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## Cognitive access and cognitive phenomenology: conceptual and empirical issues

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The well-known distinction between access consciousness and phenomenal consciousness has moved away from the conceptual domain into the empirical one, and the debate now is focused on whether the neural mechanisms of cognitive access are constitutive of the neural correlate of phenomenal consciousness. In this paper, I want to analyze the consequences that a negative reply to this question has for the cognitive phenomenology thesis – roughly the claim that there is a “proprietary” phenomenology of thoughts. If the mechanisms responsible for cognitive access can be disentangled from the mechanisms that give rise to phenomenology in the case of perception and emotion, then the same disentanglement is to be expected in the case of thoughts. This, in turn, presents, as I argue, a challenge to the cognitive phenomenology thesis: either there are thoughts with cognitive phenomenology we lack cognitive access to or there are good reasons to doubt that there is such a thing as cognitive phenomenology. I discuss and explore the conceptual and empirical problems for assessing this disjunction, and conclude that defenders of the cognitive phenomenology thesis have nothing to fear from this distinction. I finish by speculating on how it might, in turn, speak in favor of the cognitive phenomenology thesis.

**Keywords:** consciousness; cognitive phenomenology; cognitive access; dual system theories; dreams; global workspace

There is a well-known conceptual distinction, introduced by Block (1995–2002a), between access consciousness and phenomenal consciousness. A mental state is access-conscious if and only if, roughly, its content is available for belief formation and rational control of action, whereas a mental state is phenomenally conscious if and only if there is something it is like to be in that state. The debate over whether this conceptual distinction picks up different properties has recently moved away from the conceptual domain into the empirical one, and it has focused on the possibility of phenomenology without cognitive access; that is, on whether the neural basis of phenomenal consciousness can be disentangled “from the neural machinery of the cognitive access that underlies reports of phenomenal consciousness” (Block 2007a, 481). This paper attempts to explore the consequences of a positive answer to the previous question for the debate about cognitive phenomenology.

Consider the proposition that it rains in Mexico in August. Call this proposition “*p*”. *p* is a proposition toward which one can have different attitudes. One can believe that *p*, desire

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that  $p$ , hope that  $p$ , doubt that  $p$ , etc. These different attitudes correspond to different mental states. I will use the term “thought” to refer to them.<sup>1</sup>

It is uncontroversial that there are thoughts we have cognitive access to: we can report the content of (some of) our thoughts. I can let you know that I desire to finish this paper, that I believe that the coffee is getting cold and that I hope that Angelica finishes her dissertation. Controversy arises when we consider the phenomenology of thoughts. Although some authors have maintained that thoughts are example of states for which there is not something it is like to be in them (Braddon-Mitchell and Jackson 2006), few authors would agree with the claim that all thoughts lack phenomenology. One of the most interesting questions in current controversy around the phenomenology of thought is whether there are thoughts whose phenomenology outstrips sensory phenomenology broadly understood as to include images, moods, and the feelings associated with emotions; whether there is a “proprietary” phenomenology of thoughts (Bayne and Montague 2011). I will refer, as is typically done, to this kind of phenomenology as *cognitive phenomenology*.

*Cognitive Phenomenology* Some thoughts are phenomenally conscious and (and at least some of them) have a *proprietary* phenomenology.

The main problem in evaluating this thesis is that the debate rests highly upon phenomenological observation. Participants in the debate tend to disagree on the details of their experiences and we lack a criterion to decide who is introspecting better – or even to decide whether they just happen to have different experiences. I do not mean that we should study the alleged phenomenology of thoughts without introspection, but rather that we should additionally look for empirical results that help tilt the scales in favor of one position or the other. There is little work in this direction and looking for the empirical commitments of an hypothesis seems to be the right way to go in order to assess it. This paper attempts to advance the discussion in this direction.

I will start by presenting a challenge to the cognitive phenomenology thesis. The core idea of this challenge is that, if the mechanisms responsible for cognitive access can be disentangled from the mechanisms of phenomenology in the case of perception and emotion, the same disentanglement is to be expected in the case of thoughts. I will argue that if, on the contrary, there is no distinction between thoughts to which we have cognitive access and phenomenally conscious thoughts, then the cognitive phenomenology thesis is jeopardized. This problem is presented in Section 2 after I have properly introduced and motivated the distinction between phenomenology and cognitive access in Section 1. In Section 3, I discuss the problems for assessing whether there are phenomenally conscious thoughts we cannot access at the empirical and conceptual levels. On the conceptual side, there seems to be no room in our current taxonomies, based on report and deployment in reasoning, for the required category. However, I will argue that the empirical evidence derived from studies in unconscious reasoning favors a broader taxonomy consistent with the requirements of the cognitive phenomenology thesis. Finally, I will discuss the problems for empirically assessing the reality of phenomenally conscious thoughts we lack cognitive access to. I conclude by speculating about how the distinction between cognitive access and phenomenology might, in turn, speak in favor of the cognitive phenomenology thesis.

## **1. Phenomenology and cognitive access**

There is a conceptual distinction between two of the senses in which the term “consciousness” is deployed. They have been labeled “access” and “phenomenal consciousness” (or simply phenomenology) (Block 2002b). However, it remains controversial whether the neural mechanisms in virtue of which a state is access conscious differ from those in

virtue of which a state becomes phenomenally conscious. In other words, even if we grant the conceptual distinction, it is unclear whether there are states whose content is available for belief formation and rational control of action but lack phenomenology, or states that have phenomenology but are not available for belief formation and rational control of action.

