SELF-CONSCIOUSNESS: EXECUTIVE DESIGN, SOCIOCULTURAL GROUNDS

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1. INTRODUCTION

I begin with the main hypotheses of this paper, preview the argument and then proceed with the demonstration. The main hypotheses are the following:

- self-consciousness (to be defined shortly) evolves historically and develops ontogenetically out of the joint work of a network of executive abilities (hence its executive design)

- in response to social, cultural and political pressures, typical of primate and particularly human ontogeny, these executive abilities are recruited and networked to do their joint work by an intuitive psychology that regulates one's mental and behavioral relations to others and later oneself (hence the sociocultural grounds of self-consciousness)

- the asymmetric development of self-consciousness builds upon the asymmetric development of intuitive psychology; human self-consciousness develops first in an outward or extrovert direction, toward other minds, their actions and the world, and later inwardly or introvertly toward one's own mind and actions; in other primates, self-consciousness is likely to remain extrovert, reflecting the exclusive orientation of their social cognition or rudimentary intuitive psychology

- the executive structure of self-consciousness is a prerequisite and platform for the phenomenal (what-it-is-like) manifestation of consciousness

Two subsidiary hypotheses should also be noted.

• construed executively, on the shoulders of an intuitive psychology that responds to strong sociocultural and political pressures, self-consciousness is likely to reflect the work of a complex and diverse mental machinery and thus likely to be a rare commodity on the evolutionary market, possibly present only in the minds of primates and other intensely sociopolitical species (dolphins, elephants and the like)

• in contrast, the roots of phenomenality, construed as sentience, reach deeper into the phylogeny of animal nervous systems but are likely to develop conscious branches only when engaging relevant executive abilities and often for the duration and extent of such engagement -- whence the likelihood of a pulsative and intermittent form of self-consciousness in human infants, some other species and probably brain-damaged human adults

The argument for these hypotheses unfolds in two parts. The first part aims to establish a tight correlation between the joint work of executive abilities and the manifestation of self-consciousness. The second part aims to explain this correlation by identifying its reasons and the mechanism through which those reasons design conscious minds. The reasons are sociocultural and political and the chief designing mechanism is intuitive psychology (also known as theory of mind or mindreading). The designing process is eminently developmental in the sense of responding to specific pressures of human ontogeny. Even though conscious phenomenality is not on the present agenda, two sections discuss how an executive account of self-consciousness may help redraw the contours of phenomenality.

The main argument summarizes some (though not all) of the basic themes of my book, OUR OWN MINDS (2010), but also ventures in some new directions. To save space, I kept references to a minimum.

A word about the strategy of my inquiry. Unlike many accounts of consciousness, I chose not to start from intuitions about how phenomenality appears or feels from inside, or from speculative models, such as inner sense or introspection. My data-driven strategy has been to look for the strongest correlations I could find between empirical data, mostly

neurological, clinical and developmental, on the one hand, and the presence, absence, impairments and degrees of consciousness, on the other hand, and then to look for the strongest reasons for these correlations. What follows is a report on this search.

2. WHY CONSCIOUSNESS IS NECESSARILY SELF-CONSCIOUSNESS

Intuitively, consciousness always looks relational: we talk of being conscious of something or conscious that something is the case; it is hard to think of cases where one is simply conscious (full stop) and one's consciousness is contentless. This is to say that consciousness is necessarily intentional (in the philosophical sense) or target-related, as I prefer to put it. This is the necessity of our commonsense concepts. But there is a deeper factual reason why consciousness is not only target-related but necessarily consciousness of self-to-target relatedness. I abbreviate the latter as <u>self-consciousness</u>.

The factual reason is that mobile organisms are goal-directed, in the sense that they have targets at which their mental states and actions are directed, and they must self-regulate their mentation and actions to be successful in tracking and reaching their targets. Self-regulation is the work of mechanisms that distinguish events inside from events outside organisms (self-determination) and monitor, control and guide their relations to targets (self-guidance). The joint work of these two kinds of mechanisms provide an organism with a <u>sense</u> of self-to-target relatedness (self-intentionality) and its affordances. It is a sentient, subpersonal and unconscious sense that results from the work of specialized mechanisms, mostly perceptuomotor.

The lead question of this paper is in what conditions and for what reasons this sentient sense <u>becomes</u> conscious, as consciousness of self-to-target relatedness or simply self-consciousness.

3. STRONG CORRELATIONS: BLINDSIGHT AND OTHER BRAIN CONDITIONS

As a case of unconscious vision in the blind field, blindsight offers a

striking example of correlation between consciousness and executive abilities operating in the visual mode. A blindsighter is not conscious of the scene in the blind field and of seeing or being visually related to the scene. Only when prompted by an experimenter does a blindsighter recognize, in a perceptuomotor mode and often much above chance, various objects in the blind field, including their size, shape, use and even color. In the blind field the blindsighter can also navigate the environment successfully and use his hands for fine-tuned actions, such as grabbing an object and inserting a credit card or key in a lock (Milner and Goodale 1995).

