plenty of detail, which *we* cannot make out. Insofar as we are aware of this detail as not visible, it is co-presented by the broad outlines that are presented. The rough aspect that is revealed presents itself as a rough and imperfect view of an object that can be seen in better ways.[8]

There can also be non-visual examples; for instance, Nanay (2010), p. 241 discusses the tactile experience of feeling the handle of a cup as the handle of something with other, unfelt parts. Similarly, we might think of the concealed aspects of a sound or smell as the greater intensity or complexity which any given percept might yield if we moved closer, took our hats off, or sniffed harder.

Everyday co-presentation lets us perceive things *as unperceived*. But if this is possible, could we also perceive things *as imperceptible*—which is precisely our apparent, and apparently paradoxical, relationship to other minds? The Co-Presentation view reconciles perceptualism with privacy by saying that we perceive people's minds through perceiving their bodies, just as we perceive their backs through perceiving their fronts. The difference is just that in the latter case we can easily come to perceive what is concealed (someone's back) as revealed, while in the former case what is concealed (someone's mental state) is necessarily concealed.

For instance, we might say that when we can 'see someone's anger' in their face, or 'hear the sadness' in their voice, we experience their facial expression or spoken utterance as continuous with, and thus co-presenting, an emotional state which is fully revealed only to them, and not to us. Similarly, when we spontaneously interpret someone's words as expressing some desire or belief, we perceive their propositional attitude as concealed from us but perceptually present in their voice.

Smith frames the Co-Presentation view as a form of perceptualism and as opposed to inferentialism. By contrast, Krueger (2012) argues that it fails to qualify as perceptualism, because co-presented aspects "remain a half-step removed from direct perceptual reach."(p. 154) I agree with Smith in thinking that the Co-Presentation view makes mind-perception phenomenologically and psychologically perceptual, but I agree with Krueger that it remains also psychologically and epistemologically inferential. But this intermediate status, halfway between

[7] Nanay (2010, pp.241) points out that similar things can occur without literal occlusion, as with overlapping shadows, or with partial illumination that reveals only part of an object.

[8] More examples like this are discussed by Merleau-Ponty 1962, pp. 302–311, and subsequently by Kelly 2004, who argue that co-presentation is essential to colour and shape constancy, that is, the way that we can see an object as having a constant colour or shape which we only imperfectly sense under given viewing conditions.

traditional perceptualism and traditional inferentialism, is actually an attractive feature of the Co-Presentation view. The perceptualist side explains the immediacy of mind-perception and the possibility of robust illusions, while the inferentialist side explain how mental life can still be private and distinct from behaviour, and accounts for the psychological and epistemological difference between mind-perception and body-perception. Both the classic inferentialist and their perceptualist critic are right in their positive claims but wrong in their negative claims: the first is wrong to say that we cannot perceive the mental states of others, the second is wrong to say that when we perceive mental states we are therefore not inferring them. Inference and perception are compatible, and the Co-Presentation account shows us how.

2 How are Mental States Co-Present?

Any co-presentation theorist must specify what is being co-presented, what presented things co-present it, and what unitary thing the two are both aspects of. But is the relation between mental states and bodily behaviour really anything like the relations between revealed and concealed aspects of physical objects? Certainly, it seems wrong to think of a mental state as simply the *fine detail of*, let alone another *two-dimensional surface of*, any physical movement. But perhaps we can model the mental state-behaviour relation in some other way.

Smith argues for seeing behaviour as manifesting a mental state's essential dispositions, and thereby co-presenting other possible behavioural manifestations (2010, p. 740 ff). On this view mental states are understood as functional, and their manifested dispositions co-present their unmanifested dispositions: "Seeing an object as having a… mental property involves the presentation of some things, the manifest behaviour, and the co-presentation of… the merely dispositional aspects." (2010, p. 744) The mental state itself comprises both revealed and concealed aspects, and is seen in virtue of the direct presentation of the former.

If I were a role-state functionalist, I would be happy to accept Smith's version of the co-presentation view. But for anyone who is not a functionalist, or who is a realiser-state functionalist, Smith's view is problematic. For on any of the latter views, the relationship between mental states and behaviour is causal, not constitutive (the realiser-state functionalist adds that these causal relations are what makes the mental state a mental state). This goes along with the idea that mental states are private, knowable by their subjects independently of their behavioural manifestations. But then if actual behaviour is presented, and potential behaviour is co-presented, neither what is presented nor what is co-presented is constitutive of the mental state itself.

This matters because co-presentation is not merely a matter of 'seeing that' something is true (as in what Dretske calls 'deferred perception', 1994, p. 263). A paleontologist who looks at a bone and immediately 'sees that' it was damaged by a predator millions of years ago is not thereby co-presented with the predator's bite, because that bite is not phenomenologically present: the paleontologist apprehends it as something happening millions of years ago, not as something happening here

and now. Co-presentation by contrast gives us a sense that things we cannot directly perceive are nevertheless *right there*, because the relation between revealed and concealed aspects, and the thing they are aspects of, is constitutive: by having the revealed aspect you automatically also have what it is an aspect of, and with that the concealed aspect. When the aspects are parts or surfaces, or detailed and coarse-grained properties, this constitutive relation is clearly there. When they are simply causes and effect, it is not. This is why Smith's view works only if behaviour, actual or potential, constitutes a mental state, as it arguably does on role-state functionalism: the role is constituted by the causes and effects that something has iff it plays that role.

