

**NO-THING IN COMMON BETWEEN THE UNCONSCIOUS AND THE BRAIN:
ON THE (IM)POSSIBILITY OF LACANIAN NEUROPSYCHOANALYSIS**

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ABSTRACT. Lacanian psychoanalysis, with its emphasis on the unconscious as the insubstantial gap in experience, largely remains opposed to the neuropsychanalytic project. This is particularly evident in the title of the PIPOL9 congress: "The Unconscious and the Brain: Nothing in Common." Any interface with neuroscience is feared as an abandonment of the unconscious and a secession to a neuroscientific meta-language. I argue that this position conflates neuroscientific *discourse* with neuroscience *per se*. Situating a wall between psychoanalysis and neuroscience not only risks the unchecked proliferation of the idealizations of neuroscientific discourse; it also shelters psychoanalysis from considering the issues of neuroscience and material reality. Rather than rejecting any relationship between neuroscience and psychoanalysis, I assert that the genuine Lacanian position is instead: 'The unconscious and the brain: *No-thing* in common.' The radical gap (the *no-thing*) of the real should not be considered the impossibility of a dialogue between psychoanalysis and neuroscience. Rather, the real must be situated as an impossibility internal to both psychoanalysis and neuroscience. Paradoxically, this *no-thing* is a prerequisite for a genuine discourse between the two disciplines. From this basis, a Lacanian neuropsychanalysis can emerge.

Keywords: neuropsychanalysis, neuroscience, real, affective consciousness, free energy principle, PIPOL9

1. AN INTRODUCTION TO THE QUESTION OF A LACANIAN NEUROPSYCHOANALYSIS

It is an amusing coincidence that the twentieth neuropsychanalysis congress (with explicit calls for Lacanian thought on sex and drive) was held in Brussels only a few days after the PIPOL9 congress in the same city. As the title, “The Unconscious and the Brain: Nothing in Common,” suggests, PIPOL9 argued against neuroscience and warned against the hegemonic dominance of a neural ‘meta-language’ which ignores the primacy of the unconscious. This draws on the larger issue of the relationship between psychoanalysis and neuroscience. Some psychoanalytic schools recognize some degree of ‘substantialization’ (e.g., recognition of specific drives such as attachment, play, etc.) and may be more open to the findings of neuroscience which can taxonomize the drives with greater precision. However, the Lacanian emphasis on the ‘insubstantial’ subject of the unconscious as the formal, destabilizing gap in experience might seem radically incompatible with the brain (Redmond, 2015).

Distilling the issue to its most basic, Yves Vanderveken, the director of PIPOL9, states: “*the brain does not know the drive* – in the sense that the drive is what makes a hole in cognition” (Vanderveken, 2018, emphasis in the original). I will take the PIPOL9 argument as the starting point for an immanent critique of this rejection of neuroscience. I have briefly discussed the issue of a ‘Lacanian neuropsychanalysis’ elsewhere (Dall’Aglio, 2019a). Here, I will develop this point more fully via a critique of the PIPOL9 argument¹. I will specifically draw upon the philosophical work by Adrian Johnston and the Anglo-American neuropsychanalytic meta-psychology of Mark Solms to illustrate the possibility of a Lacanian neuropsychanalysis.

Through ‘reverse-engineering’ arguments against neuroscience (which will be discussed below) by Vanderveken (2018) and Redmond (2015), the following criteria seem necessary for a Lacanian neuropsychanalysis. (1) *Neither bio-reductionism nor psychologism*. Lacan rejects a reduction of the subject of psychoanalysis to either biological or psychological explanatory determination. Instead, he proposes a formalization of the subject (Redmond, 2015). This also implies a radical opening beyond the laws of physiology to the law of contingency. (2) *Recognition of a structural limit or impasse*. The formalizations proposed in Lacanian psychoanalysis avoid the ‘closing-up’ of the unconscious by emphasizing the radically non-cognizable real at the extimate core of the subject (Vanderveken, 2018).