Granting the conceptual distinction, the question seems to be an empirical one. Accordingly, the debate has recently moved away from the conceptual domain into the empirical one focusing on the possibility of phenomenology without access. For this purpose, the notion of access-consciousness has been refined to that of *cognitive access*, and the question turned into whether the neural basis of phenomenal consciousness can be disentangled from the neural machinery of the cognitive access on which reports of phenomenal consciousness depend (Block 2007a, 481). The underlying idea is that the neural machinery of cognitive access on which the corresponding reports depend is the same neural machinery on which belief formation and rational control of action depend. Defenders of what I will call “access theories” of phenomenal consciousness maintain, whereas *non-access theories* of phenomenal consciousness deny, that the neural mechanisms on which cognitive access depends are constitutive of phenomenal consciousness.<sup>2</sup>

The most widely accepted theory of cognitive access is the Global Workspace Theory (Baars 1988; Dehaene 2009).<sup>3</sup> According to this theory, the mental states we can report on – the mental states we have cognitive access to – are those encoded in the global workspace (GWS). States encoded in the GWS are those that win the competition to activate reverberatory activity in the GWS, thereby maintaining their peripheral sensory excitation until a new coalition wins out (Dehaene 2009). The information encoded there is made available to all kind of processes like those responsible for report, the formation of beliefs or the rational control of action. If we assume that the GWS is the right theory of cognitive access, then access theories maintain, and non-access theories deny, that being encoded in the GWS is a necessary condition for a mental state to have phenomenology.

This paper assumes the truth of a non-cognitive theory of phenomenal consciousness to show its consequences for the cognitive phenomenology debate. However, for those who are not familiar with this position, I would like to motivate the view by quickly reviewing the empirical debate.

Based on the results of partial report experiments, like those in Sperling (1960) and some more recent results (Landman, Spekreijse, and Lamme 2003; Sligte, Scholte, and Lamme 2008), Block (2007a, 2011) has argued that the capacity of the memory buffer in which the content of phenomenally conscious states is encoded is greater than that of the memory system on which cognitive access depends, in favor of non-access theories. He argues that the empirical evidence suggests that the capacity of the visual phenomenal system is greater than that of the working memory buffer on which reportability depends; and hence, that the content of experience overflows what we can cognitively access: there is more to phenomenology than what we can tell.

In reply, some authors (such as Brown 2012; Brown and Lau [forthcoming](#); Kouider et al. 2010; Rosenthal 2007) have maintained that the content of phenomenology might not be as rich as some might have thought and that we suffer from some kind of “refrigerator light” illusion: it seems to us that there is a rich phenomenology because whenever we attend to a particular location we find a consciously represented element and we thereby mistakenly assume that it was already conscious before attending. Some proponents of this line of response have claimed, for example, that there is a generic representation of a matrix of alphanumeric characters in Sperling’s experiment before the cue, but no specific

representation as of any particular character (for discussion, see Block 2011; Kouider, Sackur, and de Gardelle 2012; Stazicker 2011).

The conclusions to be derived from partial reports experiments remain controversial. However, alternative approaches have been suggested to settle the discussion. Elsewhere (Sebastián 2014), I have presented further support in favor of the claim that cognitive access is not required for phenomenology, which is not subject to the controversy surrounding partial report experiments (see also Block 2014), by relating the neural correlates of cognitive access to empirical research into the neurophysiology of dreams.

There is plenty of empirical evidence suggesting that cognitive access essentially depends on the activity of the dorsolateral prefrontal cortex (see, e.g., Fuster 2008; Goldman-Rakic 1988; Oliveri et al. 2001; Turatto, Sandrini, and Miniussi 2004); and, indeed, the very proponents of the GWS rely on the activity of the dorso lateral prefrontal cortex (dlPFC) in their neuronal model (Dehaene and Naccache 2001). Especially, illuminating is the result obtained by Lau and Passingham (2006). In their experiment, subjects are presented with two possible stimuli (a square or a diamond). A mask that shares a contour with the stimuli leading to a reduction in perceived brightness and to degraded perception of the spatial shape of the target (metaccontrast mask) is presented after a short variable period of time called the “stimulus onset asynchrony” (SOA). After the presentation of the target and the mask, subjects have two tasks: (i) decide whether the target stimulus was a diamond or a square and (ii) indicate whether they actually saw the target or were simply guessing in the previous task. The first question attempts to measure the objective performance capacity of the subjects: how good they are at identifying the target stimulus. The second question is intended to measure their level of confidence in the identification task they just performed: how confident they are of having seen the stimulus. The performance (measured by (i)) and the confidence (measured by (ii)) change as a function of the SOA. Interestingly, we can find two conditions (different SOA) in which the subjects perform equally well, but such that, in one they tend to say that they have seen the stimuli, whereas in the other, they tend to say that they were just guessing when answering the first question. This result clearly suggests a difference in the cognitive access subjects have to the content of their states between the two conditions. After observing this result, Lau and Passingham performed functional magnetic resonance imaging (fMRI) on the subjects of the experiment. The study revealed, as expected, that the condition where subjects tend to report having seen the stimulus – the condition in which subjects tend to have cognitive access to the perceptual information – is associated with a significant increase in dlPFC activity (Brodmann’s area 46), indicating that this area is responsible for cognitive access. However, fMRI and positron emission tomography studies have shown that the dlPFC is selectively deactivated during sleep (Braun et al. 1997; Maquet et al. 1996, 2005; Muzur, Pace-Schott, and Hobson 2002); a period in which, common sense and independent evidence show (Horikawa et al. 2013; LaBerge 1988; Leclair-Vinsonneau et al. 2010), we entertain conscious experiences: dreams. This suggests that the mechanisms on which cognitive access relies are not constitutive of the neural correlates of our conscious experience; and so, that the two mechanisms can be disentangled in favor of a non-access theory of phenomenal consciousness.

