

CONSCIOUS AWARENESS AND BEHAVIOUR: WHAT DISTINGUISHES CONSCIOUS EXPERIENCE FROM UNCONSCIOUS PROCESSES?

CONCIENCIA CONSCIENTE Y COMPORTAMIENTO: ¿QUÉ DISTINGUE A LA EXPERIENCIA CONSCIENTE DE LOS PROCESOS INCONSCIENTES?

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RESUMEN ABSTRACT

El presente artículo analiza el concepto de conciencia consciente. La actividad del cerebro se puede dividir generalmente en dos categorías: procesos inconscientes y aquellos que contribuyen a la construcción de la experiencia consciente. Aquello de lo que somos conscientes y experimentamos y lo que no.

La comprensión de la conciencia requiere la comprensión de cuáles criterios separan a ambos. Por ello planteo un rol importante del comportamiento en esta distinción. Sugiero un medio para separar la experiencia consciente considerando el tipo de comportamiento expresable al que corresponden los procesos inconscientes.

This paper considers the concept of conscious awareness. The activity of the brain can generally be divided into two categories: unconscious processes and those that contribute to building conscious experience. That which we are consciously aware of and experiencing; and that which we are not.

An understanding of consciousness requires an understanding of what criteria separate the two. I argue a role for behaviour in the distinction. I suggest a means of separating out conscious experience by considering the sort of expressible behaviour that unconscious processes correspond to.

PALABRAS CLAVE

Comportamiento, cerebro, conciencia consciente, experiencia consciente, conciencia, procesos inconscientes.

KEY WORDS

Behaviour, brain, conscious awareness, conscious experience, consciousness, unconscious processes.

Introduction

It is generally accepted that our conscious experience is a product of neural processes in the brain. If the brain were damaged in certain ways we would lose the ability to have certain conscious experiences, and if it stopped functioning it is generally believed that our conscious experience stops with it. But despite knowing them to be so intimately connected, how we go about explaining the connection between brain function and conscious experience seems to remain as much up for debate as ever.

Observation shows us one hundred billion interconnected neurons, and electrical impulses passing between them. We see the firing of these neurons leading to physical changes in a person, such as the stimulation of their muscles or the secretion of hormones etc. And we know that, somehow, out of this, also come our conscious experience¹.

I use the term conscious experience in the same way as Chalmers (*The problem*) in a recently reprinted article in this journal. Conscious experience is the 'hard problem' of consciousness. We are likely still a very long way from any satisfying account of this phantasm of experience, Nagel's 'what it is like'. And in this paper I do not intend to offer any solution. I have no blueprints to help us build a bridge across Levine's 'explanatory gap'.

Instead, the concept this paper will consider is the (easier?) problem of conscious awareness. The two ideas, conscious experience and conscious awareness are intertwined. What we are aware of is what we consciously experience; it is unintelligible to suggest that one has a conscious experience that one is unaware of. The common understanding is that, out of the myriad of electrical signals in the human brain, there are some that give rise to conscious experience and others that remain unconscious processes. In considering the structure of conscious awareness, what we want to consider is by what means we distinguish the two. Is there a means of saying why *this* pattern of electrical signals should equate to *this* conscious experience? While *that* pattern, equates to *that* experience?

¹ We know that it comes 'out of' the brain only in the sense that damage to the brain can demonstrably disrupt a person's consciousness, and that changes in states of consciousness, such as with a person entering sleep, are always accompanied with distinct changes in neural processes. However, it remains possible, as many have proposed that the consciousness itself is a product on more than the neural function alone.

More specifically I wish to argue for the role of behaviour (which will be defined more fully as we progress) in helping shape our awareness and so our conscious experience. What will be suggested is that conscious awareness only makes sense *in terms of* behaviour. Doing so, I aim to show, is the simplest way to reify mental states in bodily function.

The argument proceeds as follows: We first begin with a statement of the problem, and address the fundamental aspect that existing concepts fail to explain. I then consider the reasons why behaviour, as it will be defined, should be looked to to fill the gap, and in what sense I think we should consider it to do so. I then sketch a description of the manner in which behaviour could be said to separate the unconscious processes from conscious experiences. Given the intimate relationship between the structure of awareness and the substance² of conscious experience, I will end by briefly considering what implications this role for behaviour might have for any understanding of conscious experience itself.