Over the course of this paper, I will show how the brain meets these criteria, namely that *the brain, with its own structural impasse, is irreducible to biology*. There is, however, the additional question of *why* Lacanian psychoanalysis should engage with neuroscience—what is to be gained? I suggest that Lacanian theory stands to benefit from such a dialogue in two areas: (1) a new space for possible conceptual connections and exploration; (2) better capacity to engage in mental health discourse. But first, I will address the PIPOL9 criticisms of neuropsychanalysis.

¹One should be aware that I am specifically critiquing the PIPOL9 *argument* by Vanderveken (2018) and posts on the PIPOL9 site which support the argument, rather than congress as a whole (which was, to my knowledge, more nuanced and open than one might expect based on the argument).

2. THE PIPOL9 ARGUMENT: THE UNCONSCIOUS AND THE BRAIN HAVE NOTHING IN COMMON

At the outset, I point out that the PIPOL9 argument warns against a very real threat to psychoanalysis. Vanderveken (2018) highlights the dominance of the prefix ‘neuro-’ in the contemporary world. Many disciplines have opened their doors to neuroscience as a common unifying point to improve their efficiency. Underlying this trend, the danger of ‘cognitive materialism’ threatens to reduce multiple fields (e.g., neuro-economics, neuro-education, neuro-management, etc.) to brute quantification. The signifier ‘neuro’ stands for this reduction of the psychical to what is quantifiable. Mental processes are reduced to observations in blood-flow to brain areas (i.e., functional magnetic resonance imaging, or fMRI). Neurosis is reduced to explanation by ‘aberrant brain functions.’ One is tempted to claim: ‘There’s nothing wrong with me; there’s something wrong with my brain!’ This forecloses the impossibility of the subject, and the brain becomes a bastion of knowledge – a site where pathology can be removed and the individual shifted to the happy average point on the normal distribution curve. While the neurosciences have not provided certain answers yet, the promise remains just as convincing.

One might frame the danger of this neuro-cognitive paradigm as a propping up of the imaginary. It stands in a space of (the promise of) total knowledge and unification, with the rejection of any structural impossibility. One finding is a particularly striking revelation of the predominance of this imaginary mode. McCabe and Castel (2008) found that just having images of brains in research articles increased ratings of scientific reasoning compared to articles without brain images. This testifies to the lure of the imaginary in contemporary neuroscience research. Indeed, the (image of) the brain “veils the real of *jouissance*” (Vanderveken, 2018). Excess and imperfection are taken to be things which can (and should) be removed. The neuro-cognitive paradigm knows no limit, its ‘total solution’ ignoring the excesses of *jouissance* and the function of human desire. Thus, Vanderveken (2018) states: an “*ethics of desire is opposed to this civilization of the cipher and of cerebral imagery.*”

The reference to ethics invokes Lacan’s (1992) reading of the superego (Copjec, 2004), which allows one to further articulate the dangers of this neuroscientific discourse. Rather than a reasonable conscience, recall that the superego is a cruel agency which incessantly demands more and punishes relentlessly, even more so if the ego does as it is told. This is the superego’s paradoxical logic of guilt: the more the ego submits, the greater the guilt. The superego offers the false promise of an attainable ideal for the ego, yet it is impossible to reach this ideal. Therefore, the punishment in store for the ego is limitless. This sadistic underside points to the real dimension of the superego (Žižek, 2006). For this reason, Lacan rejects an ethics modelled on social conscience of some ideal.

One might frame Vanderveken’s criticism of the neuro-cognitive paradigm in a similar fashion. In setting up an imaginary ideal in neuroscientific research (i.e., total knowledge is possible through neuroscientific study) and clinical implementation (i.e., supporting statistical averages for ‘normal’ brain activity, neurotransmitter levels, etc.), the dark underbelly of violent normalization and endless monetary investment can emerge. The denial of impossibility (by submitting to the ideal) allows the sadistic real of the superego to sneak in. This is why Vanderveken raises the stakes to an “ethical hypothesis of the unconscious.” The ethical imperative of recognizing the unconscious is to reject the trap of neuro-cognitivism.