Even if one thinks that the evidence in favor of non-access theories is not decisive, I think it suffices to make it an alternative worth considering. And it would be a very bad starting point if the cognitive phenomenology hypothesis were to depend upon its falsity. So, in the rest of the paper I will simply assume its truth – cognitive access is not constitutive of phenomenology – and explore its consequences for the cognitive phenomenology thesis.

## **2. The challenge**

If we accept the truth of non-access theories of consciousness, then a mental state does not become phenomenally conscious by virtue of the cognitive access we have to it:<sup>4</sup> phenomenology is a feature of mental states that does not depend upon the mechanisms on which reportability, in turn, depends. For illustration, consider the GWS theory. According to it, states encoded in the GWS are thereby made available for report, as well as for belief formation and rational control of action: mental states we have cognitive access to are those encoded in the GWS. The information encoded there is made available to all kind of processes such as reporting, formation of beliefs or rational control of action.

However, if the neural mechanisms of phenomenology are independent of those of cognitive access, then phenomenology is not something that arises in the process of being encoded in the GWS. States are phenomenally conscious without any need of being encoded in the GWS, as illustrated by those states encoded in the iconic memory<sup>5</sup> in partial report experiments or those we undergo during dreams.

If the GWS theory is the right theory of cognitive access – as I am considering for purposes of illustration – then thoughts are like any other processes competing to activate reverberatory activity in the GWS (Dehaene 2009). Thoughts encoded in the GWS are those on which we can report. If the belief that it is raining in Mexico is encoded in the GWS then I can, non-inferentially, form the belief that I believe that it is raining in Mexico, I can consider whether I prefer to wear an umbrella or getting wet, and I can report that I believe that it is raining in Mexico.

According to the cognitive phenomenology thesis, some thoughts have proprietary phenomenology. My presentation of the cognitive phenomenology thesis is neutral on whether the alleged proprietary phenomenology is due to the content of the thought or to the propositional attitude; that is, it is neutral on whether there is a common proprietary phenomenology between my belief that it rains in Mexico and my desire that it rains in Mexico, or between the latter thought and my desire that there is a political change in the next elections. In any case, when those thoughts are encoded in the GWS, I can report on them. However, if the mechanisms of phenomenology can be disentangled from the mechanisms on which cognitive access depends, thoughts would hardly get their phenomenology by virtue of being encoded in the GWS.<sup>6</sup>

We are then faced with a dilemma: either there are thoughts with cognitive phenomenology we lack cognitive access to (phenomenally conscious thoughts that are not encoded in the GWS) or there are good reasons to doubt that there is such a thing as cognitive phenomenology, because the mechanisms of cognitive access are not likely to give them their phenomenology. In the next section, I will make explicit and face the problems, both at a conceptual and at an empirical level, for assessing this dilemma.

## **3. Assessing the reply to the challenge**

Defenders of the cognitive phenomenology thesis are committed to embracing the first horn of the dilemma; that is, they are committed to the claim that there are phenomenally conscious thoughts we lack cognitive access to – phenomenally conscious thoughts on which we cannot report. In order to evaluate this alternative, we are first faced with a *prima facie* conceptual problem: Can we make sense of this possibility? In the next subsection, I will approach this question by looking into current taxonomies of thoughts. I will show that although they hardly make room for the required kind of thoughts, it is a consistent possibility to widen our taxonomies to do so. Once we show that the position is not conceptually

inconsistent, the question whether there are phenomenally conscious thoughts we lack cognitive access to becomes an empirical one. In Section 3.2, I argue on the basis of empirical evidence in favor of an affirmative answer to this question and conclude by hypothesizing a way in which this possibility might favor the cognitive phenomenology thesis.

### 3.1. *Conceptual problems*

We are working on the hypothesis that states we have cognitive access to are made available to a bunch of processes including those responsible for rational control of action, belief formation and report. Paradigmatically, reportability is the mark of the states we have cognitive access to. Most would agree that they can tell what they are consciously thinking. This is because when we talk about *conscious thought*, we typically refer to thoughts we have cognitive access to (I will refer to this kind of thoughts as “a-conscious thoughts”). The same point is reflected in scientific research. For example, Baumeister, Masicampo, and DeWall (2011) point out that “Conscious thought enables people to talk to others and thereby enables small groups to resolve differences.” Independent of whether (a-)conscious thoughts have such a social role, which seems plausible, the quote perfectly illustrates the idea that we presuppose reportability when we talk about conscious thoughts.