Attention and its allies

Let's consider a person's response to a visual stimulus. Imagine there is some object in a room which is positioned such that light striking its surface is reflected towards a person's eyes. The light enters their eyes and stimulates the cells of their retina. This causes electrical signals to be sent to the brain which goes on to cause other neurons to fire, or prevent them from firing etc. This is something we know to occur.

In this situation we can say that a person's brain has received information about the object. However, whether or not that information leads to a conscious experience of the object, or otherwise, is not so easy to say. The mere existence of activity caused by a specific object does not guarantee that a person will possess a conscious experience of that object. Many sources are stimulating our senses continuously, yet we are not aware of all these sources, let alone the fact that certain

² I dislike using the term substance, as it implies that conscious experience is comprised of some physical 'stuff'. This is something I would argue is false. But I use it since most alternatives are no better. We are so far from an understanding, or are so completely misunderstanding the problem, that most of our terminology seems inadequate. Once again I direct the reader to Chalmers (*The problem*) account of the problem.

senses are being stimulated at all. The activity of neurons might lead to physical changes in a person, such as the regulation of their internal organs or the activity of their muscles. Yet even if an object were to cause such changes it might still only be classed as a subliminal stimulus: causing activity without any awareness of the object itself (e.g. Bornstein and Pittman, *Perception without*).

On top of that, the person might also remain oblivious to the physical change itself: one can perform complex actions like driving a car, or playing the piano, without any conscious awareness of the specifics of their movements.

Yet, out of all this activity does come a person's conscious experience. What is it about any neural activity that causes it to give rise to conscious experience? Most of the processes occurring in the brain are stimulated by things, and/or are causing changes in a person without any awareness. These are unconscious processes. What is puzzling is that these unconscious processes appear indistinguishable from those other processes involved in conscious experience. They are all the same electrical signals.

Conscious experience, it seems, is not connected with the nature of the signals themselves. Yet there must be some criteria by which they can be separated, something about certain neural activity, or what it does, that will tell us why it leads us to be conscious of specific things at specific times.

Since the stimulus that caused neural activity is not necessarily included in conscious experience and the physical changes that the brain causes are also not themselves necessarily included, it seems we must peer into the brain itself for a solution. When one is having a particular conscious experience, can we see something specific happening in the brain?

One currently popular way to look at this question is to try to look for neural correlates of consciousness (NCC): "*the minimal set of neuronal events and mechanisms jointly sufficient for a specific conscious percept*" (Koch, *The quest* 16)³.

³ Italics in the original.

It is thought, for example, that one needs to excite specific neural circuits in order to give rise to specific conscious experiences. The use of imaging technologies like fMRI lends support to this line of thought. With fMRI we are able to see that specific neural circuits do reliably 'light up' when a person reports possessing a particular conscious experience (Haynes and Rees, *Decoding mental*). We are led to believe that the activity of a particular neuron, or a specific group of neurons, is what constitutes a representation of a thing, and that the firing of these neurons is what leads to our conscious experience of that thing. But this use of NCCs raises a number of objections.

One objection can be found in Cohen and Dennett (*Consciousness cannot*), and their 'perfect experiment'. In brief: the experiment imagines that we separate, for example, the area that correlates with the perception of colour, yet still allow it to function. We imagine presenting the person with an object, a red apple say, and measuring their neural response and their outward behaviour.

Cohen and Dennett imagine the experimenter noticing the neural correlate of 'red' becoming 'active' when the person looks at the apple and concluding that the person has a conscious experience of the apple's redness. Yet, since the area in question is isolated and unable to cause any behavioural change in a person, the subject must emphatically deny that they see this redness in the apple. Who are we to believe?

If a person can't report, remember, make decisions about, plan to act in one way or another because of, and not realise they're having a particular experience when directly probed, then it hardly makes sense to say that they have that conscious experience, such as would be implied if we believed the experimenter with the apple.

Cohen and Dennett's position, therefore, is that it makes no sense to speak of a person having a conscious experience that they cannot access. In the absence of the functional capabilities mentioned above, there is no way we can verify any claim about a person having a conscious experience. Consciousness, they say, cannot be separated from function.