Smith's account of the relation between mental state and behaviour is partly motivated by an objection to any analogy between mind-perception and standard sorts of co-presentation, namely that co-presentation requires the possibility of 'checking', such as moving oneself or the object to reveal the concealed. Mind-perception seems to allow no such thing: "When seeing another's frown, I cannot get a better view in order to bring the putatively co-presented misery into full presentation." (2010, p. 740). Smith offers an indirect form of checking that we can perform, namely observing someone's further behaviour to see if it "harmonises" with their previous behaviour in the way predicted by the mental states we seemed to perceive (2010, pp. 740–741).

However, there is a more straightforward response available to this objection: co-presentation does require a 'possibility' of checking, but the possibility need not be a real one. We can, for instance, experience illusory co-presentation of the 'rear side', or 'occluded portions' of a two-dimensional figure, like a drawing of a horse behind a wall (cf. Nanay 2010, p. 248–249), even though there is no way to 'look behind' one part of the image to see the other part. All we need is some idea of what checking would be, and when we see the two-dimensional figure 'as though' it could be 'looked behind', we have this. And mind-perception does involve this: when we perceive behaviour as expressing, say, a feeling, we perceive it as expressing something that *would feel* a certain way were we the other person. The possibility of checking is the possibility of being the other, a possibility we cannot actualise any more than we can actualise the possibility of looking behind a two-dimensional figure. We have a sense of something being present outside our perception of it, even though we could not actually bring it into perception.

Krueger rejects the Co-Presentation view, but the view he defends suggests a different version of it, on which behaviour is *part of* a mental state. Krueger argues that behaving in a certain way can be a constitutive element of feeling or thinking a certain way (2012, p. 157 ff). Appealing to studies showing that bodily processes play a causal role in mental processes, he proposes that the mental state itself "might plausibly be said to *span across*" the brain and body (2012, p. 167). Examples include the importance of smiling to the experience of happiness (Laird 2007; Cole 2010), the importance of gesture to the efficiency of scientific and mathematical reasoning (Goldin-Meadow et al. 2001 Becvar et al. 2008), and the importance of practicing a dance move to thinking about it (Kirsh 2010; cf. Roholot 2014).

However, Krueger's examples do not by themselves show what he needs them to, because even if using the hands or face in certain ways can augment mental processing, this relation might still be causal, rather than constitutive (see Adams and Aizawa, 2009). Acting out a dance might aid in understanding it, without the nerves and muscles of the arms, legs, and torso themselves doing anything cognitive. They might simply cause feedback to brain centres which could not be activated by direct within-brain communication. Similarly, feedback loops between facial muscles and brain centres might support emotion without the facial contortions being *part of* the emotion. Our reasons for regarding bodily behaviours as parts of mental processes are little better than our reasons for so regarding calculators, notebooks, or diagrams. Krueger himself accepts the extended mind thesis, on which we sometimes should count calculators, notebooks, or diagrams as parts of mental processes, though he hopes that "we can speak of a more modest *bodily* externalism without necessarily committing ourselves to a more radical *environment-involving* externalism." (2012, p. 157) I do not think this separation of modest and radical views can be maintained, and so anyone unconvinced by the extended mind thesis should reject Krueger's account of mind-perception. Indeed, there are forms of behavioural expression and impression that, even on an extended mind view, are not plausibly regarded as constitutive of the mental states they express or impress. For instance, suppose we see someone's shock and surprise in their dropping a plate, or other object, they were carrying just as something comes into view. Surely the act of dropping this object is not itself part of their feeling of surprise, or playing any sort of cognitive role in their processing of this new and shocking information.

The insight that mental states and their expressions are often so tightly coupled as to form a single functional unit, however, remains valid even if we do not follow Krueger in identifying this integrated unit with the mental state itself. I think the more traditional view that this process contains mental states and behaviour as distinct parts is correct, because private mental states and public bodily states seem to me importantly different. Yet the tight connections between the two suggest a third version of the Co-Presentation view, on which, the relationship between mind and behaviour is only causal, but the strength, density, and reciprocal structure of this causal relationship is enough for the *process* comprising both to be perceived in either. The process plays the role of the three-dimensional object which is seen in whichever of its sides is revealed, and makes its other sides present as concealed. Mental states and behaviour relate causally to each other, but constitutively to the process.

This claim of a visible process with mental and behavioural parts (stages) is meant to apply chiefly when a mental state is 'directly expressed', i.e. manifests itself outwardly without further decision or calculation, without artifice or effort. Paradigm instances of the relation of direct expression are between an intention to act and an attempt to act; between an emotion and a facial expression; between an attending and an orienting of the body; between pleasure or distress and movements towards or away from a stimulus; and sometimes between a belief or thought and a verbal utterance.

