Rev.Phil.Psych.
https://doi.org/10.1007/s13164-019-00436-x

Phenomenal Overflow, Bodily Affect, and some Varieties of Access

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Published online: 20 March 2019

Abstract
The phenomenal overflow thesis states that the content of phenomenally conscious mental states can exceed our capacities of cognitive access. Much of the philosophical and scientific debate about the phenomenal overflow thesis has been focused on vision, attention, and verbal report. My view is that we feel things in our bodies that we don't always process with the resources of cognitive access. Thinking about the question of phenomenal overflow from the perspective of embodied affect rather than the content of visual experience is the novel contribution of this paper. I argue that we have reason to think that hydranencephalic children are phenomenally conscious but incapable of cognitive access. Further, I claim that we should interpret the reactive behavior of these subjects in terms of a kind of access to content that is distinct from cognitive access, I call this novel form of access 'affective access.'

1 Introduction

The phenomenal overflow thesis claims that we have experiences that either cannot be used, or at least are not being used, by working memory, and do not serve as input for intentional action, inference, and speech (Block 1995).[1] Much of the philosophical and scientific debate about the phenomenal overflow thesis has focused on visual perception, attention, and verbal report (Sperling 1960; Block 2007). There is much to learn about attention and consciousness from these discussions, but the question of phenomenal overflow remains unresolved. In this paper, I will consider alternative evidence that provides good reason for endorsing a version of the overflow thesis.

[1]Philosophers tend to be of the view that explaining phenomenal consciousness constitutes a particularly difficult philosophical project, while explaining cognitive access is decidedly less difficult (Chalmers 1996). Thus, discussion of the relation between phenomenal consciousness and access consciousness is thought by some to be germane to explaining the hard problem by analyzing phenomenal consciousness in terms of access consciousness (e.g. Prinz 2011).

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I argue that we feel things in our bodies that we don't always process with the resources of cognitive access. Thinking about phenomenal overflow from the perspective of embodied affect rather than visual experience is the novel contribution of this paper. This version of the thesis has some benefits that the more common approach lacks. Proponents of the phenomenal overflow thesis who rely on the psychology of attention for evidence tend to find themselves committed to 'the nomological dangler' conception of consciousness (Smart 1959). This is the view that the phenomenal character of experience has nothing to do with the functions of the mind. Consciousness in this way merely 'dangles' as a conceptual outlier amidst the smooth operations of an otherwise non-experiential system. This conception of consciousness is problematic because it violates basic intuitions we have about the fact that it is in virtue of being conscious of the world that we can come to know things about it and act on the basis of that knowledge (Clark and Kiverstein 2007; Campbell 2002, 2004). My approach does not violate this intuition. I focus on the way in which experience is connected to the capacity of organisms to be hedonically perturbed by their environments.

I present this argument by considering the special case of hydranencephalic children, patients who were born without a functioning cortex. I argue that these subjects have phenomenal consciousness but no cognitive access.[2] I argue that that these subjects have something called 'affective access', the details of which I will explain below. Here is a breakdown of my argument, which I call 'The Affective Overflow Argument':[3]

AO1. Hydranencephalic patients are phenomenally conscious.
AO2. Hydranencephalic patients do not have access consciousness.
AO-C1. Phenomenal consciousness is not constituted by access consciousness.
AO3. Hydranencephalic patients have access-like functioning that is grounded not in cognition but in primordial affect.
AO4. If hydranencephalic patients have access-like functioning that is grounded not in cognition but in primordial affect, then phenomenal consciousness does not overflow this affectively grounded access (which I call 'affective access').
AO-C2. Phenomenal consciousness does not overflow this affectively grounded access (which I call 'affective access').

In §2, I define key terms and explain why I think that the usual way this debate is carried out needs supplementing. I will provide reasons for endorsing my argument up until the first conclusion (AO-C1) in §3. In §4 I consider two important objections in order to complete my argument. I then close with some brief conclusions.

[2] I use the terms 'cognitive access' and 'access consciousness' synonymously.
[3] In calling this argument the 'Affective Overflow Argument' I am going to claim that our capacity for bodily affect overflows our capacities for cognitive access. However, it will turn out that our capacity to be hedonically affected through embodied experience constitutes its own kind of access to phenomenally conscious content.

2 Perceptual Psychology and Overflow

In §2.1, I set out some definitions and conceptual clarifications. I then analyze an argument for phenomenal overflow offered by Ned Block (2007) and briefly examine one important line of criticism of Block's approach (both in §2.2).[4] It is from here that I will draw some motivation to consider alternative empirical evidence and offer my positive proposal (in §3).

2.1 Definitional Preliminaries

By 'phenomenal consciousness' I refer to those mental states for which there is something it is like to have them (Nagel 1974).[5] When I have a phenomenally conscious visual perception of an apple, there is something it is like for me, as a subject of experience, to see the apple, for it to seem a certain way to me; red, shiny, and possibly delicious. I then think to myself, <I am hungry, I should eat that apple>. Turning to you, I say, 'Gosh, that apple looks delicious, I think will eat it'. Finally, I walk over to the fruit bowl, take a bite of the apple and continue our previous conversation. In response to my experience of the apple as seeming red, shiny, and delicious, I have done three things. I have engaged in an inference, I have generated an intentional remark, and I have executed an intentional action guided by the imperative embedded in my inference. In short, I have cognitively accessed the content of my visual perception to generate various behaviors. More formally, a mental state *M* is access conscious if *M*'s content, in virtue of being represented by subject *S,* is one or all of the following: poised for use as a premise in an inference, poised for use in the rational control of action, or poised for the rational control of speech (Block 1995, 231).

This definition is complicated by the fact that there are many different psychological processes that count as cognitive access. Common terms used to describe access conscious processes include, 'attention', 'introspection', 'awareness', and 'report' (Block 2007). It's not clear that these are all species of a single genus. One way to conceptually unify cognitive access is to think about it in terms of an executive system in the brain. Each psychological predicate for access is a token of a type of functional process in the cortex.

The global-workspace theory of consciousness is an empirical framework based on this idea (Baars 1997). The theory is a functional one and therefore, the workspace it posits as a model of the mind, is multiply realizable. However, most of the empirical research that utilizes this theory has focused on the cortical system as the primary realizer of consciousness. On this view, a visual mental state *V* is access conscious if its content is represented by an information processing system that involves, "...large-scale re-entrant interaction between posterior visual cortex and frontoparieital regions" (Shanahan and Baars 2007, 525). This cortical network is called a 'workspace' because it integrates signals from all over the brain – in particular, from the sensory cortices –

[4] To be clear, my purpose here is not to be exhaustive in my assessment of the phenomenal overflow debate. This debate has many contours and I cannot hope to treat of all of them here. Instead, I focus on one productive exchange that I think represents some of the dialectical entrenchment, in just enough detail to motivate my positive proposal (Cohen and Dennett 2011). For more details on other avenues of criticism, see the extensive commentaries to Block's (2007) target article.

