Seeing mind in action

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Abstract Much recent work on social cognition and empathy in philosophy of mind and cognitive science has been guided by the assumption that minds are composed of intracranial phenomena, perceptually inaccessible and thus unobservable to everyone but their owners. I challenge this claim. I defend the view that at least some mental states and processes—or at least some parts of some mental states and processes—are at times visible, capable of being directly perceived by others. I further argue that, despite its initial implausibility, this view receives robust support from several strands of empirical research.

Keywords Phenomenology · Philosophy of mind · Social cognition · Empathy · Distributed cognition · Extended mind

Introduction

There is a fundamental, if generally unexpressed, presupposition behind much current social cognition research. Call this the "unobservability principle" (UP): the idea that minds are composed of exclusively intracranial phenomena, perceptually inaccessible and thus unobservable to everyone but their owner.[1] UP is not just a

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[1]For example, Alan Leslie writes that "One of the most important powers of the human mind is to conceive of and think about itself and other minds. Because the mental states of others (and indeed ourselves) are completely hidden from the senses, they can only ever be inferred" (Leslie 2004, p. 164). In a recent handbook of social psychology, Nicholas Epley and Adam Waytz write that "[p]eople do not have direct information about others' mental states and must therefore base their inferences on whatever information about others' mental states they do have access to. This requires a leap from observable behavior to unobservable mental states that is so common and routine that people often seem unaware that they are making a leap" (Epley and Waytz 2009, p. 499). Epley and Waytz fail to even consider the possibility that the reason people are often unaware of making an inferential "leap" of the sort they describe is not due to the habitual nature of the process but rather the fact that, very often, there is no leap being made in the first place.

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contemporary idea. It motivates the classical philosophical problem of other minds: the *epistemological* question of how, given this absence of the very possibility of perceptual verification, I can nevertheless be justified in believing in the existence of other minds. Additionally, UP motivates recent attempts in cognitive science to answer the *empirical* problem of other minds: the question of what sort of mechanisms enable me to attribute minds to others given this basic inability to perceive them.

Ongoing discussions of social cognition and empathy in philosophy of mind and cognitive science represent various attempts to tackle the empirical problem of other minds. Within this literature, social cognition is generally framed as a kind of "mindreading" or basic ability to detect and respond to another's unobservable mental states (beliefs, desires, intentions, emotions, etc.). For several decades, this mindreading ability was said to depend upon extra-perceptual cognitive mechanisms: the early development of a quasi-scientific theory of mind (Baron-Cohen 1995; Gopnik and Wellman 1992) or, alternatively, the use of our own mental states to imaginatively simulate what another person is likely thinking and feeling (Dokic and Proust 2002; Goldman 2006; Gordon 1996). These two approaches, "Theory Theory" and "Simulation Theory," were generally taken to be the two most viable solutions to the empirical problem of other minds. Both offer characterizations of the mechanisms enabling us to move from observable behavior to unobservable mental states.

Recently, however, an alternative phenomenologically motived account of social cognition has emerged (Gallagher 2008; Gallagher and Hutto 2008; Gallagher and Zahavi 2008; see also Hobson 2008; Reddy 2008; Ratcliffe 2006). This "direct perception" (DP) account of social cognition argues that, quite often, we have direct perceptual access to aspects of another's mentality. At its core, social cognition thus need not be a process that relies upon extra-perceptual cognitive mechanisms. Rather, we somehow directly *see* another's mental life, including their thoughts, emotions, intentions, etc., within our perception of their expressive behavior. DP thus appears to deny UP. In so doing, it challenges both Simulation Theory and Theory Theory. Within this literature, DP is often framed as a kind of empathy—an experientially direct person-to-person access—that underwrites more sophisticated higher-order forms of mindreading including theorizing and imaginative simulation (see Thompson 2001; Zahavi 2010).[2]

This paper has two primary aims. First, I consider two strategies for defending DP and rejecting UP. These strategies rest on alternative ways of understanding how it is

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[2] Within the empathy literature, there are multiple and often conflicting definitions of empathy at play—a problem which complicates any appraisal of competing approaches. Daniel Batson observes that "[t]he term *empathy* is currently applied to more than a half-dozen phenomena," and that "each is a conceptually distinct, stand-alone psychological state" (Batson 2009, p. 3). Additionally, the concepts of "sympathy" (feeling *with* another's suffering and desiring to alleviate it) and "empathy" (comprehension *of* another's experience) are often run together, furthering confusion (Wispé 1986). Finally, even within the ranks of DP defenders there is disagreement over how the term empathy ought to be used. For instance, Dan Zahavi (following phenomenological orthodoxy) seems to equate empathy and DP (Zahavi 2008, 2010) whereas Shaun Gallagher wants to reserve empathy for a higher-level, more developed understanding of an individual and their situation (Gallagher, personal communication). While these distinctions are interesting, I am not here concerned with definitional issues. Rather, I am concerned with the core DP thesis at the heart of phenomenologically motivated accounts of social cognition—and not, then, the question of whether or not "empathy" is the best term to use in accounting for this phenomenon.

that bodily behavior might be said to express mental phenomena. I argue for the superiority of one strategy over the other—one that adopts what I term a "constitutive" sense of bodily expression—and suggest that it ought to be explicitly adopted by defenders of DP. Second, I use this constitutive sense of expression to defend DP and reject UP. More precisely, I defend the view that some mental states and processes—or at least some *parts* of some mental states and processes—are at times visible, capable of being directly perceived by others. This is because some forms of expressive behavior constitute proper parts of some mental phenomena. We see mind in action. I support this claim by marshaling multiple strands of empirical research, in particular work on distributed or extended cognition. I also consider a number of objections to this view.

Empathy and direct social perception

Drawing upon phenomenological characterizations of empathy and intersubjectivity found in thinkers like Husserl, Stein, Scheler, and Merleau-Ponty, a number of contemporary theorists have recently defended DP. Expressing the core of this idea, Husserl writes that "we intuitively ascribe to the other person his lived experiencing, and we do this completely without mediation and without consciousness of any impressional or imaginative picturing" (Husserl 2006, p. 84)."[3]

According to DP advocates, perception of others is from the start structured with rich social information. This is because we have a direct perceptual grasp of another's intentions, feelings, etc. within the immediacy of their context-sensitive actions (Gallagher 2008, p. 535). This socially "smart" perception enables us to grasp what they're thinking and doing without the addition of some extra-perceptual cognitive mechanism (inferential theories, simulation routines, affective isomorphism, etc.). Accordingly, socially smart perception is *direct* in that the thoughts, feelings, intentions, motives, etc. of others are manifest in our experience of them such that we access them *immediately*. We see them without having to appeal to any sort of mediating "mindreading" mechanism (again, theories, simulations, etc.) beyond what is given directly in our perception of their behavior. Consequently, "in most of our encounters in everyday life, direct perception delivers sufficient information for understanding others" (Gallagher 2008, p. 540).

I will for the most part accept this portrayal of smart social perception.[4] But I suggest that it remains ambiguous at a crucial juncture and requires further clarification. Where does this ambiguity lie? In the way that "expression" tends to be deployed when describing how another's actions serve as our point of access to

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[3] Similarly, Merleau-Ponty insists that "We must abandon the fundamental prejudice according to which the psyche is that which is accessible only to myself and cannot be seen from the outside. My psyche is not a series of "states of consciousness" that are rigorously closed in on themselves and inaccessible to anyone but me. My consciousness is turned primarily toward the world, turned toward things; it is above all a relation to the world. The other's consciousness as well is chiefly a certain way of comporting himself toward the world. Thus it is in his conduct, in the manner in which the other deals with the world, that I will be able to discover his consciousness" (Merleau-Ponty 1964, pp. 116–117).