The blindsighter unconsciously registers, processes and responds to perceptual stimuli in the blind field. We can regard this ability as visual sentience -- an unconscious visual awareness or experience of the physical environment and of one's behavior in it. Blindsight suggests that a good deal of perceptuomotor mentation and behavior are successfully regulated (i.e., guided, monitored and adjusted) and managed with diminished or absent consciousness.

Unconscious sentience is manifested in other forms as well. These are cases where consciousness is severely impaired or even absent, and yet a state of wakefulness and minimal attention are present. One such case is epileptic automatism, in which, during the seizure, the patient remains awake, minimally attentive and able to register objects and events, and even navigate space successfully, yet shows no sign of consciousness. Another case is that akinetic mutism, which is lack of movement and speech, again associated with minimal attention and reaction but with little or no sign of consciousness. The patients may be like blindsighters, lacking consciousness, yet awake and able to operate, cognitively and behaviorally, under the exclusive impact of external stimuli. The same is true of normal people who are confused or drowsy or in people who are comatose or vegetative or subject to petit mal seizures. The more mundane absent-minded behavior (when walking or driving) can also be added to this list (Damasio 1999).

What do these cases tell us about self-consciousness? Is there a common denominator that may shed light on its nature and prerequisites? The next section ventures a first answer.

4. EXECUTIVE ABILITIES

Let us take a closer look at blindsight. On his own, a blindsighter has no intent to act, no means-ends initiative that deploys and animates the intent, no top-down attention, monitoring and control over what is registered unconsciously in the blind field and the ensuing actions. Nor does the blindsighter's perceptuomotor capability broadcast information from the blind field to other mental faculties, such as thinking, remembering and planning, or have these faculties interact and cooperate in guiding further thought and action.

The italicized words refer to high-level executive abilities, most of them located in the prefrontal cortex, which handle information as well as mental and behavioral activities. There are other high-level executive abilities at work in normal conscious mentation (but absent in blindsight, absent-mindedness and the clinical cases noted earlier), such as multitasking, deliberate memory search, deliberate anticipation or mental rehearsal and deliberate metacognition. The deliberate use of these executive abilities is what makes them high-level and indicative of the work of an active (as opposed to merely reactive) mind.

Since a blindsighter can engage the blind field successfully in movement and other actions, as does the absent-minded driver in relation to the road, we must assume that low-level executive abilities guide their actions unconsciously through visuomotor coordination as well as monitoring and control of movement. It appears then that a high-level executive machinery correlates with self-consciousness but a low-level one need not. I think the former correlation is deep, systematic and explains which minds can be self-conscious, at what level of mental complexity, and with what direction of target-relatedness (world, actions, minds, of others or one's own).

5. DEVELOPMENTAL ASYMMETRY

We get closer to what I think best explains the tight link between high-

level executive abilities and self-consciousness by examining the asymmetric development of self-consciousness in human ontogeny. A strong case can be made that children's self-consciousness is outwardly oriented or extrovert in the first four years or so, after which it gradually turns inward as well and becomes mind-directed or introvert. The evidence for extrovert self-consciousness can be found in the outward orientation of several key mental faculties and the absence of high-level executive abilities involved in introvert mentation.

Until around 4, the mentation of children is mostly online, perceptuomotor, input-driven and situated in the here and now of perception, motivation and action. Even mental departures from reality, as in pretend play, are rooted in perceptuomotor models of thought and action. The dominant modalities in which young children engage the world are communicational, affectuomotor and perceptuomotor. In all three, the motor component and its world-directedness are essential. The motor component also reflects the dominance of mostly procedural mental schemes whose outputs are rarely available to higher-level processing and high-level executive abilities.

Young children's memory is semantic (about facts) and episodic (about past experiences) but not self-oriented or autobiographical. As revealing proof of limited offline mentation, the youngsters' mental imagery is poor, schematic and largely passive. Importantly for the later argument, their intuitive psychology is about other minds, not their own. Finally, and not surprisingly, their introspection is not yet in place (Bjorklund 2005; Nelson 1996).

The high-level executive abilities of young children also have an external orientation. What they intend, mentally rehearse, pursue in a means-ends format, multitask, metacognitively monitor and broadcast as information to various mental faculties is managed online and mostly in the service of immediate communication and action.