[5] I will also use the term 'experience' to refer to such mental states, events, and processes (Soteriou 2013).

and then recruits those areas into even more extended networks of activation. The notion of 'broadcasting' captures the idea that if a pattern of neural activation of whatever sort, "...is propagated by this white matter infrastructure [in the cortex], and thereby comes to exercise widespread influence in the brain" (ibid), then it is access conscious. The question of overflow is whether or not we can have any experience outside of our capacities for this kind of global integration of information.[6]

Finally, I want to make it clear at the outset what my commitments are regarding my use of terms like 'grounding', 'dependence', and 'realization' in connection with notions of 'consciousness', 'access', and the interactive capabilities of hydranencephalic subjects (see §3). When I talk of the 'dependence' of an hydranencephalic patient on their primary caregiver I mean that the reassuring presence of that caregiver is a necessary condition for the phenomenally conscious experience of that hydranencephalic subject.[7] When I talk about 'grounding' and 'realization,' these are metaphysically agnostic catch-all terms that are meant to address but not resolve the question of the causal connection between physical and functional states of an organism on the one hand, and the experiences of subjects on the other. I make no claim about whether experiences are identical with their physical and functional realizers. I assume a causal connection between them but I do not claim to be solving the hard problem of consciousness (Chalmers 1996).

2.2 The Sperling Paradigm and its Discontents

The evidence often cited in support of the phenomenal overflow thesis comes from the Sperling partial report experiments (Sperling 1960; Block 2007). In such cases subjects are shown three rows of four alphanumerical characters for 50 ms. This is followed by a blank field. Subjects report that during the 50 ms exposure interval they can see all twelve characters. When asked to specify which characters were seen, subjects can report the specific identities of an average of four characters. In different cases, there are priming signals given, either visual or auditory, to cue the subject's attention to one of the rows of the alphanumeric array. When asked to report on the identities of the characters after being presented with the full array and then cued, the four-character average persists in terms of reporting, but the report is specific to the row that was cued (Block 2007, 487).

[6] I distinguish two versions of the overflow thesis. The strong version of the thesis claims there are phenomenally conscious mental states that are in principle cognitively inaccessible. The moderate version states that it might be the case that the contents of all phenomenally conscious states are in principle *accessible* but are often not *accessed*. When experiencing mild discomfort from sitting too long, I *might* start attending to that pain but I do not do so. In this way my pain is accessible but not accessed. In ordinary cases, it makes sense to speak of overflow only in terms of the moderate version of the overflow thesis. In the special cases I will consider in §3, the stronger version of the thesis will be relevant.

[7] This claim is derived from the fact that without the presence of these caregivers, the hydranencephalic subject's capacity to interact with the world degrades severely to the point of complete non-responsiveness (see §3). It is conceivable that such non-responsive subjects might be phenomenally conscious though not offering evidence of this through their behavior. This might be true of patients with locked-in syndrome or those who suffer from absence seizures. However, I doubt the same can be said of the hydranencephalic subjects we will be considering here. This is because in these special cases, subjects have no functioning cortical network to help modulate the lower brain and body states that would otherwise be sufficient to realize experience without the help of the caregiver's support. For more on this, see Bayne (2011) and Bernat (2006).

Block's interpretation of these results is that we have a phenomenally conscious perception of the individual identities of the twelve different alphanumerical characters during the 50 ms window and that only four of those characters are cognitively accessed by being broadcast in the global workspace. The content of our phenomenally conscious visual perception of the characters overflows our cognitive access to them. The motivation for this view stems from the fact that during cueing, any of the characters of the full array seem in principle reportable even though only three or four such characters are in fact reported. Which characters are reported depends on the location of the post-exposure cuing. Thus, this experiment provides behavioral data that supports the common-sense motivational thrust for the phenomenal overflow thesis; we experience much more than we are capable of engaging with explicitly or intentionally.

Many philosophers have been at great pains to deny the overflow thesis.[8] For example, Cohen and Dennett (2011) argue that subjects do have cognitive access to the unreported figures but their access is limited to knowing *that* one has seen those figures. On this interpretation, the Sperling results are consistent with the idea that there are degrees of access and degrees of access do not commit us to endorsing the phenomenal overflow thesis. The sense of seeing all of the characters during the 50 ms interval is a result of cognitive resources, in this case, attention, being distributed. Because the subject's capacities for cognitive access are so distributed, the subject is not able to process the image with a sufficiently high resolution for reportable recognition of individual identities (Cohen and Dennett 2011, 359–60). Nevertheless, in both cases (initial exposure and subsequent report), there is *some* access in play. If there is always some access in play, then there is no overflow.

This objection proceeds by pointing out that subjects can report only the *individual* identities of four figures during the report task. This lack of capacity to report more than around four individual identities of the figures in the post-cue phase of the experiment must be understood alongside the fact that subjects *can* report that they saw twelve figures during initial exposure. In both the initial exposure and subsequent report there is *some* access in play. The difference between initial exposure and subsequent individual identity report is one of degree. Access consciousness is present in both cases. If cognitive access is present in all cases, then the motivation this evidence purports to provide for the phenomenal overflow thesis evaporates. The conclusion plainly follows that there is no phenomenal overflow in Sperling-type cases.

Is the case for phenomenal overflow clearly refuted by the above counterargument? If so, then the proponent of the phenomenal overflow thesis needs to find alternative evidence (see §3). I think the situation is more complex. Block, or someone sympathetic to his interpretation of the evidence, might respond to Cohen and Dennett (2011) by pointing out that our experiences stay with us for some time in a 'visual phenomenal

[8] One of the reasons for this is because they see cognitive access as something that is straightforwardly reducible to the physical and functional properties of the organism, and these philosophers maintain that phenomenal consciousness can itself be reductively explained in terms of access consciousness. If it turns out that phenomenal consciousness and access consciousness are two different sorts of consciousness that operate in parallel, then this reductive strategy will fail.This is not the only reductive strategy, however. Block (1995; 2003) favors an identity view that is reminiscent of Smart (1959). On this view, phenomenal properties are type-identical with physical properties in the brain. The problem with this view is that the identity is informative but not theoretically robust. Thus, the physical nature of phenomenal consciousness is a basic fact, but not one that can be explained in terms of the kinds of information processing narratives that explain the functions of cognitive access.

memory system' (Block 2007, 489) and that our general capacity to report that we have seen 'some characters' is just the post-facto report of what we experience. During exposure we experience something that we do not cognitively access, it is only later when asked to do so that we explicitly report the content of our experience. Therefore, we still have overflow in this case. Further, it might be argued that the coarse-grained nature of the report abilities embodied in the initial response to the grid are less rich than the experience itself. Even if there is some cognitive access present during the experience of the grid, it is of a different level or degree than the vivid richness of the experience itself. This difference in grain is sufficient to maintain that overflow is happening in such cases. Adjudicating these disputes is difficult because both interpretations are consistent with the available evidence. Both views have a coherent explanation as to why subjects can only partially report the individual identities of a limited number of the characters.