As well as bodily states caused by ('expressing') mental states, co-presentation can involve the reverse. When we see someone struck in a sensitive area, we wince because we see that blow as painful, i.e. pain-causing. Here the bodily state co-presents a mental state as its effect. Similar things can be said of other forms of imposition onto the body (pinches, tickles, caresses), but also of bodily states of sensory readiness, such as the opening or directing of the eyes. In well-lit conditions, the sight of someone's eyes directed at some object co-presents their visual experience of seeing that object. Rather than 'expressions', we should call these 'impressions': mental states which are co-presented as effects of bodily states can be said to be 'directly impressed', just as those co-presented as causes of bodily states are 'directly expressed'. I will use 'behaviour' to cover both expressions and impressions. The sort of process that takes place in both direct expression and direct impression, which Krueger wrongly identifies as the mental state itself, I will call a 'psychocorporeal process': most properly speaking it is the psychocorporeal process that we perceive, even though it is always the bodily part of it which is revealed.

What allows for co-presentation is that psychocorporeal processes involve tight, sensitive, causal integration between mental and bodily states, often with ongoing feedback between successive stages, within which an exact boundary is hard to identify.[9] From both functional and phenomenological perspectives, the boundary between happiness and a smile is often less salient and less meaningful than the boundary between both and a simultaneous, unrelated, thought. The smile and the feeling happen as one, each promoting and reinforcing the other, and require active effort to dissociate. Thus in cases like this we can treat the relation of 'expression/impression' as the sort of intimate connection necessary for co-presentation, and more specifically as a species of part-part relation within an integrated process. Call this the 'Causal Co-Presentation' view: we perceive mental states because their expressions or impressions co-present them in virtue of being tightly causally integrated. We perceive the psychocorporeal processes of which they are integral parts, and thereby see them 'in' those processes.

Are there other, non-mental, examples of processual co-presentation? It is easy to find cases where one temporal stage of a process seems to co-present other temporal stages. Consider watching a race: I experience myself as watching the race, and not just part of it, although for several minutes I was looking away, buying refreshments, or arriving late. This is because the stages of the race which I do see, I see *as* stages of an ongoing process with other stages. What I see just before I look away is seen as one stage of something that will continue while I am looking away.

But this kind of temporal co-presentation is not quite what we want, because the relation between mental state and expression/impression is not primarily temporal but causal: they are 'causal stages' rather than 'temporal stages'. When I see

[9] In full metaphysical rigour there might be three, rather than two, major parts - the inward mental state, the brain state, and the outward expression. The brain state and outward expression are causally related, while the mental state and the brain state might be related in some other way than by identity: as realiser and realised, as distinct properties of the same substrate or as two 'aspects' of the same underlying reality. But as long as both connections are intimate enough, we can speak of all three phenomena as occurring within a single integrated process.

someone's pain, for instance, by seeing its expression on their face or its impression through injury, all three things (injury, pain, facial expression) are ongoing, not sequential. It is harder to find clear non-mental examples with this structure, because we tend to organise perception in terms of objects rather than process—we either focus on the single object whose changes constitute a process (e.g. the moving body in a process like dancing or falling), or on the multiple objects involved in distinct stages of a process (e.g. the gun whose muzzle flashes and the target who falls down). But consider an incendiary bomb's explosion (or a volcanic eruption, or a foaming chemical reaction), which we see by seeing an expanding cloud of smoke and ash. Or consider someone who 'sees the fire heating the water', even though only the water and not the fire is directly presented; their perception has the content that there is a fire right there, because they see the bubbling of the water as one stage in a familiar, tightly-connected, process.[10]

An even closer analogue would be purely corporeal processes, such as running. If I see someone's top half above a short wall, and they are running, there is the same kind of tight, sensitive causal coupling between the upper-body muscle contractions, which are presented to me, and the lower-body ones, which are co-presented. Similar things apply to the whole-body processes of crouching, jumping, and so on. And I think it is just as appropriate in such a case to say that I see the person's running (or their jump, or their crouch) as to say that I see the psychocorporeal processes that connect, say, someone's weeping to their sadness, or their smiling to their joy.

These examples might begin to suggest a worry: we have familiar words and concepts for jumps, crouches, explosions, and so on, but I just now had to invent a neologism for psychocorporeal processes. If they are really the principal things that we perceive in mind-perception, why do we not have a ready-made term for them? The first and quickest answer is that usually, when it comes to both how attention structures our perceptions and how we report them, the ultimate focus in the *person*, not their states, properties, or processes (psychological, corporeal, or psychocorporeal). But of course we do often focus on particular things going on with a given person, including their expressed and impressed mental states, and so we can still ask: why don't we already talk about psychocorporeal processes?

The answer is that we do talk about them, in a variety of ways. One way is by using psychological adjectives with bodily nouns ('a happy face', 'an angry shout', 'a deliberate kick') or psychological adverbs with bodily verbs and adjectives ('walking cheerfully', 'greeted me eagerly', 'despondently curled up in a chair'). Though these phrases can with a little forcing be used to describe insincere 'fake' behaviour ('he was walking cheerfully to disguise his deep sadness'), they are most usually and naturally read as describing both the person's mental state, and their behaviour, and the relation between the two: for someone to be 'walking

[10] Indeed, we might even say that perception inherently has this structure: by encountering the final stages of certain light waves, for instance, we become aware of the longer process of reflection or emission that produced them. The point here is not that 'we only really see light, not objects', but simply that if we could not incorporate things into the content of perception in virtue of their causal relations, we would not have anything like our actual perceptual content.

cheerfully', in its most ordinary sense, is for them to feel cheerful and to directly express that in the way that they walk.