Conversely, none of the high-level executive abilities associated with intramentation and introvert self-consciousness are developed and operative before 4 to 5. I am thinking of inhibition of current perception and motivation, a capacious working memory, extended mental rehearsals as well as offline intending, metacognition, top-down attention and monitoring, and

autobiographical recall. The development of this set of executive abilities after the 4 to 5 interval is associated with an increasingly active intramentation and an introvert range of self-consciousness (Bjorklund 2005).

The facts cited so far provide strong evidence of an extrovert self-consciousness in the first four to five years of life and an introvert version after that, both correlated with high-level executive abilities operating first extrovertly and later introvertly. Is there a deeper explanation for these developmental correlations? I think there is such an explanation. It will take some background and theoretical footwork to set it up.

6. THE DEVO-EVO ANGLE

To put my explanation in the right perspective, it is worth recalling that most animal and human mentation is unconscious and that consciousness itself has been recently under attack as being epiphenomenal or arriving too late at the scene of thinking and deciding, so to speak. Furthermore, blindsight emphatically suggests that action-bound mentation can be managed well unconsciously. Or most animal mentation and that of young human children is action-bound. Why, then, would some forms of mentation evolve consciousness at all? Or, in terms of my analysis, why and how would high-level executive abilities be recruited and orchestrated to generate self-conscious minds?

The answer to this question must be carefully framed. The evolutionary installation of most mental skills and bodily organs takes place in two complementary phases -- one historical, another developmental. Reaching far into the past, the historical phase selects for and installs innate predispositions; the developmental phase finishes the installation either by stimuli-driven maturation, as in most bodily organs and some mental skills, or by having domain-specific inputs activate and adjust the innate predispositions to the specific coordinates of the domain, as in the case of several mental skills. A standard example of the latter sort is the phonetics and grammar of natural languages. Their universal core predispositions have a likely historical pedigree of selection, yet it is in early

childhood that these predispositions take specific values relative to the linguistic environment in which a child happens to grow up.

The installation of self-consciousness also spreads over two stages, historical and developmental, but with a unique twist, I think. The installation is the outcome of selection acting historically on human ontogeny itself. To understand this process is to understand ontogeny in evolutionary terms, subject to ontogeny-specific selection forces. It is development construed as evolution, or devo-evo, in short. In several works I argued that, so construed, human ontogeny is likely to be responsible for some uniquely human mental competencies, such as reflexive thinking or thinking about one's own thoughts, predicative thinking and imagination (Bogdan 2000, 2009, 2013, forthcoming). Self-consciousness should be added to this list, as I argue in (Bogdan 2010) and below.

What is it about human ontogeny, viewed from an evolutionary angle, that would explain the emergence of self-consciousness, first extrovert and later introvert? What selection pressures would force such a developmental outcome, in such an order?

Paradoxical as it may seem, the answer I propose is that the selection is not for self-consciousness as such but rather for what makes it possible -- namely, a cluster of high-level executive abilities assembled, networked and deployed by children's developing intuitive psychology, in response to strong interpersonal and cultural challenges in early childhood and sociopolitical challenges (competitive as well as cooperative) later in childhood. Those challenges are the reasons for the development of self-consciousness. The executive abilities harnessed by children's intuitive psychology to meet these challenges are the roots of self-consciousness, its platform. I elaborate, beginning with the reasons and their phylogenetic pedigree.

7. SOCI0POLITICAL GROUNDS IN PRIMATES

It is well-known that the mentally sophisticated species are those with intense, complex and fast moving sociopolitical relations, involving competition and tactical alliances as well as cooperation and personal affinities. Primates, cetaceans, perhaps elephants are the most notable

examples. To manage such relations and regulate their mental states and actions in the sociopolitical domain, these species evolved elaborate forms of social cognition and possibly, at least in some primates, rudiments of intuitive psychology. To do their work effectively, these competencies in turn recruit and orchestrate a variety of mental abilities, among them executive abilities whose joint exercise could (on my analysis) generate a propensity for (extrovert) self-consciousness.

Frequent tactical alliances and acts of deception have persuaded many researchers that chimpanzees are capable of some relational thinking, problem solving by trial and error, memory of individual conspecifics and their behavioral tendencies as well as memory of favors extended and received, also gaze following, prediction of behavior and some planning. Closer to our story, in engaging in such mental exploits in the sociopolitical domain, the same minds are also viewed as capable of exercising such executive abilities as mental rehearsal and means-ends initiative, top-down attention and control of action, some multitasking and sharing of information among several mental faculties (Tomasello 1999).

According to the analysis and examples of earlier sections, the joint work of such high-level executive abilities could produce in apes an extrovert self-consciousness. The latter is likely to operate mostly or even only in the sociopolitical domain and possibly only as long as the duration of specific challenges -- a sort of intermittent or pulsative consciousness. Other domains of primate activity, such as hunting, gathering food, mating, parenting, or using simple tools from time to time, could be handled on automatic or blindsight-like pilot, without necessarily involving the high-level executive underpinnings of self-consciousness.

