

Does situated consciousness reveal something important about the structure of the physical world?

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Abstract. In this paper I consider whether consciousness may be the key to gain a better understanding of the physical world. I will defend the case for partitioning reality into extended spatio-temporal physical processes and will provide a sketchy outline of a view dubbed spread mind. I will consider a series of physical phenomena which may be shown to be private, have unity, first-person perspective, perhaps even quality. I will argue that, once we reconsider the physical world as our experience suggests, there is a unique ontological level composed of physical processes – such a level may be the physical underpinnings of conscious experience. The price to be paid is to conceive reality as a network of processes spread in time and space instead of as a bundle of particles instantiating locally their properties. Thus consciousness forces us to single out processes as the fundamental simples of reality. Eventually, I try to show how this model may cope with traditionally intractable cases of indirect perception such as dreams, perceptual memories, hallucinations and the like, exploiting a series of examples from optics.

Keywords: Consciousness, Extended Mind, Situated Cognition, Externalism, Phenomenal Experience, Spread Mind

1 The spread mind in a nutshell

Any claim about the alleged gap between phenomenal experience and physical world (Levine 1983; Chalmers 1996) ought to be based on a reasonably complete understanding of what the physical world is. Yet, this is not the case (Eddington 1929; Strawson 2011). Instead of considering consciousness as an obstacle, it may be seen as an opportunity to probe into the deep structure of reality – after all our experience is the closest we can get to reality. Since Galileo and Descartes most scholars have assumed that our experience departs from the physical world – experience and physical world are taken to have almost totally different properties. Yet, such alleged gap may be the result of adopting two different and incommensurable perspectives on the same phenomenon. In other words, how can we be so sure that the qualitative appearance of the world is not what the world really is?

The main reason is that the alleged ontology endorsing physics is different from our experience. Due to undeniable success of physics, many authors feel obliged to opt for the former. However, it might be the case that a different ontological framework could address

both physics and our experience. Consciousness would thus be the element forcing us to reconceive the current ontological foundations of physics.

In this paper I will consider a series of physical phenomenon which are indeed private, have unity, first-person perspective, perhaps, even quality. I will argue that, once we reconsider the physical world as our experience suggests, there is a unique level of physical processes that may be identical both with the physical world (as usually conceived) and our experience. I also claim that the physical underpinnings of conscious experience are identical with these processes temporally and spatially extended beyond the boundary of the skull and the skin. The price to be paid is to conceive reality as a network of processes spread in time and space instead as a bundle of particles instantiating locally their properties. Thus I will suggest that consciousness forces us to single out processes as the fundamental simples of reality.

The resulting model of situated consciousness is dubbed the Spread Mind (Manzotti 2006a; Manzotti 2006b; Manzotti 2008b; Manzotti 2008a). If this hypothesis had any merit, our experience would indeed allow us to gain an unexpected knowledge as to the structure of reality. The presented model outlines a form of vehicle phenomenal externalism more radical than either Clark's extended mind (Clark and Chalmers 1998; Clark 2008), or the briefly considered notion of the extended conscious mind (Clark 2009), or finally Dretske's content phenomenal externalism (Dretske 1996; Lycan 2001). There are also other forms of externalism which I cannot address here.

An example will help to sketch the gist of the proposal. Consider a subject looking at a pattern on a screen (for instance a letter 'A'). What she sees depends on various factors – such as her visual apparatus, her cognitive skills, her categorization ability. If all these conditions obtain, a certain configuration of dots on the screen will get causally engaged with the activity inside her brain. If that is not the case, the alleged configuration will not be seen. If she were equipped with different sensor modalities – X-ray vision, for instance – other configurations might be causally linked with her brain activity. What she perceives is not independent of her being there with a certain bodily structure. The process taking place because of her is not neutral as to the ontology of the world. She does not perceive the letter as if she was not there. What she perceives is the visual 'A' which is the result of the interaction of her body and certain patches of colors on the screen.

As anticipated, consciousness offers the opportunity to reconsider the physical world (Manzotti 2009). The proposed model suggests revising both the notion of consciousness and that of the physical world so that they may be identical. Of course, such conceptual operation must be both amenable of experimental verification and ontologically advantageous.