More importantly, in this paradigm the emphasis is on visual perception and verbal report. I hypothesize that at least part of the problem lies here. Analyzing the phenomenal character of experience — in these cases, visual experience — with experimental protocols where insight into what it is like to see is mediated by cognitive access, makes it difficult to escape the explanatory circle between verbal report and phenomenally conscious states. All evidence cited in support of overflow is reported by subjects with the tools of cognitive access. This is part of what motivates critics of the overflow thesis. In conclusion, either the phenomenal overflow proponent needs to find alternative evidence or the dialectic is itself entrenched in a way that requires we look elsewhere to resolve the impasse.

3 Alternative Evidence for the Overflow Thesis

By looking at behavioral data coming out of affective neuroscience, we can get more traction on the question of whether phenomenal consciousness overflows cognitive access. In this section, I consider cases of hydranencephaly in human children and argue that these cases provide good reason to endorse a version of the phenomenal overflow thesis. The version of the overflow thesis I will endorse is established on the basis of two claims. The first is that it is clear that the cases I am about to canvas are ones in which the subjects are phenomenally conscious (AO1). The second is that their cognitive architecture is sufficiently impaired by their disease that they cannot be said to have cognitive access to the contents of their experiences (AO2).

3.1 Some Hydranencephalic Children Are Phenomenally Conscious

Hydranencephaly is a disorder where some human beings and animals are born without either cerebral hemisphere. The cranial cavity where the cortical cap would be is instead filled with cerebrospinal fluid. In the absence of such a major piece of neurophysiology, such individuals possess no functioning cortical network, and perhaps no global workspace.[9]

[9] This disorder should be understood in contrast with a closely related disorder *anencephaly*. This latter disorder is the same as the first except that there is no cerebrospinal fluid to fill the cranial cavity. Most parents are told that children with anencephaly will perish in utero or very soon after delivery. In a study of 211 pregnancies where there was prenatal diagnosis of anencephaly, 20% of those fetuses were stillborn, 72% were carried to term but died within 24 h, while six of those 211 survived six or more days (Jaquier et al. 2006).

In some cases of hydranencephaly, the children survived for several years and showed strong behavioral evidence of a rich affective life. It is on the basis of this novel behavioral evidence that we should conclude that these children have phenomenal consciousness. Consider that: "[I]n the setting of the home environment upon which these medically fragile children are crucially dependent, they give proof of being not only awake, but of the kind of responsiveness to their surroundings that qualifies as conscious by the criteria of ordinary neurological examination" (Merker 2007, 79). The original study that Merker is referring to was carried out by affective neuroscientists and physicians at UCLA, Harvard University, and the Medical College of Ohio (Shewmon et al. 1999). They interacted extensively with a number of hydranencephalic children who were adopted by a nurse at a local hospital. Each case had unique details that I cannot canvas here. What is important is the structurally invariant features of their conditions. I focus on two such features.

First, all of the children developed a kind of affective compensation for loss of cognitive function. Specifically, "...decorticate children are extremely sensitive to changes in routine and environment. They are easily disturbed by rides to the doctor's offices and by strange people and surroundings, in such settings they often involute and fail to manifest any cognitive functions that parents might report" (Shewmon et al. 1999, 372). Part of this affective irritability derives from the fact that such children begin life in a state of high agitation which only calms into a more relaxed affective state with the establishing of routine, comfort, and affection (Shewmon et al. 1999, 366). This high degree of agitation is due in part to extreme physical atrophy, probably due to the lack of a motor-cortex, which allows for the proper development of the capacity to move under command.

Second, only once sustained affective relations and physical comfort are established are more stable patterns of interpersonal interaction and differential preferences established. Touch and sound are essential in this regard. At age 10, one subject had to go to the hospital because of an upper-airway obstruction. His mother accompanied him in the ambulance where, "..as long as he [the patient,] heard her reassuring voice and felt her caresses, his oxygen saturation remained tenuously stable, but whenever she stopped, it quickly deteriorated" (Shewmon et al. 1999, 370). In this case, something as physiologically basic as the ease of breathing is profoundly affected by the familiar touch and soothing voice of a caregiver. Without such a reassuring context, in many cases, such subjects become unresponsive to any interactions. For example, the same child was unresponsive to attempts by one of the study's authors at gentle vocal and tactile interaction. I suggest that we take these results to show that hydranencephalic subjects are able to live radically care-dependent, but nonetheless rich, phenomenally conscious lives, in the absence of a cortically realized global workspace. This gives us some initial reasons to conclude that hydranencephalic patients are phenomenally conscious (AO1).[10]

So far I have focused on the extent to which these patients are cognitively deficient and caretaker dependent. However, it is arguably more important to focus on the positive capacities these subjects enjoy to further convince the sceptic of the richness of their phenomenal lives. Most children who are born with this disease die very young,

[10] Whether or not the absence of a cortical workspace amounts to the absence of cognitive access remains to be seen. Below I will argue that it does.

usually within months of being born. However, many of the children in this study lived well into their teens. The main difference between these two sorts of cases is that typically children with this disease are not treated like people. They are treated like subjects in a persistent vegetative state (VS, for more see §3.2) and very quickly after birth they tend to die. However, when they are cared for, touched, spoken to, in a word, loved, these children can grow and flourish. They come to express palpable emotional affects that are differentially sensitive and partial to their primary caregiver. They respond with happiness when certain kinds of music are played, they become distraught when their caretaker is absent for an extended period of time. They calm down when this person returns and touches them in a familiar way.

These subjects cannot verbally report and it is true that verbal report is the hallmark of consciousness attribution in the laboratory setting. I am happy to grant that it is a sufficient condition, but report cannot be a necessary condition. To deny the capacity of experiencing pleasure and pain, in a word, affectively phenomenally conscious experience, to these subjects is inaccurate. Look no further to the result of *not* treating them as if they were experience-having persons; it is plausible this is the main reason so many of these patients die so young. I therefore conclude that such subjects are enjoying phenomenally conscious lives. Further, there is a certain affective relational structure that is necessary to realize experience in these special cases. Without a positive affective tone on the side of the patient — sustained by the dynamic feedback from the trusted caregiver — these patients become completely vegetative (VS).

3.2 Hydranencephaly as a Global Disorder of Consciousness

Having provided some initial motivation for the claim that some hydranencephalic children are phenomenally conscious (AO1), I need to situate my interpretation of these cases within the hub of literature focused on Global Disorders of Consciousness (GDC) (Bayne and Hohwy 2014).This contextualization will provide some necessary conceptual architecture for interpreting these special cases and for dealing with some objections that will be addressed below (§4).