Humans are at least as intensely sociopolitical as other primates and yet their self-consciousness is likely to be different: it is constantly on, while awake, operative in domains other than sociopolitical and developing in later childhood an introvert version that becomes a permanent fixture of their mental life. What explains this difference?

My answer points to human ontogeny, understood in a devo-evo sense, with its unique selection forces timed to act on a different schedule and with different domains than those found in the ontogenies of other primate and sociopolitical species. This is the hypothesis I elaborate next.

8. EARLY ONTOGENY: THE EXTROVERT PHASE

Human infants begin their life prematurely and hence in a very immature, helpless and prolonged adult-dependent mode. To some extent, other comparable species share this ontogenetic predicament but not how it unfolds and is managed by adults and their culture and how children in turn respond. The very sequencing of the mental challenges human children face in the social and cultural domains is unique. The first months are spent in intense bilateral interactions with adults, then the next three years are dominated by trilateral children-adults-world assimilation of cultural basics (language, gadgets, shared modes of communication and behavior) and only after 4 there is a full entry into the world of peer and adult sociopolitics. Starting by figuring out other minds, their culture and language, before actually facing the tough demands of physical and sociopolitical survival is a radical novelty of human ontogeny, with unprecedented and immense mental consequences. I will sample a few revealing moments of this mental ontogeny.

The minds of human infants begin operating on two tracks. Reflecting their utter helplessness, the first track is bilaterally coregulative: the infant interacts with an adult, usually mother, to coregulate physiologically vital but still vulnerable bodily processes (metabolism, thermoregulation, etc.) and later to coregulate psychologically emotions, affects and other mental states. The latter coregulation enables infants to detect (what I call) mental invariants behind various overt expressions (vocal, facial, behavioral) of adult emotions and other mental states and their orientation, initially toward infants, later toward the world as well. Infants thus acquire a sense of mental states in others, which is a potent and unique platform for the development of intuitive psychology as a coregulatory enterprise.

The other track, shared with offspring of other species, is trilaterally goal-directed and imperative: infants want things from adults or things in the world by way of adults. The evolutionarily clever strategy of human parenting is to force and habituate infants to pursue their imperative goal strategies by way of adult-directed psychological coregulation, first in the already

familiar terms of exchanges of emotions and affective reactions and later in terms of representations of world-directed attitudes, such as attention, desires, beliefs and so on (Bogdan 2000, 2009).

Given the intense adult-dependence of early childhood and the adult mediation of children's entry into and mastery of culture, language, communication and social norms, the developing intuitive psychology thus becomes the main regulator of children's interactions with others and of their others-involving goal strategies in general. It is in this regulatory capacity and during its development, alongside that of other mental skills, that intuitive psychology recruits, orchestrates and deploys in its operation a variety of high-level executive abilities that end up as a platform for self-consciousness.

Before illustrating this process, I note that, unlike most comparable accounts, which I deem too spectatorial, I view intuitive psychology as an active and interventionist practice, in the service of one's goal strategies, which not only detects and conceptualizes mental states but also does something with or about them -- where the doing may involve reacting in some way, activating some action scheme, reenacting some cultural script, and so on (Bogdan 1997). It is in this role of active practice that intuitive psychology is in general a mind designer and in particular employs high-level executive abilities, with implications for self-consciousness.

To take just one notable instance, with major impact on mental development, consider shared attention in the second year of life. Shared attention entails registering, interacting with and directing the mental and behavioral states of others relative to a shared target and environment. To handle executively the many tasks involved a child must intend to influence an adult's attention and perhaps action, use her gaze and perhaps gesture as a means-to-ends initiative, exercise control over the ensuing interaction, react and adjust to the resulting feedback from the adult, and more. These, on my analysis, are high-level executive abilities that install self-consciousness of an extrovert sort at this stage. The installation is enhanced when the shared targets -- people, objects, events -- are embedded in rich and fast-changing sociocultural contexts that call for an even wider range of consciousness-building executive abilities.

9. LATER ONTOGENY: THE INTROVERT PHASE

Just as an intuitive-psychological understanding of other minds drives the development of extrovert self-consciousness in the first four years by way of an outward-looking executive machinery, the new understanding of one's own mind or self-understanding is going to drive the commensurate development of introvert self-consciousness after the age of 4 by way of an inward-directed executive machinery. This is the hypothesis that guides the analysis that follows.

Two (possibly related) developments conspire to turn intuitive psychology toward children's own minds. One development is cerebral, centering around a major growth in the prefrontal cortex and in the interconnectivity handled mostly by the right hemisphere. This development offers dramatically new executive opportunities for mentation, ranging from the inhibition of current motivation and perception, self-control and internal metacognitive supervision to a considerable expansion of working memory, as the workspace where multiple hierarchical or sequential can be maintained, manipulated and flexibly integrated in various formats (Diamond 2001). From this new executive platform, offline, intramental thinking is on the mental horizon of older children and so is potentially their introvert self-consciousness.