[4] For some critical appraisals of this view, see, for example, Goldman and de Vignemont (2009), Herschbach (2008), and Spaulding (2010).

their "inner" mental life. Following Max Scheler's characterization of our face-to-face encounter with another person as the encounter with a psycho-physical "expressive unity" (*Ausdruckseinheit*) (Scheler 1954, pp. 218, 261), DP defenders adopt a similar vocabulary. For example, we are told that "[e]xpression is more than simply a bridge that closes the gap between inner mental states and external bodily behavior. In seeing actions and expressive movements of other persons, one already sees their meaning. No inference to a hidden set of mental states is necessary. *Expressive behavior is saturated with the meaning of the mind; it reveals the mind to us*" (Gallagher and Zahavi 2008, p. 185, emphasis mine). While this formulation is helpful in emphasizing DP's denial of UP, it remains ambiguous.[5] This is because there are at least two relevant ways of understanding how the behavior of others can be directly expressive of their mental life. These different senses of expression point to two possible strategies for defending DP.

One strategy is to claim that in perceiving another's expressive behavior associated mental phenomena are experientially *co-present*. This view is motivated by the phenomenological observation that what we *experience* often outstrips what we *perceive*. For example, consider visually perceiving a solid opaque object. When I perceive a tomato, say, I see the part of the tomato that faces me. But I nevertheless seem to *experience* the whole tomato: the tomato as completed, that is, as a solid object in its three-dimensional density including both its front as well as its backside. I don't experience mere aspects of the tomato. Although the tomato is perceptually present from a particular perspective—and therefore the tomato is strictly speaking *seen* or *perceived* aspectually, as presenting only part of itself relative to my spatial position—it is nevertheless *experienced* in its totality as a solid three-dimensional object. This is a fact about the phenomenology of perceptual consciousness. Hidden parts of the tomato (as with other solid opaque objects) are in this way *amodally* co-present to perceptual consciousness.[6] Hidden parts are experientially co-present alongside visible parts even if they remain perceptually absent. Analogously, although we only ever *perceive* another's behavior (a frown or smile), we

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[5] In a similar vein, Scheler writes that, "Our immediate perceptions of our fellow-men do not relate to their bodies (unless we happen to be engaged in a medical examination), nor yet to their 'selves' or 'souls'. What we perceive are *integral wholes*, whose intuitive content is not immediately resolved in terms of external or internal perception" (Scheler 1954, p. 261). Likewise, John McDowell (following Wittgenstein) endorses a similar (dis)solution to the problem of other minds, one which involves rejecting the distinction between bodily behavior and inner mental states. McDowell argues that when we perceive others, we perceive integrated *human beings*—and not mere behavior—including, then, facts about their mental life (McDowell 1998, p. 384). However, since McDowell's analysis is concerned with the epistemic warrant provided by perceptual experience more generally (i.e., not simply our experience of others), his account remains underdeveloped on this point and thus also harbors a similar ambiguity.

[6] Amodal perception is the experience of objects as completed when they are partially occluded. The completed content is amodally given to perceptual consciousness since the visually occluded content (the backside or parts of objects occluded by other objects) is nevertheless experientially present (Durgin et al. 1995). Husserl puts the point this way: "there belongs to every external perception its reference from the "genuinely perceived" sides of the object of perception to the sides "also meant"—not yet perceived, but only anticipated and, at first, with a non-intuitional emptiness (as the sides that are "coming" now perceptually)… Furthermore, the perception has horizons made up of other possibilities of perception, as perceptions that we *could* have… if, for example, we turned our eyes that way instead of this, or if we were to step forward or to one side, and so forth" (Husserl 1960, p. 44). A similar idea motivates Noë's sensorimotor account of perceptual consciousness, where the experience of amodal content consists in our knowledge of the sensory effects of movement in relation to the occluded object (Noë 2004, 2009).

nevertheless *experience* associated mental phenomena (their misery or happiness) as amodally co-present within their behavior. In other words, "[j]ust as the rear aspect of the book is visually present without being visually presented, so another's misery is visually present even though only their frown is visually presented" (Smith 2010, p. 739). Mental phenomena thus remain unobservable in the same way as the backside of a tomato. Nevertheless, they are experientially accessible via the perception of behavior. Framed thusly, this view is consistent with DP's insistence that we enjoy some kind of experiential access to another's mentality.

However, there are some challenges one might levy at this view. For example, Husserl notes that perceiving another's mentality is not analogous to experiencing the backside of three-dimensional opaque objects like tables and tomatoes. With this latter experience, I can move my head, body, or change my entire position by walking around the object until the occluded side is perceived directly. Experiences "of this sort involves the possibility of verification by a corresponding fulfilling presentation (the back becomes front)" (Husserl 1960, p. 109). But clearly this is not the case with another's mentality. Peering more closely, moving around, or manipulating another's head will never bring their mentality into direct view—at least not in a way analogous to co-present aspects of solid opaque objects. This sort of perceptual "verification must be excluded a priori" (Husserl 1960, p. 109). So, the mentality of another can never be anything more than amodally co-present within expressive behavior. Given this conclusion, it's not clear that DP advocates want to endorse this view since it seems to contradict the directness of our perceptual access to another's mental life. Our amodal experience of their (co-presented) mentality is phenomenally degraded with respect to our direct perception of their (presented) behavior.

Joel Smith, who defends a similar view, notes this objection. Drawing upon Husserl, he responds by arguing that my perception of another's mentality can be fulfilled by "the co-presented and presented taking part in a harmonious experience" (Smith 2010, p. 741). In other words, I can experience another's anger, say, by perceiving ongoing patterns of behavior that continually confirm this anger: their scowling and fist-shaking, speaking loudly, etc. So, co-presented mentality is not confirmed in presentations of the mental as such but in temporally extended presentations of another's "changing but incessantly *harmonious behavior*" (Husserl 1960, p. 114; quoted in Smith 2010, p. 741). In perceiving another's behavior, I anticipate further behavior in which their mental states will be co-presented; these perceptual anticipations are confirmed when they "latch onto" or match the functional or dispositional role of another's mental states (their role in disposing them toward certain behavior), ensuring that I see another as instantiating specific mental properties (Smith 2010, p. 741).

To capture this idea, Smith offers the following "general principle L":

> L: For any object O and functional property F, if the perceptual anticipations in one's perception of O 'latch onto' the functional role definitive of F, then one perceives O as being F. (Smith 2010, p. 741).

This account, Smith claims, allows us to see how perception can put us in touch with functional properties of objects (e.g., mental properties of others) that are both temporally and modally extended. To see another as angry is to see aspects of anger

both *presented* (manifest behavior of a certain sort) and *co-presented* (dispositions to behave in certain ways). Both of these aspects are part of the functional profile of anger; and both are thus part of, or at least can be part of, the content of perceptual experience. At least on some occasions we therefore "see others as *persons*, possessing both mental and physical properties" (Smith 2010, p. 742).