The Spread Mind stresses the role of processes in fleshing out the ontology of the world. Instead of conceiving the world as made of objects (or any other kind of localized simple) interacting with one another, the world is framed in terms of processes taking place in time and space. Objects are thus modeled as epistemic shorthands for bundles of processes. Thus, if phenomenal experience is real (and it is), it has to be explained in terms of processes. More precisely, it has to be made of physical processes. Processes are extended in time and space and their boundaries are fixed by their causal connections.

Given such relatively innocent ontological revision, we can reconsider consciousness, too. Whenever we perceive something, a process – beginning in the environment and ending in the brain – occurs. Such a process fixes the content of perception by singling out a portion of the external world. Could it be that the ineffable phenomenal experience may be such a process in all its entirety? As I will argue such a process is not hampered by the usual limitation of neural processes since it contains those parts of the world that are to be represented. If this process singles out the object and is the experience of the object, there is no longer any separation between the representation and the represented, between neural activity and external objects, between the vehicle and the content of experience. The suggested process-oriented perspective allows us to focus on the occurrence of a process which can be conceptualized either as the subject's phenomenal experience or as the perceived object – both descriptions (experience vs. external object) are nothing but two incomplete views on the same physical process. Consciousness is thus a situated physical phenomenon.

According to an internalist perspective (Crick 1994; Kim 1998; Koch 2004), the neural endings are the only relevant part of the process. This is by no means obvious. On the contrary, by adopting the Spread Mind perspective, the suggested physical process comprehends the perceived pattern. More precisely, the pattern comes into existence because of the process (Manzotti 2009). There are no longer intermediate descriptions of the world (Manzotti 2010). There are no more internal re-presentations of the world. There is only the occurrence of the world itself and the subject is made of it. The Spread Mind suggests that the aforementioned physical process is the physical underpinning both of the phenomenal experience of the pattern *and* of the pattern. The two notions are taken to be nothing but two different perspectives on the same physical occurrence.

At the best of our knowledge, the physical world is made of basic entities such as atoms and energy units. However, they are not what we are aware of. The macroscopic world of our everyday experience requires an ontology for macroscopic objects. Peering into the structure of consciousness suggests that such an ontology is grounded on processes rather than on objects.

In order to suggest a match between phenomenal aspects and the physical description of reality, a preliminary question should be answered: what are the physical ultimates corresponding to our phenomenal experiences? Where and what am I? Informally, how do we chop the physical world into pieces in such a way that these pieces are hopefully likely to match our experiences? In order to know whether phenomenal qualities are located and whether a coherent picture exists on which phenomenal qualities are physical, we need to outline a proper way to partition the physical world. Against this background, I will here sketch a process-oriented model addressing such an issue – my assumption is that reality is composed of processes singling out causally delimited spatio-temporal portions of reality. I take phenomenal experiences to be a fact of the world – the only one whose nature is directly experienced and knowable by ourselves. They are contrasted with the physical description of facts. The goal is to identify which facts or processes in the world physical description are indeed identical to the occurrences of phenomenal experiences. Such processes would be identical both to the physical world and to our experiences. Their qualitative intrinsic nature would be identical to their numerical occurrence. The advantage of partitioning reality in this way is that such processes may target both our experiences and

the external reality. In so doing, each process is a presentation of an aspect of reality and it may thus help in further refining a model of direct perception.

2 Where are phenomenal qualities located?

If we take the hypothesis that phenomenal experiences are facts of the world seriously and if we are physicalists, I believe we must assume at the onset that phenomenal experiences are physical phenomena. This assumption has important consequences. Each physical phenomenon takes place in a given place and at a given time. Then a preliminary question for any naïve physicalist account of consciousness is: where and when our phenomenal experiences take place (pace Rowlands 2011, p. 83)¹. One way to answer to such a question may consist in looking for physical processes sharing many of the properties of our experiences. This is not what is usually done. The traditional approach is to have an a priori idea as to where to look for and then to force some interpretation upon such a physical substrate in order to show that it is indeed identical to our experiences. The example at hand is, of course, neural activity in the brain. As far as we know, neural activity does not share any of the properties of our experiences. Whereas our experiences are made of phenomenal unities, neural activity is scattered in many temporally and spatially separate areas. Whereas our experiences have first-person perspective, the firings between neurons are third-person events. Our experience is coloured, shaped, meaningful. In contrast, neural activity does not possess any of this properties.