What turns this potential into mental reality? The answer I favor is a new sociopolitical environment, with new challenges, which older children manage with a more sophisticated and self-sensitive intuitive psychology. Consider, for illustration, a brief list of new mental activities that older children often initiate and gradually become better at managing: rehearsing what to say and what to do socially; thinking how others think of you; planning how to relate to others and how to react to their reactions; deliberate and planned lying; self-involving gossip; justifying publicly one's motives and actions; autobiographical narratives; self-advertising; interpersonal diplomacy; and so many others such self-regarding exploits, along the same lines. (Sounds familiar? It becomes the stuff of regular adult mentation.)

These mental activities reflect a growing competence to strategize

(as we may call it) by imagining and thinking offline about the mental states and attitudes others and self in pursuing one's goals. (Strategizing also drives the development of children's offline imagination (Bogdan 2013 and forthcoming).) Strategizing requires regulating one's goal policies through a carefully choreographed amalgamation of mental states and attitudes ascribed to others and oneself. This regulatory role is again played by intuitive psychology, now capable of ascriptions of more complex attitudes directed not only at other minds but also at one's own. And this regulatory role cannot be effectively discharged in strategizing and other sociopolitically oriented mental activities without engaging, assembling and coordinating the newly self-directed executive abilities noted a few paragraphs ago.

10. INTERIM SUMMARY

Before exploring some implications of my analysis, I will summarize the argument so far:

- clues from blindsight, absent-mindedness and clinical cases suggest a systematic correlation between high-level executive abilities and self-consciousness

- the explanation of this correlation, focused on the interplay between sociocultural and sociopolitical pressures on and during ontogeny and their management by a developing intuitive psychology, has been unpacked as follows:

sociocultural and later sociopolitical activities --> means-ends mentation --> interpreting mental states and attitudes of others and later of self in an active mode as instruments of self-regulation and in the pursuit of one's goal policies --> activating, assembling and orchestrating online and later offline executive abilities that --> create the functional platform of extrovert and later introvert self-consciousness

11. PHENOMENALITY WITHOUT CONSCIOUSNESS

The phenomenal or experiential or qualitative or what-it-is-like side of self-consciousness is not central to my analysis. Nevertheless, the analysis has some implications, perhaps revisionary, for how phenomenality and its link to self-consciousness are to be understood. This section breaks the link while the concluding one retools it. I start on a terminological note.

The Oxford English Dictionary takes "the state of being conscious as a condition or concomitant of all thought, feeling and volition" (my emphasis). In my analysis the "concomitant" is actually a network of executive abilities that engage "thought, feeling and volition." The same dictionary notes that the ancient Greek word 'phainomenon' refers to "a fact or event that appears or is perceived by one of the senses or the mind." Nothing is said about consciousness -- a very wise anticipation.

My analysis agrees with these dictionary explications. Literally speaking, as appearances to the senses or the mind, phenomena need not be conscious. Phenomenality need not entail consciousness. There is unconscious phenomenality. Blindsight is one striking example and so is absent-mindedness. There is unconscious phenomenal experience. It is called sentience.

On my view it is only when phenomenal sentience is engaged by a network of high-level executive abilities, in childhood, that phenomenal consciousness emerges as a durable disposition. Mere phenomenal experience reflects the work of the nervous system. The network of high-level executive abilities provides the matrix in which phenomenal sentience turns conscious. When the executive matrix is work-in-progress or less than complete, as in early ontogeny, or partially damaged, as in clinical cases, phenomenal consciousness -- the conscious side, not the phenomenal -- is likely to be pulsative and intermittent.

In the order of nature, then, I see phenomenal sentience as prior and widespread in organisms with a nervous system but conscious phenomenality as much less frequent in animal phylogeny and only associated with high-level executive abilities, whose evolution and joint operation are best explained by the strongest and most persistent pressures on animal minds, those of the

assimilation and practice of sociopolitics and culture. If what-it-is-like is just phenomenal sentience, then its explanation is no different from that of blindsight and belongs to neuropsychology. If the bat could speak, it would probably not tell us more than the blindsighter would, namely, that it sees or experiences nothing, even though it actually does, even phenomenally. But if what-it-is-like is conscious phenomenality, then (on my analysis) the bat does not have it and therefore there is nothing-it-is-like-to-be-a-bat.