While an attractive suggestion, this response remains problematic from the perspective of DP.[7] First, by adopting the metaphor of co-presence to describe the way that mental phenomena reveal themselves, this view reaffirms that what I really see in others are bodily features and not genuine features of their mentality. The latter continue to be unobservable no matter how "harmoniously" they integrate with behavior. Admittedly, I may not perceive "*mere* behavior" (Smith 2010, p. 742)—I may perceive certain patterns of behavior as saturated with the meaning of the mind and thus experience this behavior as reflecting the intentions and emotions of a minded creature—but I nevertheless really only *see* James' flushed cheeks, contorted facial expressions, and shaking fists, the way that I really only *see* the side of the tomato facing me. Harmonious patterns of behavior do not render mental properties legitimately observable. This is because it is not at all clear that dispositional properties can be seen. Dispositions are inherently modal notions. And we don't see modalities (McGinn 1996). We do not see, for example, solubility or a disposition to be soluble. We see *that* something is soluble by watching it dissolve. We see what actually obtains: "our eyes do not respond to *woulds* and *might have beens*. Dispositions depart too far from the actual world to be objects of simple sight" (McGinn 1996, p. 540). According to Smith's view, what is strictly visually presented is behavior. Mentality, under a dispositional description, is experientially present but visually absent; it is phenomenally degraded in how it reveals itself to us. This is the force of the presence/co-presence distinction. So, as co-presented dispositional properties, mental properties lie outside the scope of visual content.[8] They are amodally co-present—*essentially* so (Smith 2010, p. 743)—and thus remain a half-step removed from direct perceptual reach. Even if patterns of harmonious behavior are seen as instantiating co-present mental properties, seeing *that* behavior is instantiating mental properties—like seeing *that* a dissolving solid is instantiating solubility or *that* a tomato has a backside—is not equivalent to seeing the property of mentality (or solubility or having a backside)itself. Transposed onto the discussion of seeing other minds, the presence/co-presence distinction appears to tacitly affirm UP.

Second, in light of the above, it's not clear that this view offers a significant advance over standard inferentialist theories. Smith is quick to point out that his account is not a behaviorist theory (Smith 2010, p. 743). Mental properties are not reducible to behavioral properties. Rather, it is only when I harbor the right sort of perceptual anticipations that I see patterns of behavioral properties as confirming the

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[7] Note that I am not yet arguing that DP is *correct* in its portrayal of how we see other minds. For now, I am simply showing why in virtue of its stated aims DP ought to reject the co-presence thesis.

[8] But see Stout (2011) for an argument that we can become perceptually sensitive to dispositions by interacting with them—that is, by engaging with others and participating in a joint process of emotional expression.

co-presence of mental properties. But as we've seen, to directly see behavior is still not to directly see mentality. I require the possession of an extra-perceptual connecting state to take me from the former to the latter—much like when I look at the fuel gauge and see that the fuel tank is half empty.[9] In other words, I need to be in possession of an additional state that confirms that the behavior I see *really is* instantiating mental properties. I see something suggesting *that* anger is being instantiated; but again, seeing an instantiation of a property is not the same as seeing the property itself. I need further justification.

How do I get it? When I need confirmation that the tomato I see has a backside, I simply tilt my head or move around it to the other side until the back becomes front. No connecting state is needed. But this option is not available to me in the case of mental properties in virtue of their essentially dispositional, co-present character (Smith 2010, p. 744). This is where the analogy with perceiving opaque objects breaks down. Since it's unclear that dispositions really can be part of the content of visual experience, I need something more than merely seeing bodily features. This connecting state need not be discursive in the sense that I need not consciously infer that since I see behavior, I must also be experiencing mental properties; the required inferences are epistemic, not psychological (McNeill 2011, p. 8).The point is simply that, while my knowledge of another's anger (for example) might be perceptual it is, nevertheless, inferential. Since I cannot directly reach mentality directly via perception, according to this view, I require the mediation of a warranted connecting state to help me get there.

So, even when I harbor the appropriate perceptual anticipations and see behavior as confirming the co-presence of the mental, there remains a qualitative difference in terms of how another's physical and mental properties are experientially presented. The latter, in contrast to the former, are given with an indeterminacy that makes them only indirectly (co-)present, just like the occluded backsides of tomatoes.[10] And this appears to contradict DP's proposal that we at least at times enjoy direct noninferential access to aspects of another's mental life within their expressive behavior. Accordingly, while Smith's view remains an intriguing suggestion, this approach doesn't appear to have made a significant advance over orthodox inferentialist pictures of social cognition according to which other's mental states are unobservable.

A second strategy for defending DP is to speak of "expression" not in terms of co-presence but rather constitution. Taking expression in a constitutive sense involves the idea that certain bodily actions are expressive of mental phenomena in that they actually constitute proper parts of some mental phenomena. In other words, some mental phenomena have a hybrid structure. They are states or processes[11] that

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[9] See Dretske's (1969) distinction between primary and secondary epistemic seeing. See McNeill 2011.

[10] Smith concedes this point but argues that, given the complexity of our mental life and the various functional roles of different mental states, it is plausible that we can never perceptually "latch onto" the complete functional profile of an instantiated mental property and thus perceive this property *as* fully determinate. However, this is an intuitive result, Smith insists, since it leaves room for further discovery of another's exact state of mind (Smith 2010, p. 746). While it is certainly true that there is always room to discover further facts about another's mental life—the proposal I argue for certainly acknowledges this, as we'll see below—this response does not change the fact that, according to this line of argument, another's mental life remains in principle unobservable.

[11] In what follows, I use "mental states," "mental processes," "mental phenomena," etc. interchangeably.

straddle both internal (neural) and external (extra-neural, gross bodily) operations, and are thus directly embodied within some patterns of expressive behavior. Accordingly, when we perceive behavior and expressive actions, we—at least at times—perceive not expressions of dispositions but rather proper parts of mental phenomena. We literally see mind in action.

Which option do DP defenders embrace? Their language of directly perceiving another's mentality would seem to suggest the second strategy; however, they remain ambiguous on this point. To return to an earlier quote, we are told that "[e]xpressive behavior is saturated with the meaning of the mind; it reveals the mind to us" (Gallagher and Zahavi 2008, p. 185). But just as a towel can be saturated with water while still remaining distinct from it, so, too, can behavior be saturated with mentality while nevertheless remaining distinct from the mental phenomena it expresses (even if the latter are amodally co-present). Embracing the first option means that all we ever really perceive directly are *bodily features*, patterns of expressive behavior that betray or amodally co-present mental phenomena but which fail to give us the phenomena in a genuinely direct perceptual sense.

In sum, instead of adopting the co-presence sense of expression, I suggest that DP advocates ought to explicitly embrace the constitutive sense of expression. This is a fairly radical thesis, as we'll see below. But I argue that this sense of expression is what is required if we are to take seriously the idea that we do at times have direct perceptual access to another's mentality. It constitutes the most straightforward and empirically defensible objection to UP.[12]

Seeing mind in action

What evidence might support the claim that at least some mental states—or at least some proper *parts* of some mental states—are visible, capable of being directly perceived by others? This idea appears to receive robust support from several different strands of empirical research. In what follows, I survey some of this research and discuss its significance for understanding DP's rejection of UP. I conclude that there are compelling reasons to ultimately reject UP.

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[12] To be clear, it is not immediately clear that some of the phenomenologists mentioned *do not* already endorse some version of the constitution thesis. For example, one can assemble various passages in Merleau-Ponty (1964) that appear to endorse this thesis or something very close to it. Likewise, Gallagher's discussion of the cognitive function of gesture, for instance, anticipates some of the externalist points raised below (see, for example, Gallagher 2005, pp. 107–129). Zahavi (affirming a view he attributes to Scheler) argues that affective and emotional states are not simply qualities of subjective experience but are "expressed in bodily gestures and actions, and they thereby become visible to others" (Zahavi 2008, p. 518). My point, once more, is this: speaking of behavior as expressive of mentality requires that one disambiguate how "expression" is being used to avoid conflating various senses of the term. Within the phenomenological tradition, this has not always happened—hence, my attempt in this paper to do just this. Of course, there is an additional prescriptive dimension to my discussion since I suggest there is a sense of expression (the constitutive sense) that *ought* to be used in this context, independently of the exegetical question of whether or not other phenomenologists *have* in fact used it this way.