Beyond the distinction between a-conscious and non-a-conscious thoughts, there is a widely accepted distinction between *occurrent and dispositional* thoughts. If we focus on beliefs, as a particular kind of thoughts, there is a huge amount of things we believe. For example, I believe that Madrid is the capital of Spain, that Paris is the capital of France, . . . , that two plus two equals four, that two plus three equals five, . . . , that orchids are beautiful, etc. I do constantly believe that two plus two equals four or that orchids are beautiful, but those thoughts only rarely come to the forefront of my mind. When they do, I possess the beliefs occurrently and the rest of the time only dispositionally. Whereas dispositional thoughts endure, occurrent thoughts do not. The traditional representationalist model of our memory system easily accounts for the difference between occurrent and dispositional thoughts. Schwitzgebel (2014) proposes that:

A subject S dispositionally believes P if a representation with the content P is stored in S’s memory or “belief box”,<sup>7</sup> and S occurrently believes P when that representation is retrieved from memory for active deployment in reasoning or planning – as soon as S moves to a different topic, the occurrent belief ceases.

These two distinctions have to be carefully differentiated. On the one hand, active deployment in reasoning is the criterion for distinguishing occurrent and dispositional thoughts. On the other hand, reportability is the criterion for distinguishing thoughts we have cognitive access to from thoughts we lack cognitive access to. Now, one might suspect that if certain content is retrieved from memory for active deployment in reasoning, then it is reportable and we have cognitive access to its content. This would make the class of a-conscious thoughts equivalent to the class of the occurrent thoughts. However, there are theoretical and empirical reasons for resisting this move.

A very popular view in psychology holds that there are two systems for reasoning – or at least two types of systems for reasoning (for a review and discussion, see Evans 2008): System 1 and System 2.<sup>8</sup> Despite the differences between dual-system proposals, they all have in common the distinction between cognitive processes that are fast, automatic and unconscious (System 1) and processes that are slow, deliberative and conscious (System 2). Very importantly for current purposes, the notion of consciousness in this distinction



is that related to cognitive access. As Evans remarks in his review of dual-system theories: “An operational definition of consciousness that seems to have appeared (often implicitly) in dual-process theories is that System 2 thinking requires access to a central working memory<sup>9</sup> system of limited capacity, whereas System 1 does not.” And more explicitly when he notes that “Consciousness is also closely associated with working memory in ‘global workspace theory’ – see Baars & Franklin 2003” (Evans 2008, 8–9).

System 1 and System 2 are supposed to make use, respectively, of non a-conscious and a-conscious thoughts. Now, if the distinction between occurrent and dispositional thoughts is made in terms of active deployment in reasoning, we can conclude that although a-conscious thoughts are occurrent, not all occurrent thoughts are a-conscious. In particular, those that take part in System 1 processes are occurrent, because they are deployed in reasoning, but not a-conscious. Dispositional thoughts naturally correspond to unconscious (phenomenally and otherwise) ones. Therefore, the interesting question is whether (at least) some occurrent but non a-conscious thoughts qualify for having phenomenology – as the defender of the cognitive phenomenology thesis is committed to maintain modulo the truth of a non-access theory of consciousness.

To understand the relevance of this question, let me introduce a third distinction, close to the ones already presented, between implicit and explicit thoughts.<sup>10</sup> The distinction is better understood by means of a clear example. I have one sibling and I believe so. I also believe that the number of siblings I have is fewer than two, and fewer than three, . . . , and fewer than five hundred, . . . It does not seem plausible that I have all these beliefs stored individually in representational format in my mind. Those beliefs are said to be implicit. Following Schwitzgebel (2014) , we can say that:

One believes *P* explicitly if a representation with that content is actually present in the mind in the right sort of way – for example, if a sentence with that content is inscribed in the “belief box”. One believes *P* implicitly (or tacitly) if one believes *P*, but the mind does not possess, in a belief-like way, a representation with that content.

This distinction is relevant because implicit thoughts are not suitable for having phenomenology. Phenomenology is an occurrent property of an occurrent mental state (Burge 1997; Kriegel 2005), but implicit beliefs do not qualify as such – as Schwitzgebel notes, many philosophers have the distinction between explicit and implicit thoughts in mind when they talk about occurrent and dispositional ones. In having an implicit belief that *p*, there is no occurrent representation that *p* toward which I bear the propositional attitude of belief. So, in that sense, it is not a thought I really entertain, and hence not a candidate for being a phenomenally conscious state.<sup>11</sup> But, it follows straightforwardly from the definitions above that nothing prevents explicit thoughts being either dispositional or occurrent. Thoughts involved in System 2 processes are explicit ones, because a-conscious thoughts are always explicit. But defenders of the cognitive phenomenology thesis require that (some) non-a-conscious thoughts are explicit. If System 1 thoughts were all implicit, their position would be jeopardized. One might observe that deploying a thought in reasoning requires explicitly tokening a representation of it. Therefore, if as defenders of dual-process theories maintain, System 1 thoughts are deployed in reasoning then they have to be explicit. However, it is unclear what would justify the claim that affecting reasoning requires explicit tokening of a representation, and more importantly, doubtful that all dual-processes theorist would endorse it.