3. NEUROSCIENTIFIC DISCOURSE VERSUS NEUROSCIENCE

Vanderveken takes a similar position as Éric Laurent (2014) who critiques ‘cognitive psychoanalysis’ in the domain of neuro-plasticity. Neuro-plasticity refers to the brain’s capacity to dynamically change its connections based on interoceptive and exteroceptive experiences, a process also called ‘reconsolidation.’ Vanderveken warns that neuro-plasticity opens the doors to biopolitically enforced homogeneity and ‘correction’ of those whose problems are rooted in their brains’ ‘erroneous wiring.’ At a more fundamental level, Vanderveken maintains that the unconscious is “not the trace left by experience, which would testify to neuroplasticity... the unconscious that we encounter through psychoanalysis bears witness to a real that is peculiar to it.” Vanderveken’s criticism of neuro-plasticity is based on its denial of the real, a denial which opens the door to cruel impositions of societal hegemony (cf. the logic of the superego).

While Laurent (2014) shares Vanderveken’s rejection of a reading of neuroplasticity which ignores the real, Laurent points to the work of Ansermet and Magistretti (2007) which allows a more Lacanian reading of neuro-plasticity. While experience indeed leaves a neural trace, Ansermet and Magistretti assert that this trace is not faithful to experience. They read the trace like the Lacanian signifier, independent from any specific signified. Any experience leaves a trace, but these traces continue to change based on additional experiences (both external and internal) which divorce the traces from the original encounter. In other words, there is a gap between trace (signifier) and experience (signified). This draws on Malabou’s (2012) notion of ‘destructive plasticity,’ where neural traces can be effaced—a gap is opened which has observable effects on the psyche. Instead of the typical, adaptive reading of reconsolidation, Ansermet and Magistretti open a space for ‘deconsolidation,’ a break-down in associations which opens a gap in the causal chain. While Laurent (2014) does not necessarily endorse this position as adequate for a Lacanian neuropsychology, the work of Ansermet and Magistretti raises a crucial point: the possibility for impossibility (i.e., the gap, the real) to be considered *within* the neurosciences. It is curious why PIPOL9 attacks the application of the neurosciences to mental life without highlighting Lacanian approaches such as Malabou (2012), Johnston (2013), or Ansermet and Magistretti (2007) which seek to avoid disavowing the real.

Additionally, while neuro-imaging is indeed a predominant research method in the neurosciences, PIPOL9’s focus on imaging as paradigmatic of neuroscience (see Vanderveken, 2019) misses other key research methods which are not limited to brain scanning. In fact, within the fields of psychology and neuroscience, relying exclusively on brain imaging data is considered poor research quality for various inferential reasons (Krakauer, Ghazanfar, Gomez-Marin, Maclver, & Poeppel, 2017). Surprisingly, the PIPOL9 argument does not address the clinico-anatomical localization method of Kaplan-Solms and Solms (2002), which is perhaps the *foundational method* for neuropsychology. In this method, patients with focal brain lesions engage in psychodynamic psychotherapy. One can then correlate² dynamic changes in the mental apparatus (based on the psychotherapy experience) with brain locations. Catherine Morin’s (2018) excellent neurological case studies from a Lacanian perspective are wonderful examples of such neuropsychological research which does not submit to the totalizing promise of brain imaging by attending to the unconscious as revealed through speech.

²Albeit, not correlation in a simple, one-to-one fashion. Kaplan-Solms and Solms champion the logic of ‘dynamic localization’ in their clinico-anatomical method. For a discussion of dynamic localization in relation to Lacanian meta-neuropsychology, see Dall’Aglio (2019a).