The hybrid mind in action

Distributed or extended models of cognition (Clark 2008; Hutchins 1995; Rowlands 2010) can help us get a grip on the idea that proper parts of some mental phenomena may in fact be visible. The basic idea behind distributed models of cognition is that actions involving the manipulation and transformation of environmental structures—using pen and paper to complete a mathematical algorithm (McClelland et al. 1986); accessing a notebook to reliably prompt recall (Clark and Chalmers 1998); strategically organizing the spatial configuration of our workspaces to reduce computational burden (Kirsh 1995; Scribner 1986)—have cognitive significance. They are practices of *informational off-loading*: creating and interacting with external information-bearing structures (gestures, artifacts, language, etc.) in a way that makes it easier to process task-specific information more efficiently (with greater speed and fewer errors) and effectively than if subjects were to rely mainly on internal computations (Kirsh 2010b, p. 443). By distributing part of the cognitive workload onto the environment, some mental phenomena may be said to have a hybrid structure: they straddle both internal (neural, psychological, and phenomenological) and external (gross bodily, environmental) processes that together form an integrated cognitive unity.

But this practice of informational off-loading need not extend into the environment. We can speak of a more modest *bodily externalism* without necessarily committing ourselves to a more radical *environment-involving* externalism.[13] For instance, gestural dynamics, as we will see below, shoulder some of the cognitive burden in various communicative and problem-solving contexts. They enhance the gesturer's ability both to think and communicate, favorably shifting the ratio of cognitive effort to computational accomplishment for both sender and receiver (Hutchins 2005). Additionally—and crucially for the purposes of the present discussion—the structures used for informational off-loading, including gestures and facial expressions, have a *social* benefit. As shared, publically accessible objects of thought and feeling they invite a common perceptual focus and afford mutual interaction (Kirsh 2010b; Goldin-Meadow 2003). They afford direct perceptual access to mind in action.

Consider some concrete examples of informational off-loading where the body's expressive capacities are summoned to do representational work. Dancers, for example, will often use gesture during rehearsals to mark or materially encode parts of a dance phrase such as a sequence of steps and positions. A specific hand gesture might represent a postural position within a dance sequence; the whole body might be used to physically execute a synoptic version of the entire phrase. This affords the opportunity to concretely see the shape, dynamics, emotion, and spatial elements of a phrase better than if the dancer were to employ a strategy of imaginatively simulating the same phrase (Kirsh 2010a, p. 2864). This marking strategy has a

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[13] Since I am arguing that we do, at times, directly perceive mental states within patterns of expressive behavior, I will focus on bodily externalism. For arguments that the space surrounding the body as well as some of the things in it can be appropriated as a cognitive resource—i.e., environmental externalism—see, for example, Clark (2008), Hutchins (1995), Kirsh (1995), Krueger (2011), Menary (2007), and Scribner (1986).

tripartite function: dancers use their body to materially represent aspects of phrases for *themselves* (reinforcing memory, enhancing perceptual scrutiny of spatial relations), for *others* (providing an external structure for another's attentional focus), and *jointly*—the latter offering the opportunity to refine coordination and timing. In this context, the body serves as an external structure enabling dancers to extrapolate a more vivid conception of the final target (the complete phrase as performed) than if they were to rely exclusively on more cognitively demanding mental simulation (Kirsh 2010a, p. 2868). A solitary inferential process is thereby transformed into a shared perception-based process.

The relation between gesture and cognition is another arena for informational off-loading. Gestures can both cement memory and assist in working through and explaining various problems. For example, we tend to gesture more when reasoning about some problem as opposed to describing a known solution. The harder a task is—or the more options we face when solving it—the more we gesture (Goldin-Meadow 2003, pp. 136–149).[14] But gestures do more than simply supplement verbal communication. They also appear to cement memory by allowing for multiple representational formats that further solidify recall. For instance, children who mimic an instructor's gestures representing a successful strategy for solving mathematical equivalence problems are more likely to learn the strategy (Cook and Goldin-Meadow 2006); gesturing during the learning of a new mathematical concept, instead of just speaking about it, assists concept retention (Cook et al. 2008); and early (prior to 14 months) and prodigious gesturing such as pointing plays a central role in later vocabulary development (Rowe et al. 2008). Even the physicality of doodling can enhance our ability to focus attention and process, parse, and recall information (Andrade 2010).

Gestures also assist in working through and explaining various mathematical problems by easing the required mental effort for accomplishing these tasks. Children and adults asked to explain their strategy for solving a math problem while simultaneously remembering a list of words or letters did better on the recall portion of the test (reciting the list) when they were allowed to gesture while explaining their problem-solving strategy (Goldin-Meadow et al. 2001). The subjects permitted to let their hands do the talking—that is, let their gestures materially represent features of their problem-solving strategy the way that dancers' hand gestures materially encode dance sequences—conserved cognitive resources during the explanation task and thereby freed up cognitive resources for the subsequent recall task.[15]

In addition to their cognitive benefit for the sender, gestures clearly have shared *social* cognitive significance. For instance, they drive group problem-solving and dynamically shape shared learning environments. Becvar et al. (2008) showed that gestures play a central role in the development of scientific theories of molecular models in biochemistry labs. They manipulate and transform the cognitive context by providing external, relatively stable visuo-spatial dynamics allowing for

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[14] Some individuals with congenital absence of limbs report the experience of gesturing. However, the phantoms are only reported to be active in contexts involving communicative, and not instrumental, actions (Brugger et al. 2000; Ramachandran and Blakeslee 1998). Additionally, congenitally blind speakers gesture both alone and when speaking to others—including others they also know to be blind (Iverson and Goldin-Meadow 1998, 2001).

[15] See Clark (2008, pp. 123–131) for related discussion.

representational formats not sufficiently available in other modalities such as speech, imaginative simulation, etc. This enables the content of the developing theory to be externally reformulated and made more explicit—and thus open to further intersubjective scrutiny and collaboration (Becvar et al. 2008; Kirsh 2010b). Rather than having to rely on internal or abstract representations, collaborators can work with the real-time material models of another's gestures. Again, this off-loading practice is a cognitive action. It transforms a resource-intensive process of imaginative simulation into a less-demanding process of perception, conserving cognitive resources for other aspects of the collaborative process.

What about affective processes? Other empirical evidence seems to suggest that some emotions and affects are likewise distributed throughout their bodily expression. For example, a recurrent theme in the narratives of those with Moebius syndrome, a form of congenital facial paralysis, is the sense of diminished emotional phenomenology somehow connected to their lack of facial expressiveness (Cole 2010). One individual says that

> I have a notion which has stayed with me over much of my life—that it is possible to live in your head, entirely in your head… I sort of think happy or I think sad, not really saying or recognizing, actually feeling happy or feeling sad… These feelings are there but they are probably reduced. I've often thought of myself as a spectator rather than a participant (Cole 1999, p. 308).