May we look somewhere else? Let me start from a very ordinary consideration. When I look at an object, say a brown round-shaped table, I have an experience that is brown, round-shaped, and tablish, let's say. If I look at the physical activity in my brain, I'm not going to find anything remotely round, green or tablish. Is there anything, in the physical world, that shows some of these features? I am tempted to say that there is something very close, albeit not totally identical with my experience. The most promising candidate is naturally the table itself. The table is very tablish, no doubt. It is unquestionably round and, not very satisfactorily, brown. In fact, colour, as is very well-know, depends heavily on the beholder's perceptual apparatus. If I were colour-blind, my phenomenal space would be completely different and the notion of brown may be meaningless for me. If I were tetrachromat, the colour of the table would be different in another way. And so on. Yet, the roundness of the table seems to be undeniable as well as some tablishness. Is colour a strong-enough aspect in order to reject such a tempting candidate? I believe not. Let us refine a little this first externalist attempt at locating our phenomenal experiences.

This time, instead of considering the table in front of me, a process view of physical reality is adopted. In other words, I will set aside the object-based view of reality, in favour

¹ Surprisingly for an externalist, in his last book, Rowlands claim that “the idea that cognitive processes are extended can easily tempt us into thinking of mental processes [...] having a definite spatial location [...] that incorporates expanses of the extracranial world. [...] That is, there might be no fact of the matter with regard to where a given token cognitive process occurs”. In contrast, I assume that all physical phenomena must take place in a given place and time and thus, if mental tokens are physical, they must have a place and a time.

of a process-based one. Each time I look at the table a process takes place from the table surface, crosses my eyes and, eventually, ends in my brain. Such a physical process should suit physicalists of any stripe. This physical process has interesting properties. Let me list them.

First, the process has first-person perspective since it singles out reality depending on the properties of the beholder. Different properties either of the beholder's brain or the beholder's perceptual apparatus would single out different properties from the table surface – different events in the outside world will join the process. For instance, if I were colour blind, many reflectance properties on the surface would not produce any effect and thus would not be part of the process.

Second, the process shows a causal and physical unity (Manzotti 2009). Many separate events in the world interact jointly in order to produce a final outcome, from a causal perspective, the process integrates together many external events that would otherwise occur isolate from each other. I look at the table and the left and right side of it are perceived jointly. Thus the two sides partake to the same process and cause the same effect. If I were not looking at the table, there would be no physical process originating from them and ending in a joint effect.

Third, the occurring process is responsible for the existence of its object. This is an important issue. Of course, the table as an aggregate of particles is there independently of our perception of it. But the table of my experience is very different from such an aggregate of particles. The table we are acquainted with is tablish, round, and brown. Further, the perceived shape is round but contemporarily elliptical due to the point of observation (Kelly 2001). The table I have an experience of is different from the table that a congenitally blind subject may experience. So our experiences are different. The physical processes taking place are different too. The table as an aggregate of particles is the same for everyone, but it is not the table perceived by anyone. However the table as a process instantiated between the aggregate of particles and my body is different from the table as a process occurring between the aggregate of particles and the congenitally blind subject's body. The process, we are discussing here, singles out precisely my own table. The congenitally blind subject would have a different process.

Fourth, the process has something very similar to the notion of being-there. The process takes place. It does not last, endure, or perdure. It does exist only insofar as it happens. The unity of the process is a temporal unity and thus it is akin to the phenomenological notion of being-there. Its reality is tightly bound to the becoming of a single moment of existence. It appears, lives and dies at the same time.