Consider, for example, Frankish’s (2004) theory. He defends a dual-process theory on which System 2 – what he calls “supermind” – processes are a-conscious, linguistically



articulated and semantically valuable states of mind, whereas System 1 operates on the basis of non-a-conscious mental states that seem to involve little more than an encoding of information in a way poised to guide action (Toribio 2007). This kind of mental states can be understood as implicit thoughts or, as Frankish prefers, as a completely different natural kind. Either way, one might be reasonably suspicious that this kind of dual-process theory makes room for non-a-conscious explicit and occurrent thoughts that have phenomenology.

One might reach a similar conclusion by reviewing the empirical literature about the roles of System 1 and System 2. For example, Lieberman et al. (2002) have argued on theoretical grounds that full-fledged logical reasoning is limited to System 2 – what they call the “C” or reflective system. In favor of this hypothesis, DeWall, Baumeister, and Masicampo (2008) found that hampering System 1 with suppressed thoughts failed to impair reasoning, while DeNeys (2006) showed that occupying System 2 through high cognitive load caused decrements in logical reasoning. The relevant detail lies in the manipulation employed by DeNeys and colleagues for overloading system 1 – which follows the one developed by Wegner and Gold (1995) – based on Wegner (1994) ironic processing theory. According to it, thought suppression has two parts, one in which a non- (a-) conscious process scans the environment looking for cues that might evoke the forbidden idea, and a conscious suppression of such thoughts. Nonetheless, the unconscious process continues vigilantly scanning for unwelcome cues even after the conscious mind turns its attention elsewhere. Wegner and Gold had participants think of a past close relation that either was or was not still desired (hot vs. cold old flame) as their skin conductance level was measured, and then they instructed participants to stop thinking about him or her; that is, to suppress the related thoughts. This procedure frees up System 2 to solve logic problems (as in DeNeys et al.’s experiment) while the nonconscious system is still (somewhat) busy thinking about the old flame. After finishing the logic problem, an interview showed that the thought of the old flame remained highly accessible, which would indicate that the ironic processing had continued its work all along. In particular, those who still desired the relation experienced an increase in emotional arousal (*emotional rebound*) indicated by the increase in the skin conductance levels, whereas those who did not desire the relation anymore experienced a *cognitive rebound*, a rebound of thoughts related to the old flame, as indicated by their reports of their stream of consciousness. Once this is made clear, it is far from obvious that the alleged thoughts that have to explain the scanning processes that ironic theory postulates, and the emotional and cognitive rebound, require explicit representation of the old flame while the subject is solving the logical problems.

Summarizing, if non-access theories are true, as I am assuming in this paper, defenders of the cognitive phenomenology thesis are committed to the claim that there are phenomenally conscious states we lack cognitive access to. This, in turn, commits them to the existence of non-a-conscious explicit occurrent thoughts, for only explicit occurrent thoughts are candidates to be phenomenally conscious. The idea that there are occurrent thoughts that we lack cognitive access to is vindicated by dual-process theories. In particular, thoughts deployed in System 1 satisfy this desideratum. However, it is unclear whether thoughts deployed in System 1 processes have to be explicit, and also unclear if the mental states deployed in these processes are of right kind – the kind of mental states that can have phenomenology. We are faced with an empirical question: Are there non-a-conscious explicit occurrent thoughts? How can this question be studied? Answering this question is the purpose of next section.

### 3.2. Empirical problems

There is a *prima facie* problem if we want to investigate whether there are explicit occurrent thoughts to which we lack cognitive access. The reason is that if the subject lacks cognitive access to the thought, we cannot ask her about what she is thinking about, and we have to infer the kind of thought she might be undergoing from its behavior. But then, one can raise reasonable doubts about whether the thoughts that would account for such behavior require an explicit representation toward which the subject bears any attitude. In this section, I want to suggest that there is nonetheless empirical evidence that favors the claim that there are explicit occurrent thoughts we lack cognitive access to.

The first piece of evidence has been provided by Mandelbaum (2015) on the basis of implicit bias. (“Implicit” here is to be understood in the sense in which it is used in psychology; that is, as a synonym of non-a-conscious – see note 10. In order to avoid unnecessary confusion, I will keep using the terms “implicit” and “explicit” in the sense presented in the previous section and introduce the terms “implicit\*” and “explicit\*” for the typical use in psychology). Mandelbaum argues that, on the more than plausible assumption that implicit\* bias is caused by implicit\* attitudes, then such implicit\* attitudes are non-a-conscious occurrent (because they are deployed in reasoning) explicit (propositionally structured representations) beliefs. The reason is that, if implicit\* biases are implicitly represented, rather than explicitly, then we would expect them to be caused by some sort of association rather than by inference because inference requires explicit representation. This assumption is used by Mandelbaum to argue on an empirical basis that implicit\* biases are explicitly represented. The basic idea is that if implicit\* biases were implicitly represented, then they should be modulated by extinction or counterconditioning *but not* by rational argumentation – which relies on inference. However, the empirical evidence points in the opposite direction, showing that rational argumentation influences implicit\* biases. For instance – just to advance a couple of examples from the collection presented by Mandelbaum – Brinol, Petty, and McCaslin (2008) showed that implicit\* biases are sensitive to the strength of the arguments, and Sechrist and Stengor (2001) have showed that implicit\* biases can be adjusted depending on what one’s peers think of the topic at hand. If Mandelbaum’s reasoning is correct, then implicit\* biases depend on non-a-conscious occurrent, explicit thoughts.