Another individual with Moebius reports that she learned to mimic gestures she observed while on holiday in Spain. This strategy brought about a corresponding intensification in the phenomenology of her emotional experience: "I do not think I had emotion as a child but now I have it. How did I get it? It was in Spain… The body language I had learnt and used at university could be exaggerated in Spain, using the whole body to express one's feelings" (Cole and Spalding 2009, p. 154). Other individuals with Moebius report adopting alternative strategies of embodied expression—prosody, gestures, and verbalization, along with energetic artistic activities such as painting, dancing, or playing the piano—to scaffold their emotional experience, recalibrate its phenomenal character, and facilitate social sharing of the emotion (Rives Bogart and Matsumoto 2010). Individuals who have suffered severe spinal cord injuries and thus lack the ability to bodily express emotions likewise report less intense feelings of high-arousal emotions like fear, anger, or sexual arousal (Chwalisz et al. 1988; Hohmann 1966; see also Laird 2007, pp. 74–76; Mack et al. 2005).

Another line of supporting work comes from studies indicating that the manipulation of expressive behavior produces a corresponding change in emotional phenomenology. The largest and most consistent body of evidence concerns facial expressions (Laird 2007, p. 23). Multiple studies have found that when subjects are induced to adopt a particular emotion-specific facial expression (grimacing, frowning, etc.) or posture, they report experiencing the corresponding emotion (disgust, anger, etc.) (Duclos and Laird 2001; Duclos et al. 1989; Edelman 1984; Flack et al. 1999; Kellerman and Laird 1982; for extensive review, see Laird and Bresler 1992; see also Niedenthal 2007; Niedenthal and Maringer 2009). Paula Niedenthal has surveyed other research indicating that (1) adopting emotion-specific facial expressions and postures influences preferences and attitudes; and (2) inhibition of bodily expression leads to diminished emotional experience (reduction in the experience's phenomenal intensity), as well as interference

in processing emotional information (Niedenthal 2007; Niedenthal et al. 2005). This latter result is further supported by studies indicating individuals who've received Botox injections, which inhibits facial expressions, report a decrease in the intensity of emotional experience (Davis et al. 2010) and are slower in processing emotional language referring to expressions (e.g., anger and frowning) requiring the paralyzed muscle (Havas et al. 2010). This research, coupled with the narratives of Moebius subjects, suggests that the embodied expression of emotional states—along with their social sharing—may be necessary for their being experienced (Cole 2010, p. 667).

The complementarity of inner and outer

The studies canvassed above are offered to lend initial plausibility to the idea that some mental states can be instantiated in some patterns of behavior. The bodily or facial expression of some emotions, for example, enables us to experience those emotions; the physical expression is part of the vehicle instantiating the emotion, not as an expression of a disposition but rather as part of its material realization. Removing the expressive aspect of this vehicle (Moebius syndrome, Botox injections) thus removes part of the emotion itself—and the experience of the emotion is altered accordingly. But to be clear: it does not follow from this that emotions are *identical* with their behavioral expression. There are private phenomenological, physiological, and neural aspects of emotional experience not exhausted by their behavioral manifestation. When I am genuinely happy and smile broadly, for example, my happiness is not simply *in* the physical features of my smile, or *in* the complex neural and physiological processes that enable me to perform such a smile. Nor does this evidence suggest that there are or must be *similarities* between the phenomenology of my emotion and its behavioral expression. The phenomenal character of emotion is clearly different in kind than its expressive behavior. Thankfully, for the evidence canvassed above to support DP (and thus challenge UP) the argument does not require *similarity* but rather *complementarity*.[16]

By "complementarity" I am referring to the property of a system whereby different components of that system come together to coordinate their respective functions and form an integrated or harmonious whole; this coordination enables the system to do things it could not otherwise do. For example, different components of an automobile's engine (cylinders, valves, pistons, crankshaft, etc.) coordinate their respective functions and enable the engine to instantiate a specific property (locomotion) it would not otherwise have. This locomotive property is independent of individual component functions but nevertheless dependent upon their harmonious integration. The components possess certain properties that make them functionally poised to integrate with certain other components of the system and become enablers for the locomotive process. Yet the locomotion is not, strictly speaking, *in* any of the individual components any more than happiness is *in* an upturned mouth or particular bit of neuroanatomy. Rather, the process of locomotion spans *across* them; it is enabled by the integration of the relevant components

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[16] Within the extended cognition literature, the move from *parity* arguments (arguing that, in extended cognitive systems, inner and outer states and processes function in similar ways) to *complementarity* arguments (arguing that external states or processes need not replicate the formats or dynamics of inner processes but might rather exhibit complementary properties enabling their harmonious integration) signals a move from "first-wave" to "second-wave" extended mind arguments (Sutton 2010).

(cylinders and valves but not ashtrays and seat belts). In this sense are the individual components of a system a constitutive part of a process without thereby being wholly assimilated *to* this process or any of its other constituent parts.

Similarly, in the case of some mental states, neural, physiological, and expressive-behavioral processes coordinate their respective functions to allow the subject to do something she could not otherwise do. To remove one part of this coordinated system—the facial expressive component, say, in the case of Moebius Syndrome or Botox injections—is to compromise the subject's ability to instantiate emotional experience. In this way is the behavioral expression part of the material vehicle of some emotional experiences the way that a piston is part of the material vehicle of locomotion.[17]

But to clarify further: the relation between the individual components of this vehicle is not one of identity. Even when the automobile is moving, the various parts which enable it to do so remain distinct before, during, and after its movement. But they are nevertheless part of the process of the locomotive process; without these parts and their complementary interrelation, locomotion would not be realized. Likewise, the behavioral component of an emotional expression remains distinct from, say, associated neural activity or the emotional experience itself. Denying UP therefore need not entail behaviorism.[18] The DP defender need not deny, as Hana Pickard appears to think they must, that "there seems to be nothing in common between experience and behavior: no respect in which they are the same, and so no prospect of explaining how they could be" (Pickard 2003, p. 93). Experience and behavior are two different things. What unities them is a not a similarity of kind but rather their place within a system composed of complementary components (i.e., a subject with a properly functioning brain and neuromuscular system, etc.). The end result is that instances of cognition and emotion are instantiated via the complementary coordination of neural, physiological, and behavioral components. Cognitive and emotional processes span across these components the way that locomotion spans across certain complementary components of an engine. So, in some circumstances, to see expressive behavior is to see part of a cognitive or emotional process.[19] As we will see below, however, more still needs

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[17] I revisit this idea in "The coupling-constitution objection."

[18] Pierre Jacob objects that DP, in denying that mental states are unobservable, equates mentality with behavior and thus collapses into a kind of crude behaviorism (Jacob 2011). See Krueger and Overgaard (2011) for a much longer discussion of and response to this and several related objections.

[19] Rowland Stout (2010, 2011) argues that, in order to take seriously the direct realist claim that to see facial expressions is to see emotions, we must think of facial expressions not as static signatures (i.e., causal upshots) of ostensibly "inner" emotions but rather as part of an ongoing emotional process. Though Stout frames emotional expression differently than I do, our views are, I think, nevertheless relatively close to one another. For example, Stout writes that, "[e]motional expression is a process of dynamic unfolding of changes in the face and other aspects of behavior; and it is a process that involves interaction with the world around and responsiveness to feedback from that world" (Stout 2010, p. 40). I am in full agreement. Elsewhere, I consider at length the fundamentally interactive character of social cognition, including emotional expression (Krueger 2011). And though in this paper I speak of gestures and facial expressions as proper *parts* of cognition and emotion, I also want to emphasize the fundamentally *processual* character of cognition and emotion. As the previous discussion as well as the discussion below suggests to see gestures and facial expressions is indeed to see parts—but not static parts or signatures but rather parts of ongoing, dynamic, and distributed processes. Stout's view is also helpful in responding to the Humean objection that we are never aware of processes, only individual stages of processes (see Stout 2010, pp. 37–40).

to be said both about what we see as well as how what we see gives us the social information that it does.