Another way we talk about psychocorporeal processes is by using factive perceptual language: when we say that someone 'saw an eagle', we usually mean not just that they had a mental state as of seeing an eagle, but that this state was directly impressed upon them by the light from an eagle falling upon their open eyes. The expressive counterpart is simply to use action-language: generally when we say that someone 'raised their arm and waved' we mean to report that their arm moved as a direct expression of their intention to move their arm. To cancel this implication of a directly-expressed mental state requires the addition of a specific term like 'unintentionally'.[11]

So while it is true that we do not have familiar, precise, general nouns for psychocoporeal processes, we do have a wealth of language for ascribing them to people. Indeed a great deal of our everyday mental talk functions to ascribe psychocorporeal processes to people, usually without making the boundary between mental and behavioural at all salient. Just as when we see a chair we do not generally pay attention to the distinctness of its different sides, or to which of them are concealed and which revealed, when we see a person grimacing in pain we do not generally pay attention to the distinctness of the pain and the grimace, or to which of them is concealed and which revealed: we see expressed-pain (a psychocorporeal process), a single thing which feels bad and is visible on the face.

Admittedly, much of this language is frustratingly inconstant, in that it can be used in some contexts for the psychocorporeal whole, for the mental state specifically, or for the behaviour specifically: 'she saw an eagle' can be a pure mental state description or a psychocorporeal description, and 'she nodded fearfully' can be a pure behavioural description or a psychocorporeal description. Thus my term 'psychocorporeal' is needed not so much to fill a gap in language, as simply to supply a precise term with a fixed meaning.

The Causal Co-Presentation view is compatible with many views on the metaphysics of mind. Rather than either occurrent or potential behaviour having to constitute mental states, mental states can be non-physical states of a physical substance, physical states of a physical substance, non-physical states of a non-physical substance, or something else. It is even compatible with realiser-state functionalism (though role-state functionalism may be better suited to Smith's version of the Co-Presentation view). It is easily combined with the extended mind thesis, but unlike Krueger's view it is not committed to it.

Moreover, the Causal Co-Presentation view allows for the reconciliation of perceptualism and inferentialism, through the central role of mental imagery. It can accommodate both the phenomenological immediacy that motivates perceptualism,

[11] On other occasions I think we talk about psychocorporeal processes just by using either bodily or mental terms, often more-or-less interchangeably. When one person says "I looked around the room and saw nothing but happiness", and another person says "I looked around the room and saw nothing but smiling faces", it seems to me that they may well be reporting the very same perceptual state, whose content is that each person in the room is 'smiling happily', i.e. is in the throes of a psychocorporeal process through which happiness is directly expressed by smiling.

and the epistemic distance that motivates inferentialism. In the next two sections, I will defend these two claims in turn.

3 Co-Presence, Imagination, and Imagery

I have claimed that the Causal Co-Presentation view is compatible with 'perceptualism'. I will support this by arguing that co-presentation in general is genuinely perceptual, both phenomenologically and psychologically. To defend this claim, I begin by outlining what I mean by phenomenologically and psychologically perceptual, and then introduce what I consider the best extant view of co-presentation, Nanay's (2010) imagery-based account. I show how the role of imagination in this account allows it to be perceptualist in my two senses, and how this can be extended to mind-perception by assigning sympathetic imagination the same role that sensory imagination plays on Nanay's model. The result is a view on which we understand another person's mind by imagining being that person, and on which sensory percepts co-present concealed aspects by being bound together with imaginings.

First, I will need to say something about the term 'imagination', which has both a broader and a narrower sense. In its broad sense it covers all the phenomena whereby the mind generates and employs 'off-line copies' of mental states, independent from their normal causes and effects. But in its narrower sense it means specifically an effortful, voluntary, conscious act; in this sense it would contrast with automatic or unconscious processes which generate and employ 'mental imagery', and which would count as 'imagination' only in the broader sense.[12] In this narrower sense it is clearly not the case that co-presentation relies on imagination: we do not constantly make an active effort to picture things from other angles when we perceive them. Nanay makes this point in distinguishing mental imagery from the effortful act of 'visualizing': though on his view we make constant, involuntary, use of mental imagery, this does not mean that we "visualize objects all the time" (Nanay 2010, p. 251). But he recognises that this is still in a broader sense a matter of imagination, as when he describes his view as a partial defence of the idea that "imagination is 'a necessary ingredient of perception itself'" (Nanay 2010, p. 240; quoting Strawson 1974, p. 54; himself defending Kant 1789). For clarity I will henceforth use the term 'mental imagery' in place of 'imagination', to make clear that it is a passive, automatic process that is under discussion.

So first, in calling some content 'phenomenologically perceptual' I mean simply that it is a matter of us experiencing things as right there, present in our environment, outside of our minds, *and* experiencing their presence as manifested to by some sort of sensory quality. Thus the contents of dreams and hallucinations can be phenomenologically perceptual, even if they are not properly perceptual in their

[12] It is not quite clear whether we should call such imagery 'unconscious', in cases like co-presentation where it makes a difference to the content of perceptual experience. But it is at least clear that we do not 'consciously create it' - the initiation of the process is unconscious, even if the results are not.

psychological origins. The second clause (presence being manifested qualitatively) is what ensures that when I know that someone is in the next room, even if I am so gripped with overwhelming fear or longing that I might be said to 'experience them as right there, on the other side of that wall', I should not be said to *perceive* them. I may begin to perceive them, phenomenologically speaking at least, when there are particular sounds or sights or smells that I experience as manifestations of them (whether rightly or wrongly) but not simply when I am vividly convinced of their proximity.