The above list ought to show that such a process scores a lot better than neural activity in matching the properties of my experience. It is private. It has first-person perspective, unity, being-there. Furthermore, it fleshes out the reality we experience. It looks like a very tempting candidate. Such an externalist process-based view may offer to panpsychist a viable physical model. To recap: Where are phenomenal qualities located? They may be identical with the occurrence of processes extended in time and in space, originating in the environment and ending in the cortical areas. Neural activities and neural structures are necessary for such a process to occur but may not be sufficient. The process is partially external to the nervous system.

3 Is there a coherent picture on which phenomenal qualities are physical properties?

May we take the proposed view seriously? I fear there are, among the others, at least three reasons of concern – which I will try to dispel in the followings. First, is that process compatible with our understanding of the physical world? Second, does such a process match with our phenomenal experience? Finally, it must be questioned whether such a process may indeed have intrinsic quality?

As to the compatibility between such a process and the physical world, there should be no obstacles. There is not even need to set aside the traditional bedrock of material particles. However, it is clear that the world of particles does not exhaust the world of processes. Physical reality is intrinsically dynamic. There is also some evidence that a process view of reality may be more fundamental than a particle view (Stapp 1998). The process as described here does not require the emergence of any unexpected property. It is simply the occurrence of a causally continuous chain of events. The only requirement – only partially outlined here – is that the process must allow a set of causes to act jointly (Manzotti 2009). Consider what happens when you perceive a face. A set of separate visual features act jointly to produce a final effect. Consider again the example of the table in which different patches act together to produce the form of its surface. Consider the perception of a pattern made of different dots. Once again the dots cause jointly an effect. If there were no observers, those dots would continue to carry on their individual life, so to speak (Manzotti 2009). They would remain causally separate from each other.

The second issue is more troublesome. Does such a process match with our phenomenal experience? The answer to this question we need to resort to phenomenological analysis. Yet, the process, as mentioned in the previous section, has many of the properties attributed to our experience (unity, becoming, being-there, temporal aspects). The most worrisome issue is whether physical processes have intrinsic quality. If we could argue that physical processes have intrinsic quality, the identity between intrinsic quality and phenomenal quality may be persuasively defended. The only argument that I can conceive of is of Russellian nature: “All that we do know, on assumption of physicalism, is that the physical items whose intrinsic natures we have direct access to are intrinsically conscious.”(Coleman 2009, p. 87). Yet, what exactly are those “physical items”? Many scholars have assumed that such physical items should be located inside the head. However, as I have argued in the first section, there are no compelling reasons to do so. We don’t know a priori what are the physical items that are identical to our phenomenal experiences. Most neuroscientists believe that such physical items must be neural processes. Yet, neural processes do not score very well in phenomenological terms. That is why I suggest to consider other physical processes more extended in time and space. So we need to locate the best candidates as the physical items that are our phenomenal experience. Thus our personal consciousness may be a way to probe into the intrinsic qualitative nature of reality.

The previous paragraph leads to the last question mentioned at the beginning: does such a process have intrinsic quality? Since our only possibility to know whether a portion of the physical world has intrinsic quality is being that portion, we can only know for sure that the processes composing us have intrinsic quality. And indeed we know it. What is to be clarified is what and where such physical items are. My proposal is that such physical items

are physical processes extended in time and space beyond the limits of the body. This insight runs afoul smallism – the view that the ultimates of reality must be the smallest entities. It suggests a kind of holistic panpsychism in which the ultimates are extended processes instead of small particulars or individuals or items.

4 A better way to partition physical reality

I take phenomenal experiences to be facts of the world – the only ones whose nature is directly experienced and knowable by us. On the other hand, there is the physical description of facts. My goal is to identify which facts in the world physical description are indeed identical to the occurrences of phenomenal experiences. Once this is done, phenomenal/intrinsic qualities in the world will have their place in the physical picture of reality.