It is of course possible to suggest that the isolated group of neurons is itself having an independent conscious experience of red. And the

rest of the person's brain is having another experience. Individual phenomenal experience could be generated by the firing of specific NCCs e.g. Zeki (*Localization and*).

But this only raises further objections. Firstly, it is a claim that is impossible to verify scientifically (since we rely on a person's report to ascertain what they are experiencing consciously). But more fundamentally, we are left asking whether the group of neurons, before it was isolated, could have an independent conscious experience.

If we say it can have a conscious experience of red in isolation, that the firing of those neurons is what, somehow, 'creates the redness', then surely it and all the other areas of a person's brain can conjure conscious experience separately and independently.

Yet a person experiences a single coherent conscious experience, and we remain wondering how these separate experience producing areas build that. If the different areas of the brain can conjure the stuff of experience, the qualia, independently, it might imply that there is something central to which this is passed onto to create an individual's experience.

We can imagine adding a switch such that we can at once connect and disconnect the isolated brain region. Must we then accept that we can switch on and off a person's conscious experience of the red?

If we do, and accept that the group of neurons in isolation is what creates the particular qualia, we must explain how this qualia happens to be passed onto whatever it is passed onto. How does connecting a group of neurons that generate a qualia, to another group give coherence to the entities conscious experience?

If each brain region can produce and experience the qualia in isolation, why isn't that all they do? Why would connecting them together allow the qualias to be become interlinked and, seemingly, experienced together?⁴

⁴ The notion that we have a single 'stream of consciousness', a single thing that is constructed is, I suspect, entirely false. I do not believe that the brain constructs some sort of 'movie' and my statement here are not meant to endorse such a position. See Blackmore (*There is*), for a challenge to the 'streams of consciousness'.

We know that functions are localised in different brain regions, and that removing or damaging a specific region leads to specific impairment in a person's physical and mental abilities, including their ability to have particular conscious experiences.

Yet the best this can tell us is that the firing of a particular group of neurons is a necessary condition for a person being conscious of a particular sort of thing. But having those neurons fire cannot, on its own, account for our conscious experience. Or, at the very least, there is no convincing account of the how an isolated qualia theory would work.

The existence of any homunculus in the brain, to which information is passed and which is the conscious experiencer, has been widely refuted, notably by Dennett (*Consciousness*). If we do not wish to champion such a homunculus, and we choose to believe that individual elements of phenomenal consciousness are a result of specific, independent neural circuits, we must provide a means by which connecting them allows their experiences to seem shared.

Moreover, proposing that a person experiences a particular thing when that NCC is 'active', for example, does not really offer a satisfying explanation even for the NCC still entirely connected. What we still have is a group of neurons, and electrical signals firing between them. Not only is there still a huge gap between them firing and the conscious experience, the hard problem, we have not offered a way of separating these particular electrical signals from all the other 'unconscious' ones, the 'easy' problem of awareness. The firing of those neurons that make up the NCC may be important for a specific conscious experience, we can see the correlation, but as far as we can see they are doing the same as all the others.

We have no way of saying why they give *this* experience as opposed to *that*. And, as we've already established, any appeal to what stimulated the activity will not suffice. A satisfying account of awareness must tell us something of how we distinguish between neural signals.

If we stick to the NCC, and show that a particular pattern of neural activity is reliably active when a person is aware of *this*, we must go on to explain a connection between that particular pattern and *this*, which must include what is separating that pattern from all the other

neural activity that, presumably, is not currently building a conscious experience.

At the end of their paper, Cohen and Dennett conclude that:

A true scientific theory will say how functions such as attention, working memory and decision making interact and come together to form a conscious experience.
(*Consciousness* 362)

This appeal to functions such as attention is where I begin to differ from them. Attention, as an explanation, is no different from the NCCs described above. Attention is proposed as a specific function that selects one thing for us to be conscious of over another. It picks out of the multitude of neural signals what consciousness is to focus on. Attention, in other words, is supposed to account for awareness.

The concept of attention ties in well with ideas such as the 'global workspace' of Baars (*A cognitive, In the theatre, The global*), where consciousness results from unconscious activity in different brain regions becoming coherent, particularly with respect to frontoparietal and medial temporal cortices.