It seems that the primary target of PIPOL9, rather than neuroscience *per se*, is the predominant (often cognitive) *neuroscientific discourse*, the public discourse around neuroscience and its clunky application to other fields. With respect to neuroscientific discourse, I agree wholeheartedly with Vanderveken. Neuroscience often operates as a meta-language which will supposedly enrich all disciplines through an omniscient master's discourse because it 'knows' how the brain works. Rowan (2019) nicely articulates the various negative effects of the neuro-discursive situating the brain as cause (and therefore site for uncovering knowledge). One observes the structure of Lacan's capitalist discourse here, where the internal division of the subject is denied and the object which can offer wholeness is offered (Vanheule, 2016), usually in the form of a pill-cocktail with a costly price tag.

However, it is important to distinguish between neuroscientific discourse and neuroscientific study of the brain. Indeed, good scientists recognize the many open questions concerning neuroscientific knowledge, and their personal sentiments concerning the clinical relevance of neuroscientific studies is not nearly as optimistic as what is often written in the scientific journals. Moreover, scientists also recognize that the natural sciences are encountering several 'limits' in their investigations of causal knowledge (Aguiar, 2018). The corrupting aspects of neuro-cognitive discourse have very real negative psychological effects and should be criticized. But, it would be excessive to also dismiss the neuroscience behind the discourse, particularly its potential relationship to psychoanalysis. The PIPOL9 argument seems to conflate neuroscience with neuroscientific discourse, where both are considered totalizing imaginary traps by mapping the brain (e.g., Bassols, 2019).

Consider Vanderveken's recognition:

That there are interventions on the brain that can change behaviors, modify them, is not to be doubted. This is precisely what does not cease to concern. No one denies the progress allowed by science in the medical field in general, and in the field of the brain in particular. A leap is at work, however, once we enter the field of subjectivity and the mind [mental]. Psychoanalysis will be able to reap its effects, insofar as psychoanalysis is the place of address and interpretation of that which constitutes the absolute fault that inhabits the speaking being. (Vanderveken, 2018)

There are traces of disavowal here. Vanderveken recognizes the impact of the brain upon behavior but immediately dismisses any implications this might have for the mental. In other words, it assumes that the space of psychoanalysis – the “field of subjectivity” – is *independent* from that of neuroscience, that these are two distinct domains which have “nothing in common.” Vanderveken situates a limit between the biological and the psychical, for there is a “leap” when entering the mental—only psychoanalysis can reign here. This is because, as Vanderveken puts it,

As psychoanalysts, we have the experience that the encounter with jouissance and the manifestations of desire – even if these may produce dopamine! – is related to an absolute contingency. Jouissance and desire are always singular, they do not respond to any model, they are subjected only to the law of pure encounter. In the field of the relation between the sexes in the speaking being, nothing pertains to an established program – only invention reigns here. This is what Lacan indicated with the aphorism:

There is no sexual relation. That is the ground for our compass as psychoanalysts. There is what we call a disturbed *jouissance*, intrinsically dysfunctional, of the speaking being with his or her own body. It blocks the relation between the sexes and any possibility of hedonistic reconciliation. This fault is opposed to any physical determinism, program or calculable real. It concerns a real that remains at the mercy of absolute contingency. (Verderveken, 2018, emphases in the original)

This position is tenable if the opponent is the neuroscientific discourse, which does promise a “calculable real.” However, if the opponent is the study of the brain itself, then the situation is more complicated. To return to the logic of the superego, recall the two sides: the promise of an ideal, and an ego capable of attaining it. Here are two wholes which can supposedly meet. On both sides, impossibility is disavowed, which is one reason Lacan rejects this position in his search for an ‘ethics of the real’ (Copjec, 2004; Lacan, 1992).