Next, in calling some process 'psychologically perceptual' (or 'having the psychological role of perception) I mean that it is informationally sensitive to the actual state of the environment more than anything else, and tends, when incoming information from the environment conflicts with belief, to side with the former. Here 'informationally sensitive' means that the process is not only caused by environmental factors (like a headache that correlates perfectly with humidity), but transmits information about the environment for other psychological systems to use. The idea that perception sides with incoming information over belief simply amounts to the claim that we can perceive things a certain way even when we do not believe them to be that way—either falsely (as in illusions which we know to be illusory) or truly (as when we persist in our errors despite seeing the truth with our own eyes). But of course this claim can only be a 'tends to', because background beliefs do exert some influence on perception. Sometimes, when sensory information is ambiguous or incomplete, we see what we expect to see, or what we want to see. Moreover, it is likely not even possible to fully dissociate the contribution of incoming information from the contribution of background beliefs, simply because it is in part our background knowledge which tell us what incoming information means. Thus the criterion employed here is compatible with thinking that, for instance, when I have learnt to tell currawongs from magpie-larks by sight, the processing that goes into my representing something 'as a currawong' is a psychologically perceptual process (cf. Siegel 2006, 2010) even if it is based on beliefs about what currawongs look like—after all, it supports the possibility of something looking like a currawong even if I know it's not one.

Nanay's imagery-based account of co-presentation makes it perceptual in both of these senses. He argues that understanding co-presentation (which he calls 'amodal perception') as mental imagery is preferable to any of the other ways philosophers and psychologists have proposed (e.g. Clarke 1965; Michotte et al. 1991; Gibson 1972; Noë 2005; cf. Briscoe 2011). The idea is that we generate imagery—that is, 'quasi-sensory' experiences largely divorced from the normal causal role of sensation[13]—at the same time as receiving sensory inputs, based both on those inputs and on our background knowledge, and we project that imagery into the egocentric space of perception and bind it with percepts.[14]

[13] By 'largely divorced from the normal cause role of sensation' I mean that in general mental imagery neither requires stimulation of the sense-organs, nor tends automatically to give rise to beliefs that the world matches its content.

[14] A further, natural, extension would be to think that the phenomenological unity between this imagery and particular sensations results from a process akin to the 'feature binding' that connects different sensations when they are perceived as belonging to the same object (cf. Treisman and Gelade 1980,

Nanay's account of co-presentation best accounts for co-presentation's phenomenology, neurology, and for the possibility of co-presentational illusions. We can bring this out by contrasting it with three rival views that Nanay considers: that co-presentation is simply a matter of belief, that it is simply a matter of available actions, and that it is simply a matter of sensory input.

Consider first the view that co-presentation is simply a matter of belief: we perceive the revealed aspects of things, and then form beliefs regarding their concealed aspects. If co-presentation were simply a matter of belief, then the Causal Co-Presentation view would not be a form of perceptualism, since beliefs are neither phenomenologically nor psychologically perceptual. But in fact this view of co-presentation is implausible. For a start it misrepresents the phenomenology of co-presentation, which is clearly phenomenologically perceptual, involving the experience of something's being present outside me (Nanay 2010, pp. 241, 252). Relatedly, the belief-based account fits uneasily with evidence suggesting that early visual areas respond directly to modally completed ('illusory') contours, which are likely to be neurologically similar to occluded (and hence co-presented) contours (Kellman and Shipley 1991; Lee and Nguyen 2001).

A more specifically psychological objection to the belief-based account (Nanay 2010, pp. 243–244) is that it makes co-presentation too sensitive to background beliefs, and thus predicts the impossibility of co-presentational illusions, recognised as such. Yet such illusions are clearly possible, for example with paintings that give an illusion of depth, so that there seem to be hidden sides even when we know there are not, or with stage facades which we see as buildings despite knowing them to be flat behind (Smith 2010, pp. 736–737, notes this fact in setting up his version of the Co-Presentation view of mind-perception). If the belief-based account were right, there should be no co-presentation in these cases, and yet the experience of co-presentation persists.

Of course, background knowledge *can* affect what is co-presented. Someone who has no experience with houses will not see facades of houses the same way as someone who is familiar with houses: the facades will not co-present the same kind of square, solid, backs. And someone who is familiar with houses but knows the facades to be facades may eventually come to see them simply as facades, giving no illusion of depth: they may even by an act of will force themselves to see it just as a facade, perhaps by staring at it while visualising the flat and flimsy back they know it to have. But this does not happen automatically just from a change in beliefs. This limited top-down control is best accounted for by a mechanism which, through potentially driven by beliefs, is not simply a matter of belief: the construction and projection of mental imagery fits this bill.