Or Dennett's (*Consciousness, Are we explaining*) own somewhat similar, idea of 'fame in the brain', or 'political clout'. In these it is suggested that activity in the brain becomes consciously available by harnessing certain cortical resources, or achieving a certain influence in the brain. These sorts of things are what many suggest are driving attention.

But even if we can see that global influence correlates with consciousness we are still left with the task of explaining how neural activity actually relates to the awareness we have of a specific thing. We are ultimately in the same situation as with the NCC.

Look again at the brain and all we see is electrical signals. How do we say they relate to a concept, or an idea? And when the signals spread and influence other areas of the brain, how do they still relate to the same concept? If there are competing representations in the brain we are left asking how the neural activity corresponds to the representation, and how that idea endures as electrical signals dissipate or spread. Then if one of these representations gains political clout, this does not

really tell us what differentiates this activity from other activity that is remains unconscious.

If we suggest that there is competing activity in the brain and that, for whatever reason, some happens to become dominant over large areas of the brain and this is what dictates our present conscious experience, we have to then ask what links that activity, with its global influence, to *that* specific conscious experience.

Proposing a thing is conscious because of particular global influence of activity denies us the ‘perfect experiment’ as an objection, since separating a particular region removes the ability to be influential globally. But as an explanation it is still lacking in a fundamental way. We still only have electrical signals, there is no way to associate them with a particular conscious experience, to say how they correspond to a representation of a particular thing, even after the pattern changes and dissipates.

And if we assume that the pattern of neural activity, somehow, does constitute a representation of the object, we still need to know what difference its global influence has on it that allows it to become conscious experience. Globally influential neural activity remains neural activity, why should it dictate what we are consciously aware of above all the other neural processes? The same challenge must also be offered to any proposal based on, say, gamma synchrony in the brain e.g. Hameroff (*The “conscious pilot”*) or similar ideas.

If we say that, by virtue of this process (gamma synchrony, global influence or whatever else) a thing becomes part of conscious experience, we have to have some way of associating that specific activity with that specific experience. We need a way to separate out neural activity between the conscious and unconscious.

Showing the correlation between the activity of some neural circuit or process and some specific conscious experience will not be enough; a satisfying account needs to give an explanation that goes beyond the mere experimental observations of their coincidence to say something about the nature of the neural signals or what they are doing.

If we propose attention is what separates neural activity into the consciously experienced from the unconscious, the thing that, say,

makes me aware of my heart beating at sometimes but generally leaves me blissfully unaware, we are left with explaining what attention is selecting between, as well as what exactly attention itself is.

If we think working memory is involved, we need to understand what that is, how exactly a group of neural signals equates to a memory. In what follows I propose to simplify this process of awareness by cutting out the middle men: attention and its allies.

Instead, I argue that those things can be completely understood in terms of behaviour, and that conscious awareness, from which a specific conscious experience results, can be readily constructed out of unconscious neural process by considering behaviour alone.

A role for behaviour

An immense number of ideas have been proposed in full, or part explanation of the various concepts surrounding consciousness. These range from the conventional to the bizarre, we find ideas that are spiritual and religious, and ideas that are wholly material and scientific. We might invoke string theory or quantum mechanics (like Penrose (*Shadows of*), or Stapp (*Mindful universe*)); some as yet unknown fundamental physics could be postulated, perhaps supporting a form of panpsychism like that of Skrbina (*Panpsychism in*).

We can look into the detail of how the brain operates in the hope of finding something unique. To provide and account of the structure of awareness, I propose to take the one thing we know the brain to do with absolute certainty: produce physical, behavioural changes in a person.

Before beginning my own account, a number of clarifications are necessary. My use of the term behaviour, as already hinted, refers to all the physical changes in a person that result from neural activity. This is the aforementioned stimulation of muscles, regulation of internal organs, secretion of hormones etc. All of these things work to alter what an organism does in its present environment and so we refer to them as behavioural changes.

Secondly, I am not going to suggest that the actual performance of behaviour is necessary for consciousness. Any interdependence

between the actual physical bodily change of a behaviour and consciousness is demonstrably false. People with locked in syndrome, for example, can be conscious of things without the ability to physically enact behaviours (see e.g. Owen et al. *Detecting awareness*).

What is going to be suggested, however, is that any conscious experience can only sensibly be considered in terms of behaviour. Imagining an action, for example, excites the same neural circuitry as its actual performance (e.g. Kuhtz-Buschbeck et al. *Effector-independent*).