Lacan (2000) makes a similar move when he speaks of the sexual non-relation. ‘There is no sexual relationship,’ but not because man and woman are totally distinct entities (i.e., wholes) which cannot understand each other. This would be analogous to ‘men are from Mars, and women are from Venus.’ The case is more radical—the difference (impossibility) between the sexes is *within* each position in the formulas of sexuation (Copjec, 2015). On either the masculine or feminine side of the formulas, there is an internal logical paradox³. This is what makes sexual relations exempt from any “physical determinism” and subject to the “mercy of absolute contingency.”

I propose that an analogous logic should be employed for understanding the relationship between neuroscience and psychoanalysis. If psychoanalysis operates on the side of the mental and takes impossibility (cf. “dysfunctional *jouissance*”) as its “compass,” then one must also situate an impossibility on the side of the brain in the domain of neuroscience. In other words, rather than posing the mental as the external limit to neuroscience, one should situate the field of the mind as rooted in an *internal* limit or impossibility within the brain.

It is therefore a question of the relation between the real of neuroscience and the real of psychoanalysis, where both fields are recognized with an internal split, an estimate causal gap. It is true that the real of psychoanalysis is “opposed to any physical determinism.” However, this does not mean that one should dismiss the physical in its entirety. This would ‘throw the baby out with the bathwater.’ Rather, in a Žižekian (2019) fashion, one should do the opposite: ‘throw out the baby and keep the bathwater.’ Throw out the nice, clean neuroscientific discourse with its promises of ideals, and instead take seriously the dirty bathwater of neuroscience, the rigorous research which creates more questions than it answers and runs up against certain limits. Aguiar (2018) nicely summarizes various lines of neuroscientific research to show how the real of neuroscience is increasingly indeterminate and open to contingency, a ‘real without law.’ I propose that this view of the brain – as structured with an internal impasse which opens it up to contingency – is necessary for a Lacanian neuropsychanalysis.

³Žižek (2004) generalizes this formal move in *The Parallax View*. Where there is some irreducible antagonism between two concepts, that antagonism is (re)situated within the concepts.

4. THE BODY AND THE BRAIN IN PSYCHOANALYSIS: *IL N'Y A PAS DE RAPPORT INTRACÉRÉBRAL*

One should reject the fully determined, mechanical view of body and the brain. This is a brain without *jouissance*. Yet, the Lacanian understanding of the body as a site of sex does not call for a rejection of the body of the life sciences. It necessitates a *rethinking* of this body, a body which contains its own aberration from the formal laws of physiology (Copjec, 2004).

Adrian Johnston's work demonstrates precisely this sort of rethinking with respect to the brain. After highlighting the etymological relationship between 'organic' and 'organization,' Johnston (2012) proposes the concept of the 'anorganic.' Whereas the traditional organic body of the life sciences is the site of a knowable organization, Johnston highlights the 'more than nature' within nature itself. As opposed to inorganic, which denotes inorganic life, anorganic refers to the negation of the organic (i.e., non-organized, beyond the organic) *within* the organic itself. It is the internal impasse within the 'natural' law which opens a space for something *unnatural* to emerge. Nature is not preprogrammed with a teleological endpoint—it is 'rotten' from the start, full of impasses which make contingency necessary. Johnston's materialism does not divorce the psychical from the physical, nor does it reduce the mental to the biological. Rather, there is an inherent rift *within* the biological which makes the biological more than bio-logical.

Johnston (2013) finds these anorganic roots within psychoanalytic views of the body, with concepts such as Freud's infantile helplessness and Lacan's early discussions on the mirror stage and ego⁴. While the early Lacan had not yet fully developed the concept of the real which Vanderveken makes essential, Lacan still had a view of biology as something premature and radically incomplete. Indeed, it is the *body-in-pieces*, fragmented by the partial drives, which seeks totalization in the imaginary, a totalization which structurally fails. Rather than situating impossibility *between* neuroscience and psychoanalysis, a more radical dialogue between the two would recognize the impossibility *within* each field. This may be their very point of (non)relation.