What is physical reality composed of? The question, as mentioned in the previous sections, is not neutral to the success of a panpsychist enterprise. In fact, it is possible that different strategies to partition reality may lead to different possibilities for panpsychism. A popular way to partition the physical world is to split it into separate portions of matter whether they are infinitely divisible like a continuum or made of indivisible atoms. This strategy, based on the notion that the physical world must be made of stuff is akin to the idea that the world is made of matter as opposed to space, time, energy, fields, forces, and many other things that populates any textbook of physics. This should raise some suspicion as to the soundness of the just outlined reduction of physical reality to such simple stuff. The strategy, no matter how popular, may be a little too much simplistic. A different approach has been described here. Reality is made of processes. Processes are spatio-temporally located and have a definite causal role. However, they do not reduce to pure functional relations since they are actual occurrence of energy and matter that somehow transfer such quantity from one place in spacetime to another. I won't get into the details of this difficult issue here. I consider processes like the ones addressed by Reichenbach (Reichenbach 1958; Reichenbach 1971; Salmon 1977; Otte 1986; Dowe 1995; Salmon 1998; Dowe 2000).

Processes may easily be used to compose objects. In fact, going back to our familiar brown round table, each time I look at it, a new process takes place. And I may add that a new table takes place as well. In fact, each time I blink my eyes, a very fast demon may swap my table with another one with similar proportion and color, I would be blissfully unaware of the change. If this example may seem a little farfetched, consider that it is exactly what happens in the familiar experience of movies. When you look at a movie of a still table (a very boring movie!), you never see twice the same physical thing. In fact, movie frames are swapped very quickly at the well-known speed of 24 frames/sec. Each time you look at the silver screen, what you see is caused by a physically different piece of film. Yet, your experience is that of an uninterrupted and continuously existing table. The case shows how easily persisting and perduring objects may be built out of series of numerically distinct processes.

Once reality has been slit into processes instead of pieces of matter, a different framework becomes more clearly visible – an object is nothing but a bundle of processes as well as an experiential subject is nothing but a different bundle of processes. If such processes have the

properties of having a unity, being-there, first-person perspective, and privateness, why shouldn't they be the parts a subject is made of?

The conclusion, indeed to be further refined in further works, is that a different way to partition reality may help in finding the proper physical ultimates corresponding to phenomenal experience – the physical ultimates where phenomenal experience and intrinsic qualities are the same.

In a nutshell, the following points outline the proposed way to partition physical reality (Manzotti 2006c; Manzotti 2009; Manzotti 2011b; Manzotti 2011a).

1. The physical world is made of physical processes. Rather than conceiving the world as made of objects interacting with one another, there is no obstacle to conceiving the world as made of processes taking place in time and space. Objects are epistemic shorthand for bundles of processes.

2. If phenomenal experience is real (and it is), it has to be explained in terms of processes. It has to be made of physical processes.

3. Processes are extended in time and space and their boundaries are fixed by their causal connections. The relevant kind of causal connection must be further refined, of course.

4. Whenever we perceive something, a process – beginning in the environment and ending in the brain – occurs. Such a process fixes the content of perception by singling out a portion of the external world. Such a process is neither mental nor exclusively neural insofar as it contains a part of the external world. In this process the intrinsic qualitative and the phenomenal experiential are one.

5. There is no separation between the representation and the represented, between neural activity and external objects, between the vehicle and the content of experience. The suggested process-oriented perspective allows us to focus on the occurrence of a process which can be conceptualized either as the subject's phenomenal experience or as the perceived object – both descriptions (experience vs. external object) are nothing but two incomplete ways to address the same physical process.

6. Phenomenal experience is no longer a phenomenon different from physical processes taking place inside the brain. Phenomenal experience is one way to address how the physical world is singled out in bundles of processes.

An example may help to catch the gist of the model. Consider a subject looking at a white wall with black dots scattered on its surface. Some of these patterns may be grouped into a face, while others may be grouped into other shapes. Due to many different factors, the subject is going to perceive only one shape at a time. Each time she perceives something, a different physical process with different causes and different intermediate and final events is going to progress from the surface of the wall to the inside of her brain. Such a process carves out exactly the particular configuration the subject is aware of. The configuration was not there before being perceived, yet it is neither a creation of the mind nor something concocted inside the brain of the perceiver. Loosely speaking, both the neurons and the dots on the wall are cooperating to endorse the occurrence of a process which is the stuff both the configuration (the external object) and the phenomenal experience are made of.