Meaning that neural activity, presently and subsequently occurring can still be influenced by it *as if* the behavioural change did occur. Whether or not behaviour is physically enacted needn't matter, neural activity can be said to correspond to certain behavioural changes even without them occurring. The activity associated with an 'internal thought' of an act has been experimentally shown to be the same as the acts actual performance. Its correspondence to behavioural changes is what, I intend to argue, separates neural activity into conscious experiences and unconscious processes.

Seeing that activity is occurring, we don't simply consider that it is electrical signals; we consider it in terms of certain physical changes it corresponds to. We might see the necessity of, for example, the activity of certain grid cells in allowing a person to 'know' their location in a particular space, and so have conscious awareness of their being in that particular position (see Moser, *Place cells*). But it is not simply the firing of the neurons that 'is' that awareness, the awareness comes from the fact that the firing of that particular pattern of neurons corresponds to certain behavioural changes, or directly promotes other activity that corresponds to those changes, and it is that 'behaviour' that constitutes awareness.

There are two reasons we can argue for the role of behaviour in conscious awareness: firstly is the consequences of removing the ability to perform certain behaviours (or removing the fact that certain neural activity corresponds to them), and second is the consequences of having a person perform a specific behaviour (or having a person's neural activity correspond to certain behaviours). We will consider them in turn.

First, like in the perfect experiment previously described, we can ask whether stripping away the ability of a person to express that they

are having some experience (or some behaviour related to having the experience) implies that they cannot have it. Consider the relationship between pain and pain behaviour⁵. Is it possible for a person to be in pain without any related behaviour?

Imagine that a person can have pain experiences whilst their neural activity does not, and in future cannot, correspond to any sort of behaviour that relates to that pain. Pain might be like a disease and the behaviour the symptoms.

Without any behaviours associated with pain, we would have to imagine that the person we are observing conducts their life without the ability to ever display any behaviour related to that pain. One could not speak of it, be hindered in their movement by it, decide to act because of it etc. But to have an experience of pain, a person must also be aware that they have pain (this to me seems to be true by definition: what we are conscious of, and what forms part of our conscious experience, is what we are aware of). But to say that I am aware that I am in pain, yet have this awareness unable to influence any possible behaviour, seems to be a contradiction.

If there is no possibility for the neural activity that is 'causing' the conscious experience of pain to correspond to, or cause, certain specific physical changes related to that experience, then to suggest that a person still has that experience leaves one in the same situation as the experimenter and his apple.

Would any sensible experimenter claim that a person is in pain, after measuring their neural activity, whilst the person themselves carries out all the activity of their lives without any possibility of displaying behaviour related to this pain? Including the ability to say that they are in pain when asked? (And this is for a person otherwise perfectly capable of expressing themselves through speech). The disease can be separate from the symptoms in the sense that a person can have a disease without awareness of it. But with phenomenal consciousness, surely the experience and awareness must be tied?

If one has a disease that affects them only subtly, such that it influences what they do, yet leaves them unaware of the changes, then it must

⁵ A thorough examination of this subject is provided in Hickman (*Is it Intelligible*). Her conclusion is, like mine, that they cannot be separated.

be thought of like a subliminal stimulus, and one is hardly conscious of that. To have a conscious experience, such as pain, subliminally is senseless. And to suggest one has a full-blown conscious experience, such as pain, without the possibility for this to alter *any* behaviour is also senseless.

Any behaviour includes the ability to report, remember, make decisions about, plan to act in one way or another because of, and realise you're having a particular experience when directly probed. Minus all of these things, one must be left with a very bizarre view of experience. Awareness implies the ability to behave in a particular way, and conscious experience implies awareness.

A similar argument can be presented from the opposite direction: that if a person, were able to express certain behaviours then they would necessarily be aware of certain things. If the person in the perfect experiment said "yes I see the apples redness", if they reported (with sincerity) its colour to be red, if they would later recall having seen the apples redness and could identify this colour from a chart, if they were able to distinguish its colour from others and say it is the same as another 'red', if they made use of its colour to judge its edibility etc. then it hardly seems fair to suggest that they have no conscious awareness of it (and, also assuming that they are not a philosophical zombie, this implies that they would also have a conscious experience of it).