Secondly, what about Noë's (2005) access-based view? On this view the perceptual presence of the co-presented consists in our being able to perceive them if we take certain actions. This would effectively rule out the Causal Co-

Footnote 14 continued
Duncan and Humphreys 1989, 1992, Treisman and Sato 1990).The mechanism that binds together the colour and shape I perceive in an object's front side is very similar to, and perhaps just a different application of, the mechanism that binds that percept with my subconscious visual image of the object's rear side. That is why in both cases I have a sense of them as aspects of a single object.

Presentation view, since it would then have the absurd result that our perceiving others' mental states consists in our being able to become those others if we take certain actions. But again this is not a plausible account of co-presentation. One big problem is that often we are able to perceive things which are not in any way co-presented (e.g. by walking to the next room). A contrasting problem is that things are often co-presented which we necessarily cannot reveal, such as the occluded portions of 2-dimensional figures.

Thirdly, Nanay considers the view that co-presentation is "straightforward[ly]… perceptual" (2010, p. 242). Here things are complicated, because Nanay's stated reason for rejecting this view is simply that there is no stimulation of the sense-organs corresponding directly to the co-presented aspects.[15] And of course in a sufficiently narrow sense nothing can be 'perceived' of an object except the features of it which transmit energy to the sense-organs. But in my above sense of 'psychologically perceptual', perception is richer than a mere recreation of what falls on the retina or other sense-organs: it is the information-stream that flows through those organs. And in this sense the imagery-based view qualifies as a perceptual view, for precisely the above reasons that count against the belief-based view. The imagery-based view makes co-presentation phenomenologically immediate and resistant to background beliefs in a way that allows for persistent illusions: this provides a sense in which co-presentation is a matter of perception. And we *should* understand 'perception' in this broader sense, because if we subtracted all the contributions of co-presentation, together with everything due to background knowledge, anticipations of the next moment, memories of the last, and anything else that goes beyond just what is associated with retinal irradiation, the resultant 'perception' would not deserve the name. It would be a ragged-edged and awkward fragment of our overall experience, not a natural or salient division.[16] (Indeed, Nanay's above-quoted remark about 'perception infused with imagination' suggests that he recognises this broader sense of perception.) So in denying that co-presentation is a 'purely' perceptual phenomenon, we need not deny that it is part of the richer phenomenon that best deserves the label 'perceptual experience'.

One attraction of the imagery-based account of co-presentation is its nuanced handling of the possibility of illusions. And one attraction of the Co-Presentation view is how nicely that handling of illusion seems to extend to mind-perception. In Sect. 1 I noted the possibility that someone's phoney happiness may be so convincing that I perceive them as happy even while knowing that they are not. A non-deceitful version of the same phenomenon occurs with actors, whose aim is

[15] More precisely, Nanay says that "If I receive no sensory stimulation from an object, then I can't perceive it." (2010, p.242) But of course the import of this depends on what we count as an 'object': in co-presentation we receive sensory stimulation from a whole object, and thereby perceive *it*, and in being aware of it *as* something with concealed aspects we are made aware of the presence of its concealed aspects through the sensory qualities of its revealed aspects, and to that extent 'perceive' the concealed aspects.

[16] Indeed, the narrow understanding of perception might not even have a referent: perhaps there is no single element of experience that depends solely and strictly on sense-organ stimulation, but only a pattern of similarities among many possible richer experiences. That is, they may be no determinate answer to 'what would I be experiencing right now if I ceased to project imagery, ceased to compare and categorise, etc.?'.

precisely to cultivate such an 'illusion' in spite of the viewers' knowledge that their actual mental states are very different from those of their characters.

The flipside of this is that beliefs can and do play important roles in mind-perception. For example, often I cannot discern someone's freely expressed emotion if I lack background knowledge of their culture or personality. This tells against any 'narrow' perception view, on which we perceive revealed and concealed aspects in the same sense. Moreover, in all these cases (active deception, acting, and sincere but opaque expressions) I can become able, with enough practice, learning, or mental effort, to voluntarily shift between the two perceptions. For instance, I can often manage to perceive an actor as having all the mental states of the character they portray, then shift back to seeing them as having intentions like 'make money by acting out this script',[17] then shift back again at will, just as we can with ambiguous figures like the duck-rabbit.

So mind-perception seems to behave the way that the Causal Co-Presentation view, combined with the imagery-based account of co-presentation, would predict. The natural way to make sense of this is an 'imagery-based' account of mind-perception, combined with the independently attractive 'simulation theory' of mind-reading in general. According to simulation theory, we 'put ourselves in the other's shoes', modelling their mental processes by running our own in an 'off-line' mode cut off from their normal inputs and outputs. Although many authors defend 'hybrid' theories on which the brain employs both simulationist and non-simulationist processes (e.g. Nichols and Stich 2003; Goldman 2008; Nanay 2014; cf. Gordon 1996; cf. Nanay 2014), there is good evidence that simulation plays at least a major role. For example, subjects with impairments in feeling a certain emotion also show impairments in recognising it in others (e.g. Adolphs et al. 1994; Lawrence et al. 2002); subjects who believe something tend to act as if others will believe it, even with evidence that they do not (e.g. Camerer et al. 1989); and numerous correlations exist between brain systems involved in thinking about others and those involved in thinking about ourselves (e.g. Iacoboni et al. 2005; Mitchell et al. 2005).