According to an internalist perspective, the neural endings are the only relevant part of the process. This is by no means obvious. On the contrary, the suggested physical process comprehends the perceived pattern. More precisely, the pattern comes into existence because of the process. There are no longer intermediate descriptions of the world. There are no more internal re-presentations of the world. There is only the occurrence of the world itself and the subject is made of it.

I suggest that the aforementioned physical process is the physical underpinning of both the phenomenal experience of the pattern *and* the pattern. The two notions are taken to be nothing more than two different perspectives on the same physical occurrence (Manzotti and Tagliasco 2001; Manzotti 2006b; Manzotti 2011a). The pattern as a whole is the intrinsic qualitative nature we experience. To have an experience of the pattern means to be that pattern – both terms are the same process.

Consider a subject looking at a pattern on a screen (for instance the letter 'A'). What she sees depends on various factors – such as her visual apparatus, her cognitive skills, her categorization ability. If all these conditions obtain, a certain configuration of dots on the screen will become causally engaged with the activity inside her brain. If this is not the case, the alleged configuration will not be seen. If she were equipped with different sensor modalities – X-ray vision, for instance – other configurations might be causally linked with her brain activity. What she perceives is not independent of her being there with a certain bodily structure. She does not perceive the letter as if she were not there. What she perceives is the visual 'A' which is the result of the interaction of her body and certain patches of colours on the screen.

Consider again the difference between the table as an aggregate and the table as a process. Only the latter is the table I have an experience of.

The assumption of the existence of the pattern corresponding to the letter 'A' waiting to be perceived is an oversimplification. The so-called pattern is either a visual pattern, or a tactile pattern, or an auditory pattern, and so forth. Every alleged autonomous target of perception is indeed singled out by an actual perceptual process. The pattern is something that takes place rather than being a static and autonomous entity waiting to be perceived. In other words, the Spread Mind suggests that there is no pattern before the occurrence of the process. The pattern takes place whenever the conditions for its occurrence are met. The pattern is identical to the process.

The emphasis on processes is compatible with an ontological bedrock. Of course, before the perceptual process, there must have been other processes and there must have been a pre-existing reality. The pattern was not already there. I am not defending an idealist view. The pre-existing reality constrains what may or may not take place. When the subject opens her eyes, there are limitations as to what she may see. Yet, to a certain extent, her bodily structure has a role in singling out one actual process from the many still available. She cannot see a pink elephant, but to a certain extent what she will see depends on her cognitive and bodily structures. For instance, she may see an 'A' or three barely connected segments. Before her perception of the pattern, there are the dots, but the dots are not the pattern. In turn, the same argument may be used to deal with the dots. Of course, below a certain physical level, there may be a bedrock of atomic simples.

What is the “pre-existing reality”, if it is not a perceived pattern (e.g., the letter ‘A’); and how does it constrain perception? Is it a Kantian noumenon? How do we know about it (obviously not through phenomenal experience)? As a matter of fact, from an epistemic standpoint, we have an experience only at the macroscopic level. We *are* identical to such a part of the physical world (made of processes extended in time and space). And what about the microscopic level then? I do not rule out the possibility that there are aspects and constituents of the physical world that do not participate as distinguishable components of our experience (I am not aware of what lies in the underground of my town, yet I am walking over it every day; I am not aware of very small or very short phenomena, yet they happen). For example, I don’t know anything of the intrinsic nature of an electron, since the processes that constitute me are much bigger.

5 Direct perception of traditionally indirect cases

As mentioned at the beginning of this paper, the main obstacle facing any externalist account (no matter if backed up by panpsychistic liberties) is the issue of cases of indirect perception such as perceptual memory or perceptual imagination? May externalism deal with such cases? There is a consensus that this question should be answered negatively (Edelman 1989; Lehar 2003; Metzinger 2003; Koch 2004; Revonsuo 2006). The main reason is that in such cases it seems fairly obvious that there is no external object to perceive. Yet such a widespread assumption may require rethinking.