What do we see? Some objections to DP

Let us now return to DP. The different streams of evidence discussed above are offered to motivate the idea that parts of some mental processes are made visible via their distribution across the visible body. Some mental states are hybrid, consisting of both inner and outer operations. This lends empirical support to DP since we can see externally realized aspects of another's hybrid cognitive and affective states. If so, we have a reason to reject UP. Additionally, as a consequence of accepting DP and rejecting UP, we can see how an epistemically demanding cognitive task—inferring, simulating, or otherwise working out the inner content of another's mind to sort out what they are up to—is transformed into a more manageable process of directly perceiving vital social information. This is significant since, especially when we were young, the perceptual skills we possess for dealing with the external world greatly exceed the reflective or imaginative skills we possess, and which are needed to adequately deal with the internal world (Kirsh 1995, p. 64). DP therefore seems continuous with work in developmental psychology indicating that, from birth, infants are agile perceivers and actors in a meaningful social environment (Rochat 2009, p. 64; see also Hobson 2002; Reddy 2008).

An objection at this point is that gestures, for example, are far too coarse-grained a vehicle to adequately supply much in the way of social information. Even if gestures drive some forms of cognition, it might seem nonsensical to say that in perceiving gestures we perceive the *content* of another's thinking. But while looks can be deceiving, they can also be highly illuminating. Consider the fact that gestures can index moments of cognitive instability in students by externally representing[20] thoughts not yet capable of being verbally articulated. A child's gestures indicate an understanding of how to solve a mathematical equivalence task before the child is capable of verbally articulating their successful strategy (Goldin-Meadow 2003, p. 56). So, not only do gestures help the student think. The gesture is, in this context, additionally a shared (mutually perceptually accessible) representation of the learner's cognitive struggle. These gesture-speech "mismatches"—moments when gesture conveys different information from speech—are material carriers of the learner's working through a task that publically signal crucial transition points within the learning process (Church and Goldin-Meadow 1986; Goldin-Meadow and Wagner 2005; see also Alibali et al. 1997; Crowder and Newman 1993). A sensitive teacher, rather than having to guess or inferentially work out the inner content of

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[20] The term "representation" is a notoriously slippery term in cognitive science. Here, I simply mean that gestures can provide concrete images of various thinking strategies in action: for example, a younger learner can show with gesture how to solve a particular math problem even if they lack the vocabulary to fully articulate their strategy. This visuo-spatial format allows gestures to encode strategic information in rich, stable, highly configurable ways, thus giving others access to some of the details of *what* is being thought (i.e., content)—and not, then, simply the fact *that* thought is happening. I touch on these representational qualities of gesture a bit later in "What do we see? Some objections to DP". My thanks to Rasmus Thybo Jensen for pushing for further clarification.

her student's mind, can instead directly perceive the learning process dynamically play out within the spatial arrangements of student's gestures and shape her instruction accordingly.[21,22]

Something similar is also often at work in our perceptual detection of another's emotions. Nonverbal expressive behavior expresses emotion, articulates interpersonal attitudes, presents one's personality, and is crucial in negotiating dynamical aspects of social interactions such as turn-taking, feedback, and attention (Argyle 1975). Congruent gestures and postures convey mutuality of topic and interest; they also build rapport between partners (Goodwin 1981). However, there are many everyday cases where a gesture, facial expression, or whole body expression articulate information at odds with an individual's verbal report, thus highlighting another sort of gesture-speech mismatch. Head and bodily cues (facial expression versus posture, hand gesture, movement, etc.) carry different affective information (Ekman 1965). The former carries information about the specific emotion or affect being experienced but little about the intensity or level of arousal; the latter carries information about the intensity or level of arousal but little about the specific emotion or affect. So, when interacting with a colleague or loved one, I might perceive a mismatch between head and bodily emotional cues—perhaps my wife insists that nothing is wrong, convincingly feigns a smile, and yet I perceive a certain heaviness to her posture suggesting that something is bothering her—and I thus can utilize this mismatch to step in, invite her to share her troubles, and offer my consolation. Gestures and bodily expressions thus reveal salient, and often unexpectedly specific, information about an individual's cognitive and affective status (their mood or confusion over a particular task)—both by very literally articulating material aspects of the state itself as well as potentially signaling a mismatch of one sort or another—that receivers may utilize to alter their input and in doing so, transform the sender's cognitive and affective status.

Likewise, rather than being hidden intracranial entities, intentions are very often embodied in expressive actions, ripe for direct perception. Consider the "specification power" of human kinematics (Runeson 1985). Rune and Frykholm (1983) found that viewers of patch-light displays could accurately judge the relative weight of a box lifted by an actor simply by observing the actor's kinematics. Moreover, viewers could accurately judge the weight actors expected to lift based upon their kinematics but prior to their actual lifting. And they could even tell when actors were

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[21] Perceptual sensitivity to gestures is also crucial within investigative interviews—such as forensic interviews used for legal purposes—since spontaneous gestures can convey important additional information not explicitly found within a speaker's utterances (Broaders and Goldin-Meadow 2010).

[22] In light of these considerations, I need to qualify an earlier objection I made during the discussion of the amodal thesis in "Empathy and direct social perception" and concede that there is a sense in which another's mental life can be disclosed in a manner analogous to my moving around or manipulating a tomato to bring its occluded backside to perceptual presence. If gestures are the material vehicles for some cognitive processes, it follows that I can utilize the same sensorimotor skills to access hidden or unattended aspects of these processes the same way I can hidden or unattended aspects of solid opaque objects like tomatoes and chairs. I can crane my neck, move around, and achieve a better view on, for example, a student's gesture-speech mismatch. However, unlike with the amodal thesis, I am, quite literally, getting a better view of (part of) the cognitive process itself—again, the cognitive process as it plays out in the visuo-spatial dynamics of the student's gestures—and not simply an amodally present aspect.

pretending to lift a heavy box, discerning both the actual weight of the box lifted as well as the weight the actors intended to convey to the viewer. Similarly, Good (1985) found that viewers could, when watching point-light displays of staged social actions (asking for a light, chance meeting of old friends), discern whether the activity was intended and not simply a chance encounter. Crucially, it appears that this perceptual sensitivity to intentions—along with a host of other social contingencies like the timing and quality of expressive behavior and emotional attentiveness (Reddy and Morris 2004)—is present early on, developmentally speaking. Seven- to nine-month-old infants perceive certain actions as playful intentions (ambiguous acts like offering and withdrawing objects) with different goals and outcomes than when the same intentions are interpreted literally (Legerstee 2005, p. 124; Reddy 1991, 2008); 5.5-month-old infants distinguish between caregiver's mischievous versus neutral-faced expressions when a ball is offered than taken away, spending more time inspecting the first kind of look than the second and producing more person-specific than object-specific looks (Legerstee 2005). Three-month-olds can perceptually discriminate biological motion from non-biological movements in point-light displays (Johansson 1977). Like emotions and indices of cognitive activity, intentions, too, are thus often perceptually available via bodily kinematics and the subtle qualities of attention and interaction (Atkinson et al. 2007). From a very young age, perception offers sufficient evidence "for judging—without inference –not only what an agent does but what she is up to" (Proust 2003, p. 203). The "coarse-grained" objection does not adequately concede the skillful way that we pick up on, perceptually, the range of different social information directly available in bodily expression.