Suppose, then, that mind-perception involves simulation. This requires that recognition of a behaviour pattern induces an internal simulation of the mental state which might result from, or lead to, that pattern. The latter stage involves 'offline' copies of other mental states, divorced from their normal causal roles, and thus might be called 'imagery', albeit under the heading of 'sympathetic' rather than 'sensory' imagination (Nagel 1974, fn11). This kind of 'sympathetic imagery'—passive, involuntary, even unconscious processes of simulating other people's mental states—are already appealed to in simulation theory, under the label 'low-level simulations'. Just as everyday co-presentation involves projecting sensory imagery into perceptual space and binding it to a perceived object, mind-perception involves projecting low-level simulations into perceptual space and binding them to

[17] There are of course other aspects to what is going on when watching an actor, not least that generally there are two subjects to whom we ascribe the real and the apparent mental states - the actor and 'the character' (whatever the ontological status of the latter). But the mind-perception shift I am describing is independent of this, as we see when we consider actors playing themselves but still acting.

perceived expressions and impressions so as to form an integrated perceptual representation of a psychocorporeal process.

Note that because such low-level simulation are bound so closely together with the percepts that prompt them, and can give rise to robust illusions, we should regard them as parts of perception rather than viewing them as a separate, purely cognitive, layer. In this sense the Causal Co-Presentation view attempts a rapprochement not just between perceptualism and inferentialism, but between perceptualism and simulation-theory, which many perceptualists have seen as opposed to their views (see, e.g., Gallagher 2008, p. 164). It is strictly true that we perceive the bodily processes and simulate the mental processes, but the two are bound in such a way that our immediate phenomenological impression is of a psychocorporeal process (e.g. a happy smile, an angry voice, an intentional action, a painful collision). For the perceiver's perspective either component by itself would be partial abstractions from the psychocorporeal process, just like the sides of a 3D object.

So in sum: mind-perception, like co-presentation generally, relies on 'imagination', at least in its broader sense: sensory imagination for standard co-presentation, sympathetic imagination for mind-perception. And because it involves automatically produced imagery, bound together with perceptions to yield both phenomenological presence and the possibility of robust illusions, it deserves to be called 'perceptual'. In the next section I will argue that it nevertheless also deserves to be called 'inferential'.

4 Co-Presence and Inference

I have claimed that the Causal Co-Presentation view is compatible with 'inferentialism'. In Sect. 1 I glossed 'inference' as 'applying a rational principle that is also employed generally in reasoning'—that is, to be inferential is to be continuous with our general procedures of reasoning. More specifically, I claim that mind-perception is both psychologically and epistemologically inferential, though in virtue of different stages of the process. When we acquire perceptual knowledge of other minds, we form a 'perceptual belief', i.e. a belief whose content is simply the content of (some part of) our perceptual experience. That perceptual experience comprises both presentations and co-presentations, the former corresponding to some stimulation of the sense-organs, the latter formed by the projection and binding of mental imagery. Though these arise simultaneously (we are not first conscious of one, and then of the other), there is an asymmetric dependence between them: co-presentations are constructed by the brain largely on the basis of presentations. I claim that this construction of co-presentations is psychologically inferential, in a way that makes the step from perception to belief epistemologically inferential. I will explain these two claims in turn.

First, what does it mean to be psychologically inferential? A necessary condition is rough conformity to some rules of good reasoning, and co-presentation seems clearly to satisfy this condition: generally when something co-presents another thing, it provides evidence for it (seeing the front side of a cup is good evidence that

there is a cup-like rear side behind it). But it is not sufficient that there be some information-processing that conforms to a valid principle, for this is true of almost all mental processes. For instance, the perceptual system might be loosely said to 'infer' the location of a sound-source from certain 'premises', namely the difference between the sound-stimulus received by each ear; similarly, binocular vision seems to involve drawing 'conclusions' (depth experiences) from 'premises' (binocular disparities). But we would not say that the subject themselves infers any of this: they simply hear the sound as coming from a particular place, or see something as having a certain depth. If this was the only way mind-perception was psychologically inferential, it would not be very interesting.

But mind-perception is different from the above examples, because not only the 'conclusion' but also the 'premises', and the relation between the two, are potentially available to consciousness. With things like the auditory perception of location, we experience the result of the process but have no access to (let alone control over) the process itself or its inputs. Since we have no insight and no agency, it would be inappropriate to say that we are the ones drawing the inference. But when I see two discontinuous portions of brown wood as being merely the revealed aspect of a single continuous table that is partially occluded, matters are different: as well as experiencing the output (co-presentation of the table's concealed part) I also experience the input (presentation of the two revealed parts), and I experience the relevance of one to the other (it is those table-parts which co-present the other table-part, not some other item). This access by the subject lets us ascribe the process to to the subject themselves.

Of course this access is not perfect, especially in complex cases like mind-perception. If we ask someone what it is that makes someone else seem angry, they may not at first know what to say. They might say 'I don't know, they just seem angry'. But they also might say 'Their brow is furrowed, their eyes are narrowed, their movements are quick and forceful' etc. The question is how these two answers relate. The inferentialist claim is that the latter is a successful articulation of the former, unpacking what was really going on when the person 'just seemed angry'. It shows a clearer, more explicit, grasp on the internal structure of the original perceptual content. Evidence in favour of this claim is that someone who first answers 'I don't know, they just seem angry' could be asked to work harder, and might well say things like 'well, it was something about the way they were moving…' or 'it was something about the way they were talking…', and then to reflect harder on that particular feature, progressively zooming in on the relevant factors: the initial inarticulate grasp can guide their attention in particular directions. This process is not possible for things like place-hearing.