We can begin to home in on a definition of a GDC through a relevant contrast class: "Global disorders of consciousness can be contrasted with *focal* disorders of consciousness in which only a particular kind of conscious content is disturbed" (Bayne and Hohwy 2014, 130). For example, visual impairments like unilateral neglect result in the extinction or degradation of visual content in an isolated section of the visual field. Such impairments constitute a focal disorder of consciousness because a subject's consciousness is compromised partially in terms of their limited experience of modally specific content. By contrast, GDC are those that exercise a holistic impairment over a subjects capacity to interact with and experience their environment, regardless what token state they might be in at a given time. Unlike token conscious mental states, which can be individuated on the basis of their content, the holistic nature of GDC precludes such an individuation criterion: "The chief puzzles posed by specific conscious states concern how their phenomenal character can be explained in terms of their neurofunctional and representational properties. By contrast, the challenges posed by conscious modes concern their very identification." (Bayne and Hohwy 2016, 58). Nevertheless, we can start to get a bit more precise about GDC by thinking about the manner in which a subject is able to engage with the content of their experiences.

Philosophers and scientists have variously referred to this global aspect of consciousness as its mode or level.[11] One preliminary way of thinking about a mode or level of consciousness is in terms of the range of contents that a subject has phenomenal access to through experience and the degree of behavioral control that is available to that subject on the basis of that experience (Bayne and Hohwy 2014, 131). However, one problem with this initial approach is that it seems to entail that consciousness comes in degrees, that one subject can be *more* conscious than another. However, this kind of graded thinking runs afoul of the following objection, following Nagel (1974): "According to the standard conception of consciousness, a creature is conscious if and only if it possesses a subjective point of view. Arguably, the property of having a subjective point of view is not gradable-it cannot come in degrees…One person can be conscious of more objects and properties than another person, but to be conscious of more is not to be more conscious" (Bayne, Hohwy, and Owen 2016, 407). Thus, we need an account of the mode (in contrast with the content) of conscious experience that is a bit more fine-grained. This will go some way in helping to further my desired interpretation of the hydranencephalic cases we have been considering.

Bayne and Hohwy (2016) outline a tripartite account of how to individuate modes of consciousness, of which GDC are an important, if atypical subspecies. The three ways of individuating a modal profile of a subject's consciousness are content-gating, temporal and attentional structuring, and functional integration. Content-gating is the idea that a subject's global mode of consciousness can be individuated on the basis of the fineness of grain and types of properties and objects that the subject is able to experience. Ordinary subjects in a waking state are normally able to perceive the categorical properties of objects – i.e. they are able to see objects *as* the kinds of objects they are – and to form judgments and beliefs on the basis of those perceptions. By contrast, many subjects who suffer from GDC – and the hydranencephalic subjects we have been considering here would certainly fall under this designation – are only able to perceive low-level sensory properties while having basic affective responses to their environment (Bayne et al. 2016, 409). A second means by which we might individuate global modes of consciousness is by the temporal and attentional structure of the contents of a subject's experience (Watzl 2011). In ordinary cases, there is a fairly marked distinction between focal attention and peripheral awareness (bracketing for the moment the question of whether peripheral awareness is itself a form of distributed attention) (James 1890/1950). By contrast in GDC conditions, a subject's capacity for attentional agency might be compromised, thus affecting how much might be held in the focus of attention as well as the structural relationship between focal attention and peripheral awareness.

The third way by which global modes of consciousness might be individuated is by means of functional integration: "The rough idea is that reference to modes of consciousness provides a convenient way of capturing facts about how the contents of consciousness can drive the creatures consuming systems. Normal wakefulness is characterized by the fact that the contents of consciousness are available to a wide range of consuming systems , whereas in nonstandard modes of consciousness, the contents of consciousness are not widely available for cognitive an behavioral control" (Bayne and Hohwy 2016, 69). This criterion is the most important for my argument.

[11] See Bayne et al. (2016) for a critical assessment of how these terms should and should not be used in philosophical and scientific discussions of consciousness. I rely on their work in the following.

Thus applied to the hydranencephalic cases, we can see that these subjects have a seriously denuded, though not wholly extinct, capacity to react (though, not rationally respond) to the situational primes of their familiar environment. Thus, we can contrast GDC like hydranencephaly from ordinary modes of consciousness by the flexibility and range of consumer systems that can take up with the contents of phenomenally conscious states in these two conditions. Ordinary modes of consciousness enjoy a far more robust range of functional integration than GDC.

I now distinguish between three relevant cases of GDC: coma, the vegetative state (VS), and the minimally conscious state (MCS). The distinction between coma and VS is the following: "Patients in coma have complete failure of the arousal system with no spontaneous eye opening and are unable to be awakened by application of vigorous sensory stimulation. VS is characterized by the complete absence of behavioral evidence for self or environmental awareness. There is preserved capacity for spontaneous or stimulus-induced arousal, evidenced by the sleep-wake cycle" (Giacino et al. 2002, 349). The third of these subspecies of GDC is a relatively new diagnostic category for clinicians; it can be understood in the following way: "MCS is characterized by inconsistent but clearly discernible behavioral evidence of consciousness and can be distinguished from coma and VS by documenting the presence of specific behavioral features not found in either of these conditions" (Giacino et al. 2002, 349). More precisely, these 'specific behavioral features are, 'cognitively mediated behaviors' occurring inconsistently, but are reproducible and sustained long enough in examination contexts to be reliably differentiated from mere reflex behavior (Giacino et al. 2002, 350-51). Examples of 'cognitively mediated behaviors' include: Gestural or verbal yes/no responses, verbalization, purposeful behavior "…including movements or affective behaviors that occur in contingent relation to relevant environmental stimuli and are not due to reflexive activity." (Giacino et al. 2002, 351). Relevant examples of 'purposeful behavior' include: Appropriate emotional responses (like crying or smiling) to "…the linguistic or visual content of emotional but not to neutral topics or stimuli" (Giacino et al. 2002, 351), vocal or gestural response to questions, reaching for objects, object touch that accommodates for size and shape of the held object, visual pursuit or sustained visual fixation in response to salient stimuli.

My interpretation of the hydranencephalic subjects situates them squarely in the MCS sub-category of GDC. There are two further points bearing on this interpretation. First: "In evaluating patients with DOC, it is not uncommon to clearly demonstrate discernible signs of consciousness at the bedside, yet, be unable to reproduce these signs on subsequent attempts to elicit the same behavior" (Giacino 2005, 382). This fact helps to explain the differential responses (or lack thereof) in hydranencephalic patients. Their relationship to the world is dynamic in that transitions between VS and MCS are facilitated by the affectively charged relationships that exist between primary caregivers and the subjects. Further, these fluctuations are subject to variable timescales that are context sensitive. "Fluctuations in state may occur day to day, hour to hour, or moment to moment…" (Giacino 2005, 382). Second, the most relevant and salient mode of 'purposeful behavior' demonstrated by hydranencephalic subjects is "… emotional responses (like crying or smiling) to "…the linguistic or visual content of emotional but not to neutral topics or stimuli" (Giacino et al. 2002, 351). However, this focus on visual and linguistic content seems unnecessary.