Let us reconsider the outlined proposal. Our phenomenal experience may be identical with physical processes extended in time and space. Such processes single out the external reality we have an experience of. Thus, when I see a table, I see my own table which is not exactly the table in itself (if I am colour blind, my table would not be brown). My own table is a given process occurring between the world and my brain. My experience of the table and my table may indeed be the same process. This model supports the claim that intrinsic quality and phenomenal quality are indeed the same (Coleman 2009). The intrinsic quality of being that table (my own table) and the phenomenal quality of my experience would be the same. So, as I tried to argue, the physical underpinning of my mind would be spread in time and space.

How can we extend this model to all cases of phenomenal content (perceptual memory, dream, veridical perception, and so forth)? The main idea is that such cases may be explained as cases of perception with various temporal and causal geometries. Perceptual memory is thus seen as a case of postponed perception? After all, is there any theoretical or empirical argument against a perceptual process lasting for 300 sec instead of 300 msec? Or even 300 hours or 300 days? I claim that the same kind of causal coupling taking place during everyday perception occurs also during all cases of indirect perception.

It could be argued that the kind of physical continuity between a past event and the moment of its recollection is only a case of causal connection between past events and current dreaming experience. There is merit in this argument and it is a point well taken. Yet, this is no different from what happens in veridical normal perception. When one perceives a tree in front of oneself, there is both a temporal delay and a causal connection between the light bouncing on the surface of the tree and the activity in one’s brain. The case is no different from what happens when one is dreaming – there is a temporal delay and

a causal connection. The same conditions obtain for internal neural activity – between two subsequent spikes there is a temporal delay and a causal connection. If we consider the possibility that a series of neural spikes (separated by time and causal connections) constitute a unity of some kind, why should we reject other cases? This is not a negotiable issue. It has to be admitted explicitly. Since processes are extended in time and space why should not past events constitute phenomenal experiences of memories, dreams, and the like?

Indirect perception cases may be cases of postponed perception. Yet, isn't their phenomenal content often unreal? What if I dream of the canonical flying pink elephant which I never met? I argue that such cases may indeed be shaped as direct perception and that it is always possible to point at physical external objects. The argument is twofold: first, the elementary components of dreams supervene on external physical objects met by the subject during her life; second, the "creative" aspect of the mind is limited to a recombination of past elementary elements.

As to the first issue I draw on empirical evidences (dream content, bizarreness of dreams, lack of phenomenal content in congenitally blind subjects, and so forth). Systematic studies of dream content showed a remarkable lack of novelty in dreams with respect to real life both in normal subject or in visually impaired ones (Pons 1996; Domhoff and Schneider 2008b; Ittyerah and Goyal 1997; Snyder 1970; Kerr and Domhoff 2004; Dorus, Dorus et al. 1971; Hurovitz, Dunn et al. 1999; Domhoff and Schneider 2008a). The overall finding is that "dreaming consciousness" is "a remarkably faithful replica of waking life" (Snyder 1970, p. 133).

As to the second issue, I outline a direct model of perception that shows, with real examples from optics (semi-reflecting mirrors, lenses, kaleidoscopes, shattered mirrors), that most imaginings may indeed be cases of reshuffled veridical perception. Although the model is based on an externalist view I outlined elsewhere (Manzotti 2006c; Manzotti 2010; Manzotti 2011b; Manzotti 2011a) so far it has not been presented anywhere.

So, let us consider four cases roughly corresponding to four phenomenological cases: *veridical perception*, *veridical perceptual memory*, *perception of unexpected and never occurred combinations*, *hallucination*. I won't consider the possibility that one may have a phenomenal content of something new in its intrinsic quality. For instance, one case is to dream of a pink elephant. A totally different case is to dream of an unknown color, of the feeling I would have if I were a bat and I could perceive ultrasound, and so forth. At the best of my knowledge, the latter case has never been reported – an absence of crucial importance. Let us consider the four mentioned cases.

Veridical perception. This is the case we have been discussing so far. We perceive a table and the table is a few centimeters in front of us. It is not too hard to conceive a physical process encompassing the table surface, the eyes, and the neural activity in the brain. However, this conceptual step is not of minor importance since it considers a process extended in time and space. Representation is thus a process that constitutes us. The table is then identical to a process extended for roughly 300-500 msec. The table we perceive is spread in time (and space as well). *Optical example:* you look at the world behind a perfectly transparent glass. There is no need to assume the existence of an intermediate image of the

world on the glass surface. As a matter of fact, any intermediate screen requires a negligible time to be crossed and thus it introduces a time lag.