12. EXECUTIVE BINDING

The reader may have wondered, as I do, about what would explain the assembly and networking of high-level executive abilities, with self-consciousness as a result. My explanation, we recall, invoked sociocultural and sociopolitical pressures on growing children, in self-regulatory response to which their developing intuitive psychology does the assembly and networking. But why? Why respond by way of assembling and networking executive abilities? Think of this as the executive binding problem. It may help to understand it by considering other binding challenges faced by animal and human minds.

One such challenge is the binding of mental representations: it consists in constructing coherent and stable representations of objects, properties, and other items out of fragmentary, partial, and transient stimuli in one or several sensory modalities. Human vision, for example, begins with retinal excitations that pick up proximal light patterns, and ends up with coherent images of (say) trees and houses. The binding problem here is how vision manages to bring together and integrate, in successive computational steps, disparate encodings of various pieces of visual information into a final representation of a recognizable object. The evolved solutions, for various species, are likely to reflect pressures and constraints on what an organism must frequently recognize and judge in order to act effectively on. For an insect, the visual recognition of a two-dimensional color of a given size and shape may be enough to cause fleeing or approaching behavior; for a squirrel the visual recognition of a three-dimensional object of specific size, color and volume may be necessary to grab it and bring it to its mouth; and so on. The

point here is that as many features of the input are bound together as required for the cognitive processing that guides action.

Moving on, another binding problem, which depends on the solution to the first, concerns the binding of judgments. This is the problem of how to bind representations of objects, properties, agents, actions and events into structured judgments that guide further cognition and action. Minds conjoin or sequence representations of objects and properties or of objects in some relation in order to represent structured facts and events in the environment. Human minds solve the problem of binding judgments differently from other animal minds, with possible consequences for self-consciousness, but I will not pursue this theme here (Bogdan 2009).

Judgments are animated, linked to other judgments, supervised throughout this process and fed into communicative acts and actions by executive abilities. For predominantly perceptuomotor animals, these are low-level executive abilities operating in relatively limited patterns and according to set routines and action schemes. As noted earlier, primate sociopolitics and the human children's immersion in and mastery of human sociopolitics, culture and linguistic communication require an integrated battery of high-level executive abilities in order to handle the relevant tasks adaptively.

Given the avalanche of novelties in all these domains, constantly assaulting young minds, one would expect the emergence during ontogeny of a durable dispositional readiness of high-level executive abilities to bind together in order to respond promptly and flexibly online or offline to various and often fast-moving and interacting challenges and tasks. Think of this readiness as a low-key activation of high-level executive abilities (more like the diffuse awareness when just waking up or, in mechanical terms, like a car engine in neutral), which are apt to go into high gear and focused targeting as soon as specific tasks demand. In other words, self-consciousness is this dispositional readiness, always on, when awake, to allocate the right executive resources to handle the task-directed mental states in the right patterns with the right intensity. The phenomenal expression of self-consciousness reflects the physiological or biochemical constitution of mental states handled by the right concertation of high-level executive abilities.

This concludes the summary of my account of the executive design of self-consciousness and its unique sociocultural and sociopolitical grounds in human ontogeny. In the remaining two sections I propose first an executive reinterpretation of some core insights of other accounts of consciousness and then another look at the puzzle of conscious phenomenality.

13. CONSILIENCE WITH DISSENT

No philosophical discussion of consciousness (or anything else) is taken seriously without some critical reference to other views. (Blame Socrates for that.) I prefer to be narrowly constructive instead and take a revisionist take on a few other views of consciousness. My comments will be brief, unexegetical and unreferenced.

As I read them, some functionalist theories of self-consciousness are either mostly executive or can be plausibly reinterpreted in such terms. The 'global workspace' theory emphasizes working memory and multimodal and multi-faculty broadcast of information -- all high-level executive abilities in the wider panoply that generates self-consciousness. The 'multiple drafts' theory can be read as insisting on a constantly active projection engine that generates competing anticipations and predictions on the global workspace. Both theories, so reinterpreted, tell only part of the executive story of self-consciousness but are compatible with the rest of the story told earlier.

Several representational theories frame consciousness very narrowly by taking distinct and isolated mental states to be the locus of consciousness. I think this notion of self-contained mental-state consciousness is problematic. At any time, self-consciousness operates a multimodal, multi-state and multi-representational manifold. Instead of locus, I take the narrow framing of these theories to capture the <u>focus</u> of self-consciousness, and that is an executive framing.

Thus, higher-order representation theories (HOR), encompassing higher-order experience (HOE) and higher-order thought (HOT) theories, can be reinterpreted as positing a focused targeting of specific mental states by such executive mechanisms as top-down attention, monitoring and metacognition. The work of such mechanisms does not <u>make</u> a mental state

conscious but rather bring it within the manifold of self-consciousness, with special treatment or attention, as it were. This executive reinterpretation preserves the manifold framing of self-consciousness while explaining why and how a particular mental state may become conscious at all or conscious to an enhanced degree. At the same time, this executive reinterpretation need not posit the mindreading capability of intuitive psychology as required for higher-order focus (HOF), thus allowing those lacking this capability or barely having it, such as human infants and other sociopolitical mammalians, to be members of the (extrovert) "consciousness club." An executive HOF account seems more plausible than a HOR one for specific mental states becoming conscious but neither a HOF nor a HOR version seems plausible as an account of self-consciousness in general.