Recent evidence suggests that audition is another reasonable sensory modality by which to evaluate emotional responses that might qualify a subject as being in the MCS rather than VS. Boly et al. (2003) did PET scans on five patients in MCS, fifteen VS patients, and eighteen healthy controls who were exposed to an auditory click on their right side while the experimenters measured cerebral bloodflow. They found that, "In controls, auditory stimulation activated auditory cortex contralateral and ipsilateral to the side of the stimulation…In patients with MCS, auditory stimulation activated bilateral auditory cortex…In patients in a PVS, auditory stimuli also activated the bilateral auditory cortex, but the extent of this activation was much smaller" (Boly et al. 2003, 235–6). Further, "In patients in an MCS, the activation pattern was spatially more extended than in patients in a PVS…" (Boly et al. 2003, 236–7). An important point here is that the differential that these experimenters rely on is distribution and complexity of information processing in sensory cortices. However, given that hydranencephalic subjects have no functioning cortical network, the relevance of this study might seem minimal.

This is a mis-placed worry. The neurocognitive monitoring is a corollary to the observation of complex behaviors demonstrated by subjects in MCS in different contexts. As Giancino notes, "A key element of this new diagnostic category was the requirement that the behavior(s) of interest had to be viewed as unequivocally 'meaningful' by the examiner" (Giacino 2005, 384). This means, that the behavior of the subject is just as vital as neurofunctional evidence. Even more importantly, "We do not know what kind of neurocognitive activity is sufficient for consciousness, nor (more importantly) do we know what kind of neurocognitive activity is necessary for consciousness" (Bayne and Hohwy 2014, 131). Furthermore, we have good evidence to suggest that pre-cortical networks are essential for the realization of consciousness, even in ordinary cases. Schiff (2007) notes that, "The cerebral cortex is generally spared following severe trauma resulting in VS, again emphasizing the role of subcortical structures…" (Schiff 2007, 591). In healthy cases, there is an important contribution made by, "…the paramedian thalami and their interconnections with the basal ganglia and brainstem to organizing brain dynamics underlying normal conscious behavior" (Schiff 2007, 601; Parvizi 2009; Merker 2007). Thus, from the above study on auditory stimulation of VS, MCS, and control subjects in the PET protocol, we can conclude that auditory experience is a reliable means by which to evaluate a subjects meaningful emotional response. It is too narrow to construe this criterion for MCS attribution to just visual and linguistic content. Since that is so, we are well within our rights to interpret the positive emotional response to music by our hydranencepahlic subjects as an indication of MCS.

To conclude this subsection, I think of hydranencephic subjects as bearing the potential to live in a robustly meaningful MCS. Such subjects live less cognitively robust lives than most examples of MCS that fully meet the list of criteria outlined above. However, these decorticated subjects are still phenomenally conscious because of their dynamic and affective relationality to their surroundings, especially their primary caregivers. Finally, Bayne and Hohwy's (2016) functional integration approach to the modal individuation of consciousness provides a clear way of thinking about how to interpret the access-like capacities of these hydranencephalic subjects. In the following subsection, I will get into more empirical detail about how these phenomenally affective responses can be understood in terms of basic pre-cortical emotional and self-regulation mechanisms.

3.3 The Biological Basis of Phenomenal Consciousness in the Absence of Cognitive Access

In hydranencephalic cases, and perhaps in all cases, phenomenal consciousness is realized primarily and most basically by core emotional and homeodynamic affects (Panksepp 2005; Damasio and Carvalho 2013; Denton 2006). Core emotional affects are primitive, genetically constrained, affective arousal patterns that are tied to habitual, survival-oriented behavioral scripts (Panksepp 1998, 2005, 2011). They are feelings that prime instinctual motor responses to a familiar environment. In virtue of feeling the core emotional affect of fear, my perception of my environment shifts and my poise for fleeing would be primed in a reflexive way. Homeodynamic affects arise as the result of regulatory processes through which an organism maintains an internal equilibrium in the face of a changing and often hostile environment. Examples would be the parched sensation in your throat when you are thirsty or the grumbling feeling in your stomach when you are hungry. Both represent a loss of homeodynamic equilibrium. Another example already explored above in my analysis of the hydranencephalic children is breathing. In the above-mentioned case, as we saw, something as basic as homeodynamic self-regulation can be compromised if the proper context and affective supports are not in place. This vulnerability to be compromised places an important limit on these subjects' capacities for worldly interaction and for the kinds of contents their experiences can deliver to awareness.

It is important to note that this felt vulnerability is a core feature of the biological basis of all consciousness, not just these atypical cases.[12] Damasio and Carvalho explain that (2013, 143):

> Feelings appear to have emerged, prevailed, and mobilized such complex neural machinery because directly portraying the advantageous or disadvantageous nature of a physiologic situation as a 'felt experience' facilitates learning of the conditions responsible for homeostatic imbalances and of their respective corrections, as well as anticipation of future adverse or favourable conditions. In this way, feelings provide and additional level of regulation of behavior.

The main difference between the hydranencephalic case and the ordinary case is that the former lacks the integrative self-regulatory functioning of the cortical system. In the absence of this kind of autonomous modulatory processing in the central nervous system, hydranencephalic subjects become dependent on the caregiver to perform similar functions through interpersonal relationships. This can be seen from considering just how dependent such patients are on a familiar and comfortable environment for mental function. To be sure there is sensory consciousness, including touch, hearing, and some degraded vision. But the increased amount of affective response is the key phenomenon that distinguishes these cases from ordinary ones.

Without the biologically basic functioning of these affective processes, our cognitive capacities cannot develop and function (Damasio 1999). The living body is hedonically

[12] Bayne and Hohwy also agree that we should not thereby discount that these subjects are consciousness having beings: "This notion of a limited range of conscious content is supported by evidence suggesting that the mechanisms responsible for 'raw emotional feelings' are often preserved in disorders of consciousness even though the capacities required for more cognitive complex sates are disrupted" (Bayne and Hohwy 2016, 65). I turn to some more of this evidence presently.

perturbed in different ways and this is likely the foundation of phenomenal consciousness in hydranencephalic children. Thus, Damasio and Carvalho continue (ibid):

> From both evolutionary and ontogenetic perspectives, the experiential aspect of homeostatic neural mappings can also be considered the lowest level of the mind and consciousness. Indeed, the available evidence indicates that phylogenetically recent sectors of the nervous system, such as the cerebral cortex, contribute to but are not essential for the emergence of feelings, which are likely to arise instead from older regions such as the brainstem, suggesting that feelings are not exclusive to humans or even mammals.

What hydranencephalic patients show us is that there are affectively conscious sub-cortical networks which can, when necessary, with proper development and support, serve as the physiological basis for the realization of phenomenally conscious experience. There is a core affective basis to mental life that undergirds the cognitive capacities typically realized by the cortical system and that phenomenally conscious states can be realized without the modulating influence of the cortex (Merker 2007; Parvizi 2009). With the self-regulating support of a functioning cortical system, these affective experiences can serve as the basis for the motivation of more explicitly intentional behaviors. In the absence of the modulatory influence of the cortical system, such subjects require the compensatory support of a dedicated care giver, without which, they are unable to survive. Reasoning on the empirical hypothesis that the cortical network is primarily responsible for the instantiation of a global workspace in ordinary human cases, it therefore follows that:

> **AO2.** Hydranencephalic patients do not have access consciousness.