I want to present a second piece of evidence coming from neuroscience following a similar strategy as the one I used in Sebastián (2014). Cognitive access to our conscious experience seems to essentially depend on sustained activity in the dlPFC (Dehaene and Naccache 2001; Fuster 2008; Lau and Passingham 2006). Although most of the evidence in favor of the claim that the dlPFC plays an essential role in cognitive access has been collected making use of visual tasks, few would doubt that this area is fundamental for having cognitive access to our thoughts. In particular, those who have researched the neural mechanism underlying a-conscious thoughts do not. Lieberman (2003) and Lieberman, Jarcho, and Satpute (2004) have identified two neurological mechanisms described as X- and C-systems, corresponding to System 1 and System 2. The X-system is composed of the amygdala, basal ganglia and lateral temporal cortex brain areas. On the other hand, the C-system involves the anterior cingulate cortex, the medial-temporal lobe (including hippocampus) and the prefrontal cortex *including the dlPFC*, for, as Lieberman, Jarcho, and Satpute (2004) note, System 2 “relies on symbolic representations, which are organized into propositions and processed serially *in working memory*” (422, my emphasis).

Now, as we have already seen, dlPFC is one of the most deprived areas during sleep (Braun et al. 1997; Maquet et al. 1996; Schwarz and Maquet 2002). But, do we undergo

explicit occurrent thoughts during sleep? Reports of the subject upon awakening suggest that we do. When individuals are woken during NREM sleep they report dreams only 5–10% of the time, in comparison with 80% of the time when waken during REM sleep. However, when subjects are asked about what was passing through their mind rather than about what they were dreaming, they describe mental activity about 50% of the time, and such mental activity tends to be similar to everyday thinking (Foulkes and Vogel 1965). Here is an example of such a report provided by Hobson (2005, 7):

I kept thinking about my upcoming exam and about the subject matter it will contain. I didn't sleep well because I kept waking up and was inevitably pulled back to the same rumination about my exam.

Although there is also an emotional component, reports recollected after waking subjects during NREM sleep, as this example illustrates, focus on thought, and support the claim that dreams in this period tend to be thought-like (Tononi 2009, 96).

If this is the case, then it seems reasonable to maintain that those are thoughts that involve fully propositional representation. It is on this basis that we report them upon awakening although they are not reportable (set aside muscular inhibition which is irrelevant for the notion of reportability that defines cognitive access), at the moment we entertain the thought – the reason being that we lack cognitive access to them, as suggested by the deactivation of dlPFC. This demands, as Windt (2015) notes, an explanation. Reports upon awakening cannot depend on the cognitive access we have to our thoughts at the moment we entertain them, but rather on other kind of memory system like long-term memory. However, this does not seem especially problematic. The only empirical commitment of my argument is that information can be encoded in long-term memory without going first through working memory. So that, upon awakening, information can be brought back from long-term memory to working memory thereby making the report possible.

In reply, one might attempt to resist the claim that subjects really undergo those episodes, alleging that they might be cases of false memories or confabulation (Dennett 1976; Malcolm 1959). However, it seems to me that this skeptical view about the reports of subjects upon awakening is left unsupported once we consider the evidence (reviewed in Sebastián 2014, see especially Horikawa et al. 2013), in support of the claim that subjects really undergo the episodes they claim in the case of visual experiences. Although one might coherently accept reports concerning visual experience but still be reluctant to accept reports regarding thoughts, this evidence provide *prima facie* support for taking the reports at face value.

One might also argue on a priori grounds against the idea of entertaining thoughts in dreams. Ichikawa (2009), for example, has argued that dreams do not involve beliefs. He contends that the episodes we undergo during sleep do not have the same functional role as ordinary beliefs because they lack connection with perceptual experience and fail to motivate actions. He argues that interpretationalist or dispositional accounts of belief speak against the view that the episodes we undergo during sleep, and on which basis we report upon awakening, are beliefs. I have two things to say in reply. In the first place, it has to be noted that, if propositional attitudes are mere dispositions, then the cognitive phenomenology thesis does not get off the ground, because there is no occurrent state in the mind to which phenomenology is attributed – see note 11. Second, once we assume a representationalist framework, Ichikawa's reasoning poses no threat to mine. Even if the episodes we undergo during dreams are not beliefs, they would still entail explicit representations toward which we bear an attitude (which might not be that of believing). This is

enough to show that there are non-a-conscious occurrent explicit thoughts, as the defender of cognitive phenomenology requires.