14. THE LIGHTNESS OF CONSCIOUS PHENOMENALITY

What follows may catch the attention of consciousness experts more -- and irritate some of them more -- than the stuff of earlier sections. It shouldn't. It is an afterthought and brainstormer rather than a substantive analysis. Section 11 divorced phenomenality from self-consciousness. With an eye to the history of their rocky relationship, this section remarries them but finds the status of the phenomenal partner much diminished as a result.

As is obvious by now, my account of self-consciousness has not addressed such burning questions as 'how does physical matter or more narrowly the brain produce phenomenal consciousness?' or 'can empirical science ever explain phenomenal consciousness reductively and, with it, the subjective, what-it-is-like character of conscious experience?' or 'are we mentally equipped to understand phenomenal consciousness?' or other questions that stress the puzzle or mystery of the phenomenality variable in the consciousness equation. These burning questions have recently defined a new philosophical paradigm in which to think of consciousness. I call it the phenomenalist paradigm of consciousness or PPC, for short.

If you ask me, the really hard question concerns the functional design of self-consciousness, not its phenomenal top, so to speak. The burning questions are asked from the phenomenal top, in its terms and according to

its intuitions, from its inside-view perspective. This perspective and the entire PPC are relatively new historically, as far as I can tell. Reflecting on this novelty and trying to understand it may help rethinking the phenomenal aspect of consciousness.

Even though nobody could miss the phenomenality of consciousness, the burning questions and the PPC itself were never seriously or systematically considered by philosophers before Descartes. Even the clever Frenchman seemed rather uninterested in conscious phenomenality as such (his inner eye usually scanning meditatively cold thoughts and attitudes) and focused instead on the epistemological role of (mostly cold) consciousness and its metaphysical import as substance, not as qualia. To exaggerate and simplify, phenomenal consciousness has only recently (make it soon after WWII) become the insoluble puzzle or unfathomable mystery at the center of the new PPC and fueling a huge and popular philosophical industry. Why?

I think the collusion of three historical trends is largely responsible for this development. The first is the conceivability game, played brilliantly by Descartes lui-même in the mental field, as a deductive bridge from mental fancy to metaphysical possibility. The second trend, which brings in conscious phenomenality, looks like a cocktail of faint traces of turn of 20th century phenomenology and sense-data epistemology (the unbreakable certainty of a quale such as 'appearing-to-redly' and that sort of quaint stuff) mixed with the more potent brew of commonsense intuitions and concepts shaped by inner, introspective experience -- the view from inside, that is. On the other side of the fence, the third trend was the aggressive physicalism posited by the logical positivism of early 20th century as an optimistic distillation of an all-explaining and reductive natural science.

When the first two trends collide with the third, we more or less have the big bang of the puzzle of phenomenal consciousness. (For the cognoscenti, the irresistible stories of 'zombies' and 'what Mary didn't know' are prominent examples of these trends smashing into each other.)

To see how this collusion of trends has shaped the recent consciousness agenda, I will bring in mysterianism, best articulated by Colin McGinn (1991) and anticipated by Thomas Nagel (1974). Mysterianism about consciousness starts from the notion that we are not mentally equipped to understand everything (a reasonable premise), and goes on to argue that, as

intuited from inside, conscious phenomenality and in particular the nonspatiality of its contents are beyond the reductive reach of science. This explanatory impotence results from the fact that science cannot explain what is not spatial and hence what is intuited from inside in the very terms of those intuitions. Descartes went almost as far as that but PPC takes a dramatic step further and places qualia-like phenomenality in the center of inside intuitions about consciousness. This step, more than anything else, shapes the puzzle of conscious phenomenality. Let me elaborate.

Conscious phenomenality did not loom large and puzzling in philosophy until recently because conscious experience, as viewed from inside in qualitative terms, was not deemed to be the right conceptual framework in which to ask and answer important questions about the mind. Yes, privately experienced mental events were a trigger for systematic philosophical speculation and often (as in modern empiricism) the raw material for the first intuitions about the mind or about the unassailable atoms of certainty (as in foundational epistemology) but -- BUT -- the terms, the concepts, the perspective, the framework in which systematically to think of and explain such mental matters were theoretical, general, even abstract, not private and intuitive. The nature of the explanandum, in other words, was defined by the theoretical or systematic framework of philosophical analysis, not by the inner qualitative experience and in its terms, which is how PPC defines it. The PPC redefinition is a dramatic historical shift in philosophy of mind.