If it is the case that there are subjects who have phenomenally conscious experiences but do not have cognitive access, then the latter cannot be part of what it means to be phenomenally conscious. Therefore, the conclusion follows that phenomenal consciousness is not constituted by access consciousness (AO-C1).

4 Two Important Objections

I must now consider two important objections. The first objection follows immediately from my considerations of access consciousness (§4.1). The second pertains to the question of the proper relation between normal and non-normal cases in theorizing about the mind (§4.2); to what extent should non-normal cases bear on our theories about what a phenomenon is like in ordinary cases?

4.1 Hydranencephalic Patients Have Access-Like Capacities

The careful reader will rightly point out that some access-like functions remain in hydranencephalic cases. These include the capacity to distinguish the mother (or other primary caregiver), associative learning (e.g. differential response to preferred music), consolability, conditioning, orienting, and visual tracking (Shewmon et al. 1999, 372). Since this is the case, it might be argued —similar to the claims made by Cohen and

Dennett (2011) against Block (2007) — that hydranencephalic patients have a lesser *degree* of cognitive access than ordinary patients, but still exhibit *some* cognitive access.

We can put this insight into the form of a premise that both my objector and I can endorse. That is:

AO3*. Hydranencephalic patients have access-*like* functioning.

If these access-like functions are plausibly construable as examples of *cognitive* access, then my first conclusion will be falsified as (AO3*) is in direct contradiction with (AO2). However, if I can defend the view that hydranencephalic patients *lack* cognitive access (AO2), then I can modify (AO3*) and carry on with my argument. In what follows, I argue that the access-like functioning of hydranencephalic patients should be not understood in terms of cognitive access, but in terms of what I will call 'affective access'.[13]

My approach is closely related to, but also importantly different from, the work of Tyler Burge on phenomenal and access consciousness (Burge 2007a, b). Like Burge, I argue for a strong distinction between cognitive access and phenomenal consciousness. Burge refers to 'rational-access consciousness' and 'phenomenal consciousness'. His distinction maps a capacity to be intentionally directed towards the world through a propositional attitude in the case of rational-access consciousness on the one hand, and for there to be something it is like for one to be in the states they're in on the other. More precisely, each of these forms of consciousness has a mode of reflexivity that structures a subject's access to the contents of their token mental state: "Self-referential reflexiveness in thought has a logical form, which falls under norms for logical transformation. No such norms govern phenomenal consciousness *per se*" (Burge 2007b, 409). I note that there is an potentially important distinction between Burge's notion of 'rational-access consciousness' and what Ned Block (2007) and I call 'cognitive access' or 'access consciousness'.

Anyone who is incapable of thinking thoughts will be incapable of rational-access consciousness. By contrast, what individuates mental states that are cognitively accessed is that their content can function as the basis for the formation of an intention on the part of subjects having them. Now, two of the three canonical ways for subjects to cognitively access the contents of their mental states through forming intentions is by performing inferences and speaking. It is straightforward enough that one needs have the capacity to entertain propositional attitudes in order to generate such forms of behavioral output. To this extent, Burge's notion of rational-access consciousness overlaps with cognitive access. However, in the case of intentional action, this is far less obvious. It seems highly plausible that plenty of organisms form intentions and act on them without the mediating influence of a propositional attitude or being sensitive to the logical norms of transformation that govern the formation of such thoughts, or have any explicitly self-conscious belief about the content of their intention.

[13] Note, that in endorsing this claim I am not committed to a strict cognition vs. emotion distinction in the brain. It has been extensively argued that this kind of approach to neural function is probably a non-starter (Pessoa 2013). I am friendly to the view that all cognition is permeated with affect and that much of our affective lives is robustly cognitive. What I am committed to is the view that the phylogenetic and ontogenetic roots of mental functioning are affective and that these have the capacity to sustain mental life in the absence of more robust cognitive functions.

Even if one were to hold this distinction between rational-access consciousness and cognitive access as a firm and principled one, I argue that we need to further gradate the concept of 'access' once again and make a further distinction. This third form of access is what I call 'affective access'. I maintain that it is in virtue of having affective but not cognitive access to phenomenal content that we can explain the access-like capacities of hydranencephalic subjects. My reasonsing is that the access-like capacities of hydranencephalic cases are structurally different from normal functions of rational-access consciousness and cognitive access in corticated humans in two ways. Namely, all the access-functions in the hydranencephalic patients are profoundly context-sensitive and affectively biased. By 'context-sensitivity' I mean that without very particular contexts (i.e. the presence of the caregiver), little or no interaction with the world is possible. 'Affective bias' refers to the way in which one's capacities for perception and attention rely on bodily affect (Todd et al. 2012). In particular, the capacity of hydranencephalic patients to respond to their world at all is hugely dependent on physical comfort and the presence of positive reinforcement from trusted caregivers. In the absence of these affective contextual factors, there is very strong negative affective response followed by the quick onset of the VS.

Contrast these hydranencephalic access-like functions with the ordinary functions of cognitive access. Recall that the canonical description of cognitive access is the following: a mental state *M* is access conscious if *M*'s content, in virtue of being represented by subject *S,* is *poised for use* in one or all of the following: as a premise in an inference, in the rational control of action and/or for rational control of speech (Block 1995, 231). In ordinary cases of cognitive access, (i) the content of a representation is 'poised for use' in different types of actions and (ii) the subject has 'rational control' over how the content is expressed through the various channels of output available to them. This capacity is also sometimes described in terms of the subject having 'free use' of the content of its access-conscious representations. Content being *available* for cognitive access is usually prefaced with some qualification of volitional intentionality. When we pay attention, introspect, speak, act, or think we do so with a certain degree of freedom. We can choose what to do with the content of our representations (speak, think, act); the subject of cognitive access can select from several viable behavioral pathways through which to generate an output for the content of their representations.

The hydranencephalic children under examination in these studies have severe limits on such capacities. The connection between perception and action is constituted by affectively biased reactions rather than poised, volitional, and rational responsiveness. Hydranencephalic subjects lack a capacity for context-independent information processing. Context *independent* cognitive capacities better represents the cognitive access consciousness realized by the cortical system.[14] Part of what guides the subject's capacity to select an action for its represented content is a cognitive ability to process information in different ways (i.e. via inference, rational action, or speech), across different contexts. The children under examination in these studies have no such capacities because of their dependence on the caregiver to exercise any and all interactions with their world. Therefore, I can re-construct the third premise of this argument in the following way:

[14] This is not to say that ordinary corticated human experience is *not* mediated by affective-access. My claim here is simply to note that hydranencephalic subjects have only affective access but not cognitive access. Ordinary cases demonstrate both.

AO3. Hydranencephalic patients have access-like functioning that is grounded not in cognition but in core emotional and homeodynamic affects.