Johnston's materialism allows one to challenge the criticisms that neuropsychology 'grounds' psychoanalysis in the brain (Redmond, 2015). Highlighting Lacan's emphasis on formalization, Redmond attacks certain experimental paradigms which supposedly operationalize the unconscious (e.g., the study of primary process cognition). Like Vanderveken, he keeps the psychoanalytic field of the unconscious outside of biology and statistical quantification—the subject is precisely what falls out of this quantification.

While the subject exists outside the empirical, cognizable space of reason, one should recall that the Lacanian subject is not simply separate from reason. Emphasizing that the subject is what slips out from neuroscientific quantification *does not* mean that the subject is totally unrelated to the brain. The real is not some impossibility situated at an external limit (e.g., the subject as the external limit of neuroscience where only psychoanalysis can operate). There is no outside of reason; there is no meta-language. The real is an internal limit, an internal impossibility (Copjec, 2004). On the essential role of gaps in neuro-plasticity, Ansermet and Magistretti (2007) make a similar argument: the organism appears 'genetically determined to not be genetically determined.' The anorganic slipping out of the subject must be situated within the brain itself.

⁴To this, I would add Lacan's (2000) characterization of the body as the site of *jouissance*.

In opposition to biology, Redmond (2015) highlights Lacan's (topo)logical formalizations which avoid 'grounding' psychoanalysis in any materialism. One should pause, however, to ponder the essence of Lacan's formalizations. For Lacan, due to the internal situating of the real, formalization is only possible by formalization which contains its own impasse (cf. the formulas of sexuation, Copjec, 2015; Zupančič, 2017). What if neuropsychanalytic research can come to similar formalizations? One might – as Johnston (2013) does – make a parallel formalization for neuroscience: “There is no intracerebral relationship.”

Johnston (2013) proposes that the brain itself should be understood as divided by recognizing a neural non-relation. He emphasizes the split between non-representational, subcortical affective structures (i.e., brain structures concerned with affect which are fundamentally without representation, language, or imagery, but which still produce the pressure of feeling) and neocortical declarative structures (i.e., structures responsible for language, representation, reflective cognition, etc.). Drawing on Linden's (2008) view of the brain as a 'kludge,' a hodgepodge of disparate systems which are evolutionarily out of sync and not preprogrammed in a harmonious relationship, Johnston claims that the brain is structured with a fundamental, anorganic discord. Johnston proposes that the uniquely human subject emerges only because of the structural impossibility of a harmonious relationship within the brain. One may go a step further. The formalization 'there is no intracerebral relationship' has as its corollary that there can be no judgment of the brain based on a norm. There is no *formula* for perfect neural harmony. Each subject must create his/her own singular solution to impossibility. One is now in the space of contingent invention.

Such a stance avoids the PIPOL9 critique that neuroscience promises a teleological, harmonious norm for the brain to aim towards. While this might be the claim of neuroscientific discourse, this is not necessarily the claim of the neurosciences *per se*. Moreover, Johnston's position shows that a proper neuropsychanalysis does not reduce psychoanalysis to neurobiological explanation. By recognizing the internal limit of neurobiology (there is no intracerebral relationship), psychoanalysis cannot be completely grounded in neurobiology, in contrast to Redmond's (2015) critique. Deterministic physiology runs up against a limit, and the intracerebral impasse denotes a point of radical opening to contingency within the brain itself. Thus, the brain does not cause mind, but this does not do away with the brain.