Yet, I hear you objecting, the phenomenal side of consciousness, as experienced qualitatively from inside, is mentally real; it is not an invention, a fancy of the mind. Yes, conscious phenomenality is real but the question is how do we want to understand (conceptualize, explain) it? It is a question of intellectual decision (I could not say 'scientific' without begging the question). The history of philosophy shows different such decisions at work for different reasons, under different intellectual constraints and methodological options.

To probe further, even the reality of conscious phenomenality and its properties can be a matter of systematic inquiry, not just inside intuition. My analysis of self-consciousness suggests that without a high-level executive machinery operating in certain ways phenomenality (as a way of registering, categorizing and reacting to inputs) is unconscious and subpersonal, like in

blindsight; it is sentience, as noted in section 11. With executive machinery, phenomenality becomes conscious and personal, affording a subjective point of view, but these mental novelties have executive, not phenomenal springs. Just like self-consciousness and alongside it, subjectivity and point of view diminish, as the high-level executive powers diminish or are damaged, and vanish altogether when mere sentience takes over.

If conscious phenomenality reflects the conjunction of an executive machinery and the underlying sentience of a nervous system, both complex and rich mentally, how much independent reality does conscious phenomenality have by itself? Differently said, how much it contributes to what a mind does that was not already produced by the other two major components? Relatively little, I would venture. It has a rather thin sort of reality, a "lightness of mental being," so to speak. There is not much to explain there (there is little 'mental there' there!) in a robust sense of explanation that both science and classical philosophy assume. This is partly why the latter do not have a grip on the phenomenon.

Here is an analogy to help thinking about the thin mental reality of conscious phenomenality. Consider indexicals like 'I' and 'here.' Everybody understands them and uses them correctly but there is no easy or plausible way to redescribe them in more general terms and thus link them to, and embed them in, other, richer parts of the world or mind. Any richer redescription necessarily loses (or doesn't follow from) their strict indexicality. End of story. This is probably why there are no stolid and lengthy treatises about the literal I or HERE. (Self and Umwelt are another matter: rich, descriptive, speculative -- serious business resulting in fat books). This may be the main reason why the thin conscious phenomenality did not attract the attention of classical philosophy: it may have been regarded as a mental indexical of sorts -- you have it all right, just like you are always an I here, but what's the big deal?

On further thought, conscious phenomenality may actually function like an intramental indexical: it signals from inside that the required executive machinery is on and its intramental matrix has reached the complexity and integration or binding that turns unconscious sentience into something [like-that], where 'that' is what we all experience consciously but so privately -- just like, by being alive and kicking in some portion of space, we are all I's

here and hence able publicly to use those words. Just as the 'I' and the 'here' do not provide much room for explanation in the very terms of their intuitive content, the same is true of conscious phenomenality, if limited to its intuitive contents, as the PPC story requires. End of story? Almost but not quite.

Psycholinguistics can explain the function of indexicals such as 'I' and 'here' and their uses as well as their developmental emergence in children's vocabulary, when the right mental resources are in place, without having to do so in the thin terms of their intuitive contents. Likewise, cognitive science may aim to explain the function of conscious phenomenality and some of its properties, even puzzling ones, without having to do so in the equally thin terms of its inner experience.

Echoing Dan Dennett's heterophenomenology (1991), cognitive science can turn some of the weird properties of conscious phenomenality into pretexts for and clues to systematic explanation. This maneuver would not probe the thin reality of conscious phenomenality as such but may peel off a bit or more of its alleged scientific mystery.

For example, how about the nonspatiality of consciously experienced contents, that potent source of dualism and mysterianism? No problem (with enough time-off and funding)! Start with transparency. The well-known fact that mentation is transparent and focused on content, not on its brain, functional or representational carriers, explains why the spatiality of any of the latter is inaccessible by virtue of mental design. Why mental design ensures such transparency could in turn be explained in functional and perhaps even evolutionary terms. On the other hand, revealingly, when a consciously experienced content is explicitly represented in order to be mentally manipulated, its phenomenality has detectible spatiality and/or temporality, borrowed from the sound or visual shape of language or sequencing of inner speech or layout of the visual field or mental imagery. And so on, for experienced time, perception of phantom limbs, semi-consciousness of dreams, and other puzzling and normal properties of conscious phenomenal experience.

Whether our understanding of conscious phenomenality is at an irreducible impasse or is work in progress depends on how we want to approach and understand it, from what intellectual perspective. History of

philosophy has some lessons for us on this matter. But the lead story of self-consciousness, as told here, is a different matter, whatever happens to our philosophical sense of conscious phenomenality.

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