A related reason why the inferential processes at work in co-presentation can be meaningfully attributed to the subject is that they have some voluntary control over them. This control is similar to the control we have with bi-stable images like the duck-rabbit or the Necker cube: we can force ourselves to see the image in one way, or in the other way, as we please. Similarly we can, either on a whim or to make our perceptions match our beliefs, 'tell ourselves' that something we are looking at has a different rear side or mental life than it actually seems to have, and make an effort to see it as such. This effort may fail, but we can make it, in a way that we cannot make

an effort to see a red thing as blue, or to hear a sound as coming from a different direction.

Thus I conclude that co-presentation is a psychologically inferential process, because (1) it conforms to rational principles, and (2) the subject has sufficient access to and control over it for us to ascribe it to them. But co-presentation is not itself epistemologically inferential: indeed, co-presentation, being perceptual, is not even something that we can hold someone epistemologically accountable for. There is nothing unreasonable in the sort of pretence discussed in the previous paragraph, of actively seeing something as having concealed aspects we know it does not have. It is just like deliberately seeking out visual illusions to look at: there is nothing unreasonable in making our perceptual experiences inaccurate or even incoherent. All that can be unreasonable is the beliefs we form as a result.

I claim that the formation of perceptual beliefs about co-presented aspects is an epistemologically inferential process. By this I mean that the justification or warrant for forming these beliefs is conditional on their conformity to rational principles: if we experience a mental state as co-present but have no good evidence for its existence, we should withhold belief in it. Of course, since the construction of co-presentations is psychologically inferential, we are usually justified in accepting what is co-presented to us. But there will be exceptions—the systems which construct co-presentations are fallible, prone to human biases and blindspots, and when they misfire we are unjustified in believing them.

This differentiates perceptual beliefs based on co-presentation from perceptual beliefs not based on psychologically inferential processes. If something looks blue to me, that is all by itself justification for believing it blue. Of course I may have countervailing evidence, like background beliefs to the effect that I am in a strangely-lit room where blue objects do not look blue. But the fact that perceptual justification can be overridden does not make it conditional, and the fact that believing my perceptual processes to be unreliable can defeat my justification does not show that I must positively believe in their reliability in order to get that justification. Indeed, it is implausible to say that justification requires such a positive belief, because beliefs about reliability are second-order beliefs about beliefs, requiring a grasp on the notion of a perceptual process, and it seems unlikely that we must first form second-order beliefs to get justification for our first-order beliefs. By contrast, the justifying inferences involved in co-presentation can involve entirely first-order premises.[18]

To see the conditionality of our justification for believing in what is co-presented, suppose I see a table, and it just seems to me that it has unseen spikes on its underside. Unless I have some support for this conclusion, I should not believe that there are spikes. This is a sort of hallucination, with the peculiarity of being detectable as such just by reflection. Even if I cannot help it seeming to me that there are spikes there, I can ask myself what evidence there is for such spikes, and

[18] This point about co-presentation holds even though mind-perception, in particular, seems by its nature to require something like representations of representations. There may be forms of rudimentary mind-perception that do not involve second-order representations, but their content is tricky to spell out. See Wimmer and Perner 1983, Roessler 2005, Campbell 2005, Call and Tomasello 2005.

realise that the presented sides support no good inference to there being spikes on the other side.

Mind-perception is just the same. We might fall prey to wishful thinking, seeing someone clearly uncomfortable as genuinely happy because we prefer them to be. We might be influenced by biases, and see someone's neutral expression as hostile because of their gender or ethnic group. We might be pathologically deluded, seeing clearly animate people as mindless automata, or unfailingly friendly people as malevolent enemies. Even if we genuinely do perceive people in these ways, surely we have no good reason to believe that they are the way they seem. Justification for forming such beliefs must be earned by the reasonableness of the inferences that generate the relevant perceptions.

Thus we can retain the traditional inferentialist thought that something like an argument by analogy, or argument to the best explanation, is both psychologically responsible for, and essential to justifying, knowledge of other minds. Adding that these inferences can be incorporated, through low-level simulations, into the content of perception, need not stop them counting as both psychologically and epistemologically inferential.

5 Conclusions

The Causal Co-Presentation views is perceptualist: the minded character of other people is as much a part of the content of perception as is the three-dimensional nature of seen objects. It is also inferentialist: co-presentations of mentality are produced by a rational process which can be ascribed to the agent themselves, and justify belief only if that process is good. In this way, the view has advantages over more one-sided rivals on both sides: it respects the immediacy of mind-perception better than rival forms of inferentialism, and respects the privacy of experience between than rival forms of perceptualism. On this view, 'imagining' what it would be like to be the other person plays the same role as 'imagining' what an object would look like if we rotated it or walked around it. When an object's front co-presents its back, we form imagery of what it would be like to see the back; when a person's behaviour co-presents their mental states, we form 'imagery' (low-level simulations) of what it would be like to be them. Even if the latter counterfactual is impossible, the psychological role played is the same.

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