If I can verbalise the existence of the object in the room, then I must necessarily be aware, to some extent, of its existence in the room. Which of its properties I am aware of is unclear, but if I speak of it explicitly one doesn't imagine that I have no real conscious experience of it. It can no longer be a subliminal stimulus, affecting me unconsciously, if I display certain behaviours.

Thus if we take away all possible behaviours, it is difficult to argue that a person is aware of a thing and so having a conscious experience of it, and if we introduce specific behaviours we are left in a position where we must conclude that a person does have awareness and thus experience. Having your behaviour influenced by a thing does not imply your awareness of it, but simply displaying certain specific behaviours, in relation to a thing, does. From here we can suggest something about the role of behaviour in constructing awareness.

Conscious experience from unconscious processes

Rather than look to promote something like a specific process of 'attention' as choosing what we are consciously aware of, and so experiencing, it is simpler to discard it and see the process entirely in terms of behaviour. Let us take an example. A person possesses a body and is at times aware of that body. A person is never, however, aware of their entire body. My attention, at times, may be focussed on my hand (I am aware of where it is and what it is doing), but at the same time I am not aware of my foot, although my foot may be doing things (like helping me walk down the street).

At another time my focus is shifted and I am aware of my foot and not my hand. The question is what causes my awareness at different times, or more fundamentally: what is my awareness.

Previously I argued that it makes little sense for a person to be consciously aware of a specific object yet for their neural activity never to allow any form of behaviour that would demonstrate that awareness. So if the mind, and conscious awareness, is a product of neural activity, and neural activity must *correspond* to certain behaviours for a person to have awareness of a specific thing, can't we suggest that it is the fact of having activity that corresponds to specific behaviours that accounts for our awareness of a specific thing?

In other words, I would not say I am aware of the position of my hand because my brain has constructed a model of my body and its position in space, and because 'attention' has selectively decided to make me aware of it rather than my foot. I say that I am aware of the position of my hand because my neural activity happens at that moment to correspond to behaviours that constitute awareness of my hand's position⁶.

When I am consciously aware that my hand is resting on the arm of my chair, and not on the desk in front of me, it is because my neural activity corresponds to sets of behaviours that would be appropriate to its being in that location. (Once again I must stress that the actual

⁶What, specifically, those behaviours need to be is a question I leave open. I have argued that in the absence of certain behavioural abilities (or a brain than can have neural activity that corresponds to such abilities) it seems that one cannot be conscious of certain things, but identifying specifics is a subject that would require much more detailed considerations than this paper allows.

performance of the behaviours would not be necessary). In other words we could say that the neural activity that constitutes my awareness of the hands position, so constitutes this, and not some other thing, by virtue of their relation to those particular expressible behaviours.

In the famous rubber hand illusion, a person is tricked into experiencing their hand (that is all sensations related to it) as occurring in the same position as a rubber hand placed nearby, rather than coincident with the location of their real hand (Botvinick and Cohen, *Rubber hand*).

One can even trick a person into experiencing any random object as being their hand! One could suggest that one's brain has constructed the model and projects their experience of their hand to a particular point in space, and that the experiment tricks it into projecting the experience elsewhere. To my mind this explanation is overly complicated.

If we take a knife and attempt to stab the rubber hand, a person will show the same physiological response that they would if their real hand was so attacked, a response that does not occur when some unrelated object is threatened (Armel and Ramachandran, *Projecting sensations*).

But if they did not exhibit such behaviour, if their neural activity did not correspond to any behavioural changes in keeping with their hand being in the position of the rubber one, then we could not sensibly say that they experience it in that place. They themselves would not know that their hand was in a particular position if they couldn't possibly behaviourally respond to its being in that position. If my neural activity, on observing the rubber hand, entirely corresponded to the same range of behaviours as it does to another inanimate object, then I couldn't possibly also experience that as my hand.

Our awareness of the position of ourselves in relation to other objects, and of the relative positions of other objects, is necessarily accompanied by behaviour in keeping with its being so. We are only aware, and can experience, a thing as 'over there' if we can and/or do behave in appropriate ways to its being so.

The simpler explanation, again, takes the fact that our neural activity happens to correspond to certain behavioural changes as being central to what we are aware of and thus what we consciously experience.