I want to finish by briefly speculating that the truth of a non-access theory of consciousness might, in turn, provide some support for the cognitive phenomenology thesis.<sup>12</sup> Let me start by noting that we cannot retrospectively report thoughts that take part in System 1 processes – like, for example, the thoughts underlying the ironic processing described at the end of Section 3.1. One possible explanation thereof is that thoughts that take part in System 1 processes are merely implicit thoughts. Now, if Mandelbaum is right, this cannot be the right explanation. The reason is that implicit\* attitudes are occurrent explicit thoughts and the processes that operate on their basis are of the System 1 type, for we lack cognitive access to them and they are fast and automatic.<sup>13</sup> Although sometimes we might infer and tell that an implicit\* attitude was underlying our behavior, we fail to have retrospective cognitive access to them: we cannot, non-inferentially, report implicit\* attitudes, neither at the moment that it is deployed in reasoning nor later on. Things are different in the case of dreams. Despite our lack of cognitive access to the thoughts we undergo in dreams, we can report on them upon awakening. As we have seen, if during dreams we undergo explicit occurrent thoughts we lack cognitive access to, then – considering that we can report on them upon awakening – they have to be encoded in long-term memory without going through the working memory. This difference demands an explanation. I would like to make two suggestions in search for an answer, the second being more speculative than the first:

- 1 Thoughts we undergo during sleep are of the same kind as the thoughts that participate in System 2 processes: cognitive access is not constitutive of them.
- 2 Phenomenology is what distinguishes the thoughts that participate in System 2 processes from those that participate in System 1 processes.

System 2 processes are reflective and deliberative and we have cognitive access to those processes. This does not require that the thoughts that take part in System 2 processes are constitutively thoughts we have cognitive access to, only that we have cognitive access to them when System 2 processes take place. In fact, the brain areas tagged by Lieberman and colleagues as responsible for System 2 processes remain active during sleep with the exception of those in the prefrontal cortex associated with working memory and executive processes. Now, as there are good reasons for doubting that those processes take place in (non-lucid) dream, there is no *prima facie* reason for doubting the truth of *i*. One can appeal to a difference in kind to explain why we can retrospectively and non-inferentially report the thoughts we have in dreams but not our implicit\* biases despite the fact that both are non-a-conscious. However, if both are occurrent and explicit more needs to be said in order to provide a characterization of their difference in kind.

Defenders of the cognitive phenomenology thesis have a response ready at hand: System 2 thoughts are, and System 1 are not, phenomenally conscious. An analogy with the case of sensory states might help to back up this claim. If a non-access theory of consciousness is true, then we can distinguish sensory states we have and sensory state we lack cognitive access to. However, contrary to fully unconscious states, we sometimes can retrospectively and non-inferentially report on them, as the visual experiences we undergo during dreams illustrate. The difference between those we can report on and those we cannot is that the former but not the latter are phenomenally conscious. Despite the fact that both might be stored in long-term memory, only those with phenomenology can be retrieved for report – phenomenology would be a necessary yet not sufficient condition

for reportability (retrospective or otherwise). Surely, in order to take this speculative suggestion into more serious consideration, further work is required connecting phenomenology and retrospective reports. One possible way forward for it might be found if phenomenology is built into episodic memory,<sup>14</sup> on which basis we seem to report the episodes we were undergoing during sleep. Although the goal of fully establishing this connection – beyond intuition – lies beyond the scope of this paper, one can point to the fact that episodic memory is said to entail an intimate, direct and immediate sense that “I” experienced the event (Moscovitch 1995; Vandekerckhove 2009; Wheeler, Stuss, and Tulving 1997; Zahavi 2005). This *autonoetic consciousness* is arguably grounded in the subjective character of experience or pre-reflective self-consciousness (Prebble, Addis, and Tippett 2013; Zahavi 2005); in the fact that experiences are “characterized by a quality of *mineness* or *for-me-ness*, the fact that it is I who am having these experiences” (Gallagher 2000).<sup>15</sup> In this case, if *autonoesis* is constitutive of the episodic memory and pre-reflective self-consciousness constitutive of phenomenology (Sebastián 2012; Gallagher and Zahavi 2006; Zahavi 2005), the link would be settled.

If this suggestion is sound, the same might be true in the case of thoughts. System 1 thoughts are fully unconscious. Thus, episodic memories are not formed on its basis and they cannot be retrieved back into working memory for report: we cannot remember ourselves as undergoing those thoughts. System 2 thoughts, on the other hand, would have phenomenology and we can form episodic memories on their basis.<sup>16</sup> Hence, although we might lack cognitive access to them, as the case of dreams illustrate, they can be retrieved into working memory upon awakening – when the corresponding mechanisms are reactivated – making report possible: subjects can remember themselves as undergoing those thoughts during sleep.

#### **4. Conclusion**

If the mechanisms on which cognitive access depend are not constitutive of phenomenology, then a mental state does not become phenomenally conscious in virtue of being poised for report, belief forming and rational control of action. If encoding in the GWS is the categorical basis of this dispositional property – being poised for report – then we can say that mental states do not become phenomenally conscious by virtue of being encoded in the GWS. This is true for sensory states but also for any other kind of mental state suitable to have phenomenology, including thoughts. This seems to jeopardize the cognitive phenomenology thesis because it is not clear that the notion of a phenomenally conscious thought we lack cognitive access to is coherent.