Veridical perceptual memory. I either recall – or daydream, or imagine, or dream – something that I really perceived. For instance, three days from now, I may be dreaming the table that lies in front of me right now. It is conceivable that, due to various cellular mechanisms, the causal influence of the table extends to future events. Yet the causal origin of the process is preserved and indeed, there is no reason to reject a 3 days process once we have accepted a 300msec one. A process lasting 3 days is perfectly acceptable. The table we perceive, either in our memory or in our dream, is a process lasting 3 days. Longer times are conceivable. *Optical example:* suppose having a glass that slows down light rays. When you look at it, you will see the past. However, you will not see an image of the past, you will perceive the past. The difference is that the causal path became slower and thus the temporal length of the process is increased.

Perception of unexpected and never occurred combinations. You dream of the pink elephant. I emphasized the fact that each process join together otherwise separate events. When you look at a face, visual features act jointly to produce an effect. However, in everyday perception, external causes are singled out in such a way that they are synchronous. This is not necessarily the case, though. For instance, when we perceive an uttered sentences or a melody, events that are taking place at different times act together (the uttered syllables). When we are disconnected from the proximal environment, more unusual integration may take place. So events that took place in my past in different locations at different times may cause together something in my cortex. Thus the cause of what is taking place now is a scattered whole whose parts may nevertheless be traced to actual perception. *Optical example.* At 6 p.m. you look through a shop window screen. You look at a pair of shoes. Due to the light conditions, the window screen plays both the role of a transparent surface and that of a mirror. As a result you see your face superimposed to what there is behind the window screen. Your perception, as often happens, is that of your head on top of a pair of shoes. Is this a novel phenomenal experience? An original content? You know that this is not the case. Automatically you discount your head. Yet, there are two perfectly physical processes: one from your face, bouncing on the window screen, and entering into your eyes; another one from the shoes, passing through the screen and finally entering into your eyes. Similar considerations may be held for mirrors.

Hallucinations. Normally our body is tuned to those processes that are more useful for our survival. Thus the most likely candidate for our phenomenal experience are those causes in our environment that may be either dangerous or useful – namely, other human beings, animal, moving objects, obstacles, and so forth. It is conceivable that due to various reasons unusual causes may succeed in passing through our causal bottlenecks. Yet they may still count as cases of direct perception. *Optical example.* Consider having lenses that allow you to access unusual aspects of the world and that combine the previous cases mentioned so far. Consider the possibility to mix wildly events of your past with present perception. Consider a kaleidoscope or a broken mirror where some of the reflecting and transparent surfaces is also a temporal lag and thus is extending the causal influence of past events.

In sum, instead of considering normal perception as a special case of dreaming as some authors suggest, dreams are seen here as a delayed and disordered case of perception. Thus

it is finally obvious why I suggested a direct perception model to address cases of apparent object-less perception (hallucinations, dreams, after images, phosphenes, and the like). By and large, I suggest that all cases of phenomenal experience may be explained as cases of perception displaced in time and space according to more or less unusual causal geometries.

6 Rainbows and panpsychism

In Iceland there is a spectacular fall in a place called Skógarfos. It is a special place due both to exceptional conditions in the shape of the surrounding cliff and to the angle of sunrays. If you walk closer to the water, you can see a rainbow around you. If you walk closer to the fall, the rainbow gets smaller and smaller but it remains centered around you. The rainbow you see is a physical phenomenon – no metaphysical mystery about it. Yet, each tourist has her own personal rainbow. You may see your own rainbow but you cannot see someone else's rainbow. Further, all rainbows are private. They possess being-there. They take place again and again. They are observer dependent but they are also constitutive of their observers. Finally, each of them singles out a colored form. Each of them is a process in which the traditional distinction between subject and object is meaningless. Each of them is a process where the distinction between phenomenal experience and intrinsic quality is meaningless, too. Is all reality like a rainbow?

7 References

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