As a further example, the reason I am generally unaware of my heart beating or my breathing, even though they are products of neural activity just like what I am conscious of, is because the behavioural change itself is what helps build my conscious experience.

I am not aware of my arm because I move my arm, I am aware of it when my behaviour constitutes awareness of this, which may only partly be a result of the specific behaviour that is moving the arm.

The neural activity that is controlling my heartbeat may contribute to my awareness of ‘something’⁷, but the fact that it causes *this* behavioural change needn’t give it any connection to my awareness of *this*. Certainly, my heart needs to beat for me to be aware of it! But its beating doesn’t constitute this awareness.

At certain, other, times I am able to count the beats and verbalise this or conduct other movements in time with its beating. It is then that I might be said to be aware of its beating, and I am so aware because I can, at that time, enact those behaviours. The extent of my awareness, the detail of the awareness, is dictated by the specific behaviours that my cognitive faculties manage to produce.

In the original example of an object in the room (with light reflecting from it into a person’s eye) and given the scheme I have sketched out, we no longer need to ask anything of the brain other than that it processes those electrical signals, and that those correspond to certain physical changes in a person: something we know it is already doing. There is nothing extra to add, it just corresponds to behavioural changes.

Neural activity causes us to act in different ways and be aware of different things, and the nature of what we are specifically aware of is dependent on the specifics of what behavioural changes our present neural activity constitutes. We suddenly become aware of the object in the room, or of our hand, or of ourselves, because, given whatever stimuli we have received, and given the ways our own brain processes those signals, we end up with activity corresponding to behaviour that

⁷ Changes in heart rate do play a role in, for example, the regulation of a person’s emotions (e.g. Kalat and Shiota *Emotion*). And our emotional state is something which we are generally aware of, or contributes to our awareness of some other thing. Thus, this particular behaviour, the heart rate, could be said to help construct our awareness of something via its role in constructing an emotional state.

constitutes (or perhaps a better phrase would be 'is in keeping with') awareness of 'this' and not 'that'.

Summary and conclusions

In this paper I have attempted a brief sketch of how we could understand the dependence of conscious awareness with behaviour, the physical changes in a person that neural activity corresponds to. This, I believe, is the simplest way to reify conscious awareness in bodily function. With this description we do not ask anything more of the brain than what we know it to do with certainty.

We know that information about the world is encoded into electrical signals. These are passed around the brain, stimulating patterns of activity in the neurons. It is generally accepted that our conscious experience is a result of this activity, which the brain somehow represents a thing in its activity and thus leads to what we experience.

My suggestion is that we understand this representation in terms of behaviour. I suggest that we look to what behaviours neural activity corresponds to in order to account for awareness, and so distinguish between unconscious processes and conscious experience.

In other words, awareness is to be understood in terms of behaviour. We represent the world based on expressible behaviour (even if we cannot, or do not, actually express it). Now, instead of asking whether or not conscious thoughts cause behaviour (like Baumeister, Masicampo and Vohs, *Do conscious*), we can suggest that conscious thought is, effectively, constructed out of behaviour.

A fuller development of the relationship between specific behaviours and awareness of specific things needs further work. But, if we think in terms of expressible behaviour, we can approach various aspects of consciousness by asking what disallowing certain behaviours will do to what we can be aware of.

We might, for example, attempt to give an account of our awareness of ourselves by asking what behaviours we would need to take away before we can no longer sensibly say we are self-aware. For example, if we remove certain language abilities, would it still make sense to be

aware of oneself? An account in terms of behaviour, if correct, provides us with a convenient means of approaching these various aspects.

However, this description is only a sketch. If correct, we can show that a person's conscious awareness only makes sense in terms of behaviour, but we must acknowledge that behaviour itself does not provide an explanation for the substance of conscious experience.

The experience and the awareness coincide, yet seem to be so separate. We might bring out our philosophical zombie, with all the behaviours but without the experience, as an example of that (Chalmers, *The conscious*).

Yet we can also see that the experience that we do have *is* tied to behaviour. Perhaps this realisation can provide some help in constructing a satisfying account of conscious experience, or perhaps that explanation will forever remain inaccessible.

A non-reductive explanation may be called for (as, again, with Chalmers (*The problem*)), but if we consider my account correct we must factor in why experience would be dependent on neural activity's relationship with expressible behaviour.

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