The access-like functions of the hydranencephalic children are grounded in our basic capacities for affect rather than cognition. The difference here can be understood in terms of the subject's capacity (or lack thereof) to utilize information in context independent ways (Hurley 1997). In the case of affective access, the connection between experience and action is instinct-driven and affectively biased; in cases of cognitive access, the connection is mediated by a poised volitional rationality and the capacity to choose. Because of this difference, subjects who lack cognitive access but have affective access lack the ability to exercise their mental functioning across contexts. The opposite is true for those who have cognitive access.[15]

From these considerations, we can generate the following conditional as the fourth premise of the argument:

AO4. If hydranencephalic patients have access-like functioning that is grounded not in cognition but in core emotional and homeodynamic affects, then phenomenal consciousness does not overflow this affectively grounded access ('affective access').

Before deriving the conclusion embedded in the consequent of this conditional, I need to address what exactly affective access is. Some relevant questions are: what is doing the accessing and what is accessed and how does affect encode those relations?

Answering these questions will help me articulate another relevant disagreement with Burge. First, let me flag a point of agreement. What Burge and I share is the conviction that just in virtue of having phenomenally conscious experience one has a kind of access to the qualitative character of that experience and that this access is importantly distinct from cognitive access and for Burge, from rational-access consciousness (Burge 2007a). Thus, Burge claims that "A phenomenally conscious state is always a state of an individual psychological subject. The state is conscious for the individual. This 'for' needs scrutiny. The conscious phenomenal aspects of a conscious state are present for, presented to, the individual. In this response, phenomenal consciousness involves access" (Burge 2007b, 403). On this, I agree with Burge. However, our disagreement is what is philosophically relevant here.[16]

[15] It is also important to note here that the kind of access I am fixated on is different from Burge (2007a, 2007b) and Levine's (2006) ideas of purely phenomenal access. This latter form of access seeks only to explain the raw presence of phenomenal content for a subject. I am claiming that affective access carries with it a certain functional profile over and above mere phenomenal presence. This contrast will become clearer in what follows.

[16] A related by somewhat tangential disagreement is this. Burge thinks it coherent to claim that there can be phenomenally conscious states that are not experienced by the subject having them. He clearly distinguishes between cases where someone experiences something but does not attend to the content of the experience or otherwise process those contents through the mechanisms of rational-access consciousness (Burge 2007a, 390) on the one hand, and those states that have a phenomenal character but are not experienced by a subject, on the other. I'm skeptical of this possibility but won't argue against it here. Instead I note that if there is a mental state with a qualitative character that isn't *for* a subject, then I'm not sure why we would be in a position to say of such a mental state that it was phenomenally conscious (see Levine 2006; Kriegel 2009). This can be formulated as an objection to Burge's way of talking by noting that if it is the reflexive mode of presentation or accessibility of phenomenally conscious content that makes a mental state phenomenally conscious, it's not clear how a state can be phenomenal without being accessed in a proprietary phenomenal way by the subject having the experience.

Burge thinks that phenomenally conscious states have no necessary connection to a host of mental functions that it seems plausibly connected with. On Burge's view, being phenomenally conscious and having phenomenal access to the contents of experience do not necessarily involve perceptual representation, information registration, or thought (Burge 2007b, 409–11). Phenomenal consciousness has a proprietary mode of reflexive presentation that gives the subject having it knowledge of the content of their experience just in terms of the sensations one is feeling in virtue of being in the state they're in.[17]

Burge's reasoning for denying that phenomenal consciousness has any necessary connection with or is in any way constituted by perception or information registration is that there are phenomenally conscious experiences of which we are reflexively aware – that is, to which we have phenomenal access to their contents – in the absence of any of the above modes of worldly interaction. His paradigm example is pain, of which he claims (Burge 2007b, 401):

> Pain is a paradigm of phenomenal consciousness. Pain is not perceived, and it is not perception of bodily damage. It lacks the marks of true sensory perceptual representation, or, I think, any other genuine representation. There are no objectifying elements in the sensing of pain. There is no distinction in the sensation of pain between mere proximal stimulation and stimulation that comes from a distal source. Similarly, there is no capacity, in the mechanisms for pain's carrying information about bodily damage, to distinguish between proximal and distal information. There are no perceptual constancies in this information-carrying system. There is no evident rewarding type of explanation that centers on either getting the pain right or getting the bodily damage right.

Burge's reasoning here is fairly straightforward.[18] Pain is not a perception of anything, because the mode of presentation of pain does not objectify its content in a way that meets Burge's strictures for what will count as perceptual representation (see Burge 2010). The claim that the phenomenology of pain comes apart from information registration is derived from the fact that we often experience profound bodily damage that doesn't result in pain until much later (Klein 2015). Further, we can experience pains that are dissociated from physical damage to the body. Therefore, the sensation of pain does not necessarily give us any information about anything. However, Burge does note that, "Most pain carries information about, and so is functionally related to, damage in certain locations in the body" (Burge 2007b, 401). However, the feeling of pain's being functionally related to something does not entail that this feeling is constituted by the information it registers through this functional relation.

The problem with this view is that it does a bit of violence to a plausible concern of any viable theory of phenomenal consciousness: "It is the concern that any putative conscious experience should be the experience of *an agent*. The thought here is that we cannot make sense of the image of free-floating experiences, of little isolated islets of experience that

[17] I leave aside the issue of thought because Burge and I agree on that front, the other two are more controversial.

[18] For reasons of space, I cannot be as thorough as would be ideal. Instead, I will mark points of agreement and disagreement and provide some initial reasoning for why I think pain is not so much of a nomological dangler as Burge thinks it is (cf. Smart 1959). I then return to the conclusion of the argument I have been constructing. Burge's developed theory of perceptual representation can be found in *The Origins of Objectivity* (2010).

are not even potentially available as fodder for a creature's rational choices and considered actions" (Clark and Kiverstein 2007, 502). There are two things to say here. First, *pace* Clark and Kiverstein, I agree with Burge that rational choice is not a suitable mechanism for thinking about the kind of access that accompanies phenomenal consciousness. However, *pace* Burge, the mechanism of access proper to phenomenal consciousness is *not* divorced from the embodied subject's informational registration about its own condition or its possibilities for action. This is the lesson of the hydranencephalic patient.

In response to Burge's pain example, I agree with Klein (2015) that pains are always imperatives that direct our actions in an instinctual, reflex like way, that is their functional role. Our bodily experiences – and indeed, pain is the paradigm example here – are grounded in a cellular reality that is organized primarily around mechanisms of homeodynamic self-regulation. Pain is the dis-equilibriating of homeodynamic self-regulation (Craig 2003; Klein 2015). Even at a cellular level, information is processed according to its threat-value to organismal stability. The hierarchical organization of this cellular threat-responsiveness is the biological basis of all phenomenal awareness. Consider the following from Cook et al. (2014, 702):

> … sentience and irritability are the ability of the excitable cell to detect and respond to the dangers of excessive positive charge […] the 'pooling' and temporal ordering of many such sentient cells could result in higher-levels of sentience and irritability, that is, 'awareness' and 'goal directed motor activity' in animal organisms. Thus, the sentience of excitable cells is seen as a primordial building block that underlies the organism-level phenomena of feeling and awareness, which is necessary, but alone not sufficient to explain those higher-level phenomena. A 'sufficient' argument will undoubtedly require consideration of the circuitry within neural modules, their coordination, competition, and the sequential activation of circuit components, but we maintain that the information processing of neuronal circuits would not, alone, explain feeling, awareness and other aspects of consciousness without including the phenomena of cellular sentience.