   To anticipate another objection: DP does not imply that we perceive *all* of the relevant mental phenomena in these contexts. Rather, the claim, recall, is that some cognitive and affective states are hybrid—and thus saying that we perceive aspects or components of some states directly is consistent with there being other aspects or components (i.e., inner psychological parts, neural substrate, phenomenological profile, etc.) not directly perceived. We clearly do not have perceptual access to the *totality* of another's mental life; you are capable of thinking, intending, and feeling things that I have no experiential access to. Thus, the transcendence intuition regarding the partial inaccessibility of other minds is preserved. To reiterate, however, this is not equivalent to the amodal claim discussed in section Empathy and direct social perception—again, the idea that we *perceive* behavior but amodally *experience* co-presented mental phenomena—since we do, once more, literally perceive aspects or components of some mental processes in patterns of expressive behavior. As the empirical evidence canvassed above suggests, some forms of expressive behavior are proper aspects or components of the mental phenomena being perceived. In seeing this behavior, we are seeing parts of another's mind. And the parts of another's mind that we do have access to in every day social interactions are, generally speaking, sufficient to provide a significant amount of social information.

   One might still insist that the perceptibility of gestures, for example, as well as their purported role in driving some cognitive processes, is not sufficient to establish that mentality can be perceived.[23] This is because gestures encode information

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[23] I am grateful to Rasmus Thybo Jensen and an anonymous reviewer for pressing this point.

involved in mental processes. But so do neural processes—and we were not inclined to say that seeing neural activity is sufficient to say that one has seen the mental state. So, it cannot be sufficient for seeing a mental state that one sees something (a gesture or bit of neural activity) that encodes information about that event.

This is a helpful objection since it allows us to highlight the unique contribution that gestures (to focus on this particular form of bodily expression) make to cognition. Some of the worries motivating this objection will be dealt with in the following section. For now, let me simply press the idea that gestures merely encode information involved in mental processes. Surely they do. This is part of their representational function. But they do more than this, too. Specifically, they—at least at times—*disclose* information, not merely *encode* it. That is, gestures, to borrow a phrase from Mark Rowlands, can be seen as acts of "cognitive disclosure" (Rowlands 2010, p. 212). Acts of cognitive disclosure are acts by which the informational structure of the environment (including one's body) is manipulated such that the world is revealed or disclosed as being a certain way. This act of disclosure is part of the subject's intentional directedness to the world; to intend the world is to disclose the world as being a certain way (as perceived, as imagined, as remembered, etc.). In the famous case of Otto and his notebook, the physical act of manipulating the notebook is part of the vehicle by which the world is disclosed to Otto in memory. The notebook makes available information (MOMA's location on 53rd street) not previously available, information that gives the world to Otto in a new (intentional) mode of presentation and thus opens up possibilities for further thought and action. Likewise, gestures can play a similar role in disclosing the world. As the studies surveyed earlier suggest, gestures—along with, to be very clear, both neural and other bodily operations—allow for new cognitive capacities to emerge that thus allow for new modes of intentional disclosure (the world as disclosed via memory or reasoning, for example). This discussion of cognitive disclosure admittedly requires more analysis than I can here give it (see Rowlands 2010, pp. 202–213). However, the point is simply that gestures have certain physical and dynamical properties that allow them to make causally distinct contributions to cognition and emotion. Beyond simply encoding information, they are at times, it seems, part of the material process of thinking and feeling itself, part of the physical vehicles by which the world is opened up as being a particular sort of way.

To dwell on this last point a bit longer: even if we grant that gestures merely encode information (as do neural processes), the *format* of their encoding is importantly different. Whereas neurons encode information via patterns of electricity that functionally links members of neural ensembles, gestures encode information via visuo-spatial dynamics that are, crucially, publically perceivable. Theirs is a representational format available to the naked eye: the information encoded is presented in an external, stable, and highly configurable structure that others can see and engage with. Given these characteristics, the information available therein—as the previous discussion of the coarse-grained objection indicated—is surprisingly rich and varied. We can see part of the informational content of certain thoughts and feelings being worked out via specific patterns of physical movement. These patterns are part of the physical vehicle for these thoughts and feelings (though not the *whole* thought or the *whole* feeling, as I have repeatedly indicated). So, we were licensed to say that when we see gestures, we see parts of some cognitive processes, part of the

physical vehicle in which they are realized. If we could in fact see neural patterns do their part in encoding information, it is not clear why we could not likewise claim to see them as part of their physical vehicle for certain cognitive and emotional processes.[24] However, in virtue of their representational format—again, the way they encode the information they do—neural patterns simply do not offer up the rich and highly configurable social information we find in gestures (as well as facial and whole-body expressions).

The coupling-constitution objection

There remains an even more potent objection lurking about. This is the "coupling-constitution" objection. According to this objection, claiming that gestures and behavioral expressions are proper parts of some cognitive and emotional processes, that is, part of the physical vehicle for these processes, is to commit the coupling-constitution fallacy. Fred Adams and Ken Aizawa argue that this fallacy, which they claim is rampant in the extended mind literature, results from inattention to the difference between causal dependencies and constitutive dependencies. In other words, "it simply does not follow from that fact that process X is in some way causally connected (i.e., coupled) to a cognitive process that X is thereby part of that cognitive process" (Adams and Aizawa 2008, p. 91). So, just because an instance of expressive behavior is *caused* by a particular antecedent emotion, say, it does not follow that the behavior is actually a constitutive *part* of the emotion. Claiming otherwise is akin to claiming that because the spinning of a bowling ball causally interacting with the surface of the alley leads to pins falling down, the process of the spinning thereby extends into the surface of the alley and the pins themselves (Adams and Aizawa 2009, p. 83). Inner emotions can cause outer behavior but they are not the same thing; nor are they constituents of the same process. To see external behavior is thus not to see cognition or emotion itself. UP is safe.

   The problem with this objection is that it overlooks the possibility of different sorts of dependency relations between inner and outer processes that are nevertheless sensitive to the "essential causal dynamics" (Adams and Aizawa 2001, p. 44)—the unique causal contribution—of each (Shapiro 2011, p. 180; see also Clark 2008, pp. 86–89). More simply, the objection presumes a simple linear conception of causation. Clearly the spinning of a bowling ball does not extend into the other

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[24] To drive this point home, a reviewer offers the following related objection: grant that organizing the spatial configuration of our local environments eases our computational burden and thus in some sense extends the mind out of the head into the world. The extended mind theorist need not say that in perceiving organized environments or the various tools (e.g., Otto's notebook) used to organize and navigate them I perceive another's mentality. I have my doubts, however. To be clear, seeing Otto's notebook sitting on a table is not to see Otto's mind. But the extended mind theorist would surely say that, in seeing Otto *use* his notebook (to navigate to MOMA, for example), I am in fact seeing genuine *cognitive activity*; and insofar as the notebook is a constitutive part of this cognitive activity, I am therefore seeing part of a mind in action. The notebook is not magically cognitive in and of itself. However, when it is used by a cognitive subject to encode, manipulate, and/or transform the informational structure of their environment such that this action discloses further information or makes available operations (i.e., cognitive capacities) not previously available to the subject—this is, recall, the idea at the heart of the extended mind thesis—it's not clear to me that the extended mind theorist *is not* committed to saying that seeing Otto's notebook in this context is thus to see part of Otto's mind in action.

things the ball comes into contact with in virtue of their physical proximity or causal contiguity. To see a bowling ball spinning across a lane is not to see the spinning *in* the lane or the pins. Neither do emotions extend into or across bodily expressions simply in virtue of their physical proximity or causal contiguity with the latter. However, this is not the claim here being defended; nor is this the relevant sort of dependency relation.