In this paper, I have argued that it is perfectly consistent in two steps. First, I have showed that the notion of occurrent thought, a thought currently deployed in reasoning, is independent of the cognitive access we have to the mental state, as dual-process theories defend. However, one can reasonably doubt that such thoughts are suitable states to have phenomenology, for they might be merely implicit thoughts. To address this worry, I have discussed empirical evidence that suggests that there are explicit thoughts we lack cognitive access to, as the defender of cognitive phenomenology thesis is committed to hold. Of course, this does not show that the thesis is true but shows that its defender has nothing to fear from the distinction between cognitive access and phenomenology, as it *prima facie* seemed. Moreover, as suggested in the last section, the fact that we can report on thoughts we lacked cognitive access to at the moment we entertained them – as allegedly happens in NREM episodes – points to phenomenology as a plausible candidate for explaining this fact in favor of the cognitive phenomenology thesis.

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### Notes

1. Sometimes the word “thought” is used to refer to cases in which we merely entertain the proposition without bearing any further attitude toward it. If this were possible (see Mandelbaum 2013 for an argument to the effect that there are no such cases, and that whenever we entertain a proposition we believe it), then thinking a proposition (merely entertaining a proposition) would be a particular case of thought, in the sense in which I am using the term in this paper.
2. The distinction between access and non-access theories corresponds to what I have called, following Fahrenfort and Lamme (2012), “cognitive” and “non-cognitive theories of phenomenal consciousness” (Sebastián 2014). All things considered, I find the term “access theories” to be more appropriate; moreover, in the present context it avoids unnecessary confusion, as we are dealing with cognitive phenomenology.
3. Proponents of GWS often intend it as a theory of phenomenal consciousness denying the distinction between cognitive access and phenomenology (Baars 1988).
4. One might think that it would be more precise to say that by virtue of the mechanisms underlying the cognitive access we have *to its content*. In order to avoid unnecessary complication in the exposition, I will keep using the expression “having cognitive access to a state”, rather than “. . . to its content”. I intend this expression to be neutral on whether we have cognitive access to something beyond the content. For example, we can come to know whether we perceive that there is a cup on the table rather than believe or hope that there is a cup on the table; if those states have the same content, then we would have cognitive access to something beyond the content. Nothing in my argument (phenomenology aside) hinges on these details.
5. More precisely, those encoded in the very fragile short-term memory that roughly correspond to the iconic memory once the contribution of retinal persistence is eliminated (Block 2011).
6. One might worry, as a referee has suggested, that different kinds of mental states might acquire phenomenology through different mechanisms. For example, it might be that certain visual states become phenomenally conscious through, say, certain visual–cortical mechanisms, while encoding in the GWS is what produces the distinctive phenomenology of thoughts. The problem is that some perceptual states are also encoded in the GWS and they would thereby have the kind of phenomenology that encoding in the GWS allegedly provides. As a result, the cognitive phenomenology thesis would turn out to be false, because the phenomenology of thoughts would not be proprietary. Alternatively, one might claim that thoughts get their phenomenology in virtue of being encoded in the GWS but not so perceptual states. In the absence of independent motivation or empirical support, this alternative seems completely wanting.
7. A subject is said to have a representation of the proposition P stored in the “belief box”, when it is apt to be deployed in ways we regard as a characteristic of belief; for example in theoretical inferences toward which it is relevant.



8. See, for example, Evans (2006), Epstein (1994), Fodor (1983, 2001), Lieberman et al. (2002), Lieberman (2003), Stanovich (1999, 2004) and Wilson (2002). For discussion on the relation between dual system theories and an alternative view like the massive modularity hypothesis, see Eraña (2012).
9. For a discussion of the relation between GWS and working memory, see Shanahan and Baars (2007), Block (2007b) and Sebastián (2014).
10. In psychology, the terms “explicit” and “implicit thoughts” often correspond to that between what I have called a-conscious and non-a-conscious thoughts, where implicit thoughts are those we do not recognize ourselves as having. See, for example, Evans and Over (1996).
11. In this discussion, I am assuming, as it is typically done in the literature, a representationalist theory of beliefs in particular and thoughts in general. It is worth stressing that, for the reasons just mentioned, if a dispositionalist or interpretationalist theory of belief – and other propositional attitudes – were true (see Schwitzgebel 2014 for a review), then the cognitive phenomenology thesis hardly gets off the ground.
12. For an independent argument in favor of the cognitive phenomenology thesis based on the distinction between phenomenology and cognitive access, see Jorba and Vicente (2014).
13. Mandelbaum (2015) criticizes the idea that bands together System 1 processes and association. In my introduction of System 1 processes, I have carefully left out this feature for as Evans (2008) also notes: “while the notion that System 2 is in some sense ‘rule-based’ is compatible with the proposals of most dual-process theorists, the characterization of System 1 as associative is not.” (13)
14. I am grateful to an anonymous referee for this suggestion.
15. For further discussion on the relation between pre-reflective self-consciousness and auto-noesis see, for example, Vandekerckhove, Bulnes, and Panksepp (2014).
16. Note that this thesis can be, in principle, accepted by those who reject the cognitive phenomenology thesis; for they can appeal to non-cognitive phenomenology to explain this fact. However, although there is an emotional component in the episodes we undergo during NREM sleep, this seems to be insufficient for grounding the memories on which basis we report upon awakening. Opponents of the cognitive phenomenology thesis can also appeal to other sensory phenomenology. It is unclear to me that this is consistent with the patterns of neural activation in NREM, but a complete assessment of such a reply will depend on its details.

### Notes on contributor

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