The behavioral capacities of our hydranencephalic patients gives us a concrete solution to the question of sufficiency indicated in the tail-end of the above citation. Namely, that a pre-cortical nervous system integrating the homeodynamic feedback of the body's viscera is sufficient for phenomenally conscious experience. Those experiences are not isolated by a proprietary phenomenal mode of presentation that is cordoned off from the subject's sense of embodiment. Nor also is that mode of access adequately defined in terms of the way in which contents might figure in rational deliberation of an agent's choices. Rather, the contents are, in their minimal state, available for what I call 'affective access', that is the habitual kinds of actions that are exemplified by our aversion to pain and our enjoyment of pleasure. So, the kind of access proper to phenomenal consciousness, in contrast with cognitive access and rational-access consciousness, involves encoding the contents of those experiences in terms of mechanisms that lead to affectively, though not necessarily rationally deliberative, responses.[19] This further underscores the difference between affective access and purely phenomenal access, the latter of which denies that phenomenality has any functional profile.

[19] For more detail on this point see Smith (2018, chapter 5).

We can now return to the argument and derive the final conclusion. If it's the case that there can be phenomenal experiences without cognitive access but we have no evidence of phenomenal experience outside of affective access (AO4), then it follows that:

> **AO-C2.** Phenomenal consciousness does not overflow this affectively grounded access ('affective access').

The evidence seems sufficient to conclude that there is an important difference between phenomenal consciousness and *cognitive* access, precisely because there are subjects able to enjoy phenomenally conscious mental lives in the absence of the brain structures necessary to realize cognitive access. Nevertheless, it is plausible that there are no phenomenally conscious states without affective access. All of our experiences are grounded in mechanisms of biological self-regulation. Our embodied feelings are the phenomenal window through which the imperatives that are embodied in those self-regulatory mechanisms make themselves manifest to the subject of experience (see Craig 2003; Damasio and Carvalho 2013; Cook et al. 2014; Panksepp 2005, 2011).

4.2 On the Relation between the Ordinary and the Non-Ordinary Cases

An important objection remains; it could be argued that my evidence for the overflow case is so atypical that it tells us nothing useful about the ordinary case. Perhaps in hydranencephalic cases there is phenomenal consciousness without any cognitive access. However, in ordinary cases, these two are never separated.

What the pathological cases show is that cognitive access cannot constitute phenomenal consciousness because there are cases of phenomenal consciousness without cognitive access. It is consistent with this view that, in ordinary cases, the content of our experience is *cognitive accessible*, though not always *cognitively accessed*. I am happy to endorse such a view, as I do not think it threatens the main insight, which is that our experience is not the product *only* of our capacities for intentional response and cognition, but also by our capacities to be hedonically affected in certain ways through our embodied relationship to our surroundings.

There is a view in the neurosciences that cognition and emotion are deeply integrated in the normally functioning brain (Pessoa 2013). Perhaps this dynamically integrated functioning of the normal human brain precludes any meaningful insight into the structure of consciousness and affect from extreme pathological cases. I am happy to grant that in normal cases, experience is realized by a dynamically integrated neural structure that depends on a body and a world. On this score, it is worth reiterating that the mediating influence of neuroplasticity and development are significant, especially in these hydranencephalic cases. The modulating influence of the cortical cap in ordinary cases is not simply a useful addition but an dynamically integrated part of ordinary cognitive function. Thus, a sober and parsimonious conclusion is that phenomenal consciousness is often not cognitively accessed but that in healthy adults, the contents of such states could be accessed, perhaps with the aid of attentional training (cf. Thompson 2015, 8). Importantly, phenomenality and cognitive access are physically realized in different ways and remain distinct (but often interacting) forms of

consciousness. While it may be accurate to affirm a moderate endorsement of phenomenal overflow of cognitive access in normal cases, it seems that there is strong inaccessibility in the case of hydranencephalic patients in the case of cognitive access, but of course, not with affective access.

The point is that different parts of the brain, however integrated, contribute different aspects to our experience. It is just not the case that phenomenally conscious experience is constituted by a cortical network that sits on top of an otherwise unconscious information processing system. However holistic the brain may be in its ordinary corticated functioning, it also is highly plastic and exhibits degrees of modularity. This is why hydranencephalic patients are able to live without a cortex. Our mid-brain and brain stem contribute to experience and they do so in both pathological and non-pathological cases. Just because the cortical network recruits the lower parts of the brain into a holistic network that realizes experience in the normal case, does not mean that the lower brain does not contribute a substantial amount to the realization of those experiences in both normal and non-normal cases.

We have every reason to think that experiences go beyond what we can think, they have a kind of affective depth that is grounded in pre-cortical circuits of the brain, and that this layer of phenomenology is worth exploring further in terms of the kinds of motivational and organizational role such affective experiences might have on our ordinary mental functions, especially attention and perception. By focusing on the affective structure of phenomenal experience, we have resources for thinking about the way that phenomenal consciousness plays a role in our mental lives. On this view, consciousness is no nomological dangler (Smart 1959).

5 Conclusion

The preceding discussion has established that there is an important difference between phenomenal consciousness and cognitive access. At the most general level, I want my account to function as a cautious endorsement of Block's (2007) use of this distinction in trying to examine phenomenal consciousness empirically against those theorists who think there can be no meaningful distinction between these two forms of consciousness (Cohen and Dennett 2011). I have approached this conclusion by a different route than is common in this debate. The persistent emphasis on visual perception, attention, and verbal report makes it difficult to escape the explanatory circle between verbal report and phenomenally conscious states.

By contrast, by exploring the behavioral capacities of some hydranencephalic children, I have suggested that there is compelling evidence that phenomenal consciousness is realized by brain and body structures that exist below the threshold of cortical function. The lower brain systems realize an essentially affective mental life that does not require higher cognitive function in order for there to be something it is like to be in such states. Our capacity to feel our own bodies is sufficient to realize phenomenally conscious states, often in the absence of cognitive access.

Acknowledgments I have presented this work in a number of venues and thank the audiences there for instructive criticisms. In particular, my gratitude to the faculty and graduate students at the University of Toronto, especially Jennifer Nagel, Mohan Matthen, Mason Yakety Westfall, Aaron Henry, Karolina Hubner, Nick Stang, and Andrew Sepielli. I also thank the audience at the 2017 meeting of the Eastern Division of the APA in Baltimore. Specifically, I am grateful to Emma Esmaili for a thorough set of helpful comments, and to Arindam Chakrabarti and Zach Irving for their spirited engagement with my work. I am also grateful to Jelena Markovic for comments on a recent draft. The paper has been much improved on account of some helpful suggestions from two anonymous referees, my thanks to both of them. Finally, my thanks to Evan Thompson with help on a very early version of this paper.

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