Rather, what is crucial is the role that bodily expressions of emotion, as well as the representational and/or disclosive function of gestures, play in generating new inputs for the cognitive system—inputs that enhance a particular capacity (the ability to experience some emotions more intensely or exhibit improved spatial reasoning, for example) that would not occur without the harmonious workings of the components collectively *enabling* these new inputs. Moreover, these new inputs (heightened emotional experience, improved spatial reasoning) generate outputs (actions such as speech, more gestures and expressive movements, written language, etc.) that affect the world and, "recycled as inputs, drive the cognitive process along" (Clark 2008, p. 131). This process is therefore an instance not of step-wise linear causality but a continuous, mutually modulatory, non-decouplable coevolution—an example of continuous reciprocal causation (Clark 1997, pp. 163–166).[25] So, while the different components of the cognitive system (brain structures, limbs, facial features, etc.) are distinct—as are their individual causal contributions—their individual operations are nevertheless a function of the operations of their partner components; the dependency relation at issue involves a different sort of coupling relation than step-wise linear causality. Accordingly, given the reciprocal circular dynamics driving these sorts of coupled systems, "any intuitive ban on counting inputs as parts seems wrong" (Clark 2008, p. 131). But the coupling-constitution objection seems to overlook this alternative dependency relation. Since the emergence of these processes depend upon the tight complementary coupling of neural, physiological, and behavioral factors, it therefore seems sensible to say that these factors are constituents of the process itself. Yet, to return to a now familiar point: the process is not *in* any of the individual components, strictly speaking. Rather, as an emergent property of the larger system—the coupling of its constituent parts—it might plausibly be said to span *across* them.

In response, Adams and Aizawa would likely argue that it does not follow that an *X* process must pervade all of an *X* system (Adams and Aizawa 2008, pp. 117–118). In other words, just because something is an *X* system doesn't entail that every part of the system does *X*. So, even if we grant that neural, physiological, and behavioral-expressive factors are constituent parts of a coupled cognitive or emotional *system*, it does not follow that they are all constituent parts of a coupled cognitive or emotional *process*. Consider an air conditioning system. Air conditioning systems consist of many spatially distributed parts: a thermostat with electrical connections to the house's breaker box, a refrigerant, expansion valve, evaporator coil, compressor, fan, insulated pipes, etc. These different parts are tightly and reciprocally linked by reliable interfaces. But not every component of this air conditioning system cools the air: evaporation coils do; the thermostat, ductwork, fans, and compressor do not

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[25] Merleau-Ponty speaks similarly of a "circular causality" coupling organism and environment (Merleau-Ponty 1963, p. 15).

(Adams and Aizawa 2008, p. 117). Likewise, core intracranial realizers (specific brain regions or patterns of neural activation) are causally responsible for various cognitive and emotional processes; gestures, expressive behavior, and facial expressions are not. The latter are part of an extended cognitive system but inessential for the realization of an individual emotional process.

But this reply does not work. First, to return to Adams and Aizawa's analogy: it seems a rather arbitrary bit of individualistic coil-centrism to insist that only evaporation coils are causally responsible for cooling air. After all, if a fan or expansion valve breaks, the air will no longer be cooled—even if the evaporation coils continue to function properly. It is thus not clear why we ought to give evaporation coils favored explanatory status. Evaporation coils—like every other part within the system—require the complementary functioning of various partner components to successfully contribute to the process of air cooling. Air conditioning only occurs when these various components and their respective operations integrate in the right sort of smoothly functioning way. Individually, however, *none* of the components are sufficient to realize air conditioning on their own. If anything, then, air conditioning appears to be the epitome of an extended process realized by the complementary integration of spatially distributed parts. As an extended or distributed process, air conditioning spans across these different parts; each component is a constituent of the process insofar as it contributes a necessary and distinct operation without thereby being the process' exclusive causal locus. To see an evaporation coil is thus not to see air conditioning. Rather, to see air conditioning is to see an evaporation coil, working in concert with other complementary components, make a constitutive contribution to the process of conditioning the air.[26]

On a related note—and to further clarify a point made earlier, one which gets to the heart of Adams and Aizawa's reply—the version of DP here argued for is not committed to the idea that a gesture *itself* need be cognitive or a facial expression *itself* need be emotional. Adams and Aizawa wrongly assume that, in defending the idea that some piece of behavior may be a constituent of some cognitive or emotional process, the DP defender—as well as the externalist more generally—is committed to the claim that the gesture is *doing* the thinking, or that the emotion somehow occurs *in* the facial expression.[27] But this simply is not the case. Cognition isn't in a gesture any more than it is in a neuron or assembly of neurons. Rather, certain properties of gestures—for instance, their visuo-spatial representational format which affords informational off-loading—*when combined with properties of certain other bodily features in the right sort of ways* are what enhances the cognizer's capacity to perform certain cognitive operations. Yet, not all parts of the human person are constituents of the various cognitive and emotional processes they enact. When I lose my hair (alas), I do not also lose my ability to think and feel (thankfully). This is because hair—unlike gestures or facial expressions or neurons—lacks the rights sort of functional properties and therefore plays no role in generating new cognitively salient inputs for the system. But in

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[26] Of course, an air conditioning system and its constituent parts are designed to function in very specific and relatively fixed ways. So, they lack the adaptability, autonomy, and flexibility characteristic of human cognitive systems.

[27] Lawrence Shapiro christens this the "Process-Constituent Fallacy" (Shapiro 2011, p. 181).

virtue of their functional profile, gestures, and facial expressions (and, indeed, neurons) *do*.[28]

Conclusions

I would now like to take briefly stock. I began by looking at the general contours of a phenomenologically motivated account of empathy and social cognition, focusing especially on the core DP thesis at the heart of this account as well as DP's denial of UP. I then looked at two possible strategies for defending DP and argued for the superiority of one of them. The superior strategy rested on adopting what I termed a "constitutive" sense of bodily expression. This proposal grounded a picture of social perception which emphasizes the way that bodily expression may, at times, play a constitutive role in driving some hybrid cognitive and affective processes—making material aspects of these processes publically, which is to say, *perceptually*, available, and thus serving as an external structure inviting another's attentional focus and interactive engagement. In short, expressions and gestures are more than mere signals or signs of thought and feeling; in many cases, they are part of the dynamic process of thinking and feeling itself. In support of this idea, I summoned several different lines of empirical research.

In order to take DP seriously as an alternative to inferentialist accounts of empathy and social cognition, we need to take seriously the idea that we can literally see aspects of another's mentality. While initially counter-intuitive, perhaps, this idea is increasingly supported by ongoing work in embodied and distributed cognition. If minds are genuinely embodied, it should not come as a great surprise to find that body's expressive dynamics may in some cases be a critical part of our processes of thinking and feeling—further solidifying our nature not only as embodied but additionally as fundamentally open, social beings.

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[28] Specifying what these complementary properties are, of course, is crucial. But this is an empirical question. All that is necessary for DP is to establish that, within an emotional system, inner (neurological, psychological, phenomenological) and outer (behavioral) processes a times play complementary roles in the realization of some cognitive and emotional processes.

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