Although not a Lacanian, Mark Solms shares this fundamental anti-reductionist stance. For example, his recent work on the hard problem of consciousness with Karl Friston (see below) comes from the sentiment that one should seek the formal laws which govern both the brain and the mind. This work builds upon his *dual-aspect monism* as the philosophical position for neuropsychanalysis (Solms, 2015b). Simply put, the brain does not cause the mind, and the mind does not cause the brain. Both are incomplete perspectives of the same 'thing' in nature, the 'mental apparatus'⁵. When viewed objectively (i.e., as an object of the classical sense modalities), this mental apparatus is studied as the brain. When viewed subjectively, this mental apparatus is studied as the mind. Neither viewpoint gives a totalizing understanding, but the consideration of both perspectives paints a more thorough picture. Although a Lacanian would emphasize the ontological gap within

⁵This dual-aspect monist stance differs from the neuroscientific stance criticized by PIPOL9 (e.g., Neus, 2018; Unterberger, 2019). The statement that 'we are our brain' does not lead to the conclusion that brain *causes* mind. See Solms (2015b) for neuropsychanalytic case studies which illustrate this point.

this ‘thing’ in nature, this does not invalidate the position that there can be two views of this thing, both of which are rift by an inner antagonism.

From this lens, one might criticize Vanderveken (2019), who claims that “it is not the brain that thinks what we call the subject. The subject is precisely that part which escapes its representation.” Instead, one might say that (some aspect of) the brain also escapes representation. Solms’ co-relation between brain and mind cannot be rejected by defining the subject as that which falls out of the brain (cf. Redmond, 2015). As noted above, this escape should not be situated as an external limit, but rather as an internal impasse. This requires a rethinking of neuroscience, not a rejection of it.

One might respond in a similar tone to Unterberger (2019), who argues that the brain is not the mind. She reminds us that the unconscious is a sediment of language, whereas the brain “has a material support, a configuration, differentiated zones and regions, specific centers, functions, and mechanic articulations perfectly recognized, locatable, etc.” This is a rather simplified view of the brain, which is not shared by serious thinkers in neuroscience. The supposedly ‘specific centers’ and ‘perfectly recognized’ localities of the brain are neither specific nor perfectly recognizable in relation to mental processes (cf. dynamic localization; Kaplan-Solms & Solms, 2002). For example, Ellis and Solms (2018) argue that the cognitive capabilities of the brain are not innate and are highly experience-dependent; neuro-plasticity is non-determinate insofar as connections may continuously form and deform (Ansermet & Magistretti, 2007). Moreover, similar focal brain lesions can produce considerably different psychological profiles in neurological patients, profiles whose emotional dynamics are intricately linked to the subject’s personal history (Solms, 2015b). The brain is anything but a perfectly organized system.

5. THE CASE OF CONSCIOUSNESS: AFFECT AND THE FREE ENERGY PRINCIPLE

Solms’ work will be considered from this Lacanian neuropsychanalytic perspective in order to illustrate one way in which the philosophical basis offered by Johnston can be applied to current work in neuropsychanalysis in such a way that avoids the criticisms of bio-reductionism by PIPOL9. A more extensive discussion of these details can be found in Solms and Friston (2018). I will briefly describe the essential points in order to illustrate a Lacanian reading of this neuropsychanalytic work.

Solms and Friston (2018) aim to discern the abstract (i.e., mathematical) formalizations concerning the ‘hard problem of consciousness’: How does the brain generate consciousness? As one might expect from above, Solms (2019) rejects the question at the outset. The brain does not cause or generate the mind—they are two perspectives of the same thing. Rather, one should focus on the formal laws which explain consciousness from both the mental (subjective) and the neural (objective) perspectives.

5.1. The conscious id. Based on his integration of several lines of neuroscientific research, Solms (2013) has argued that consciousness is, in its most rudimentary form, affective. That is, it is not representational, reflective, cognitive, or declarative – such forms of consciousness are modulations of a more rudimentary affective being which experiences the pressure of feelings. Feelings signal unmet needs, either in the body or emotional needs intrinsic to the brain itself (Panksepp, 1998). This “affective consciousness” is generated in evolutionarily ancient structures which reside deep within the brain (i.e., the limbic system and brainstem), most notably the extended reticulo-thalamic activating system (ERTAS). Solms highlights the seven emotional instincts identified by

Panksepp (1998): SEEKING, PLAY, CARE, FEAR, RAGE, LUST, and PANIC⁶. These systems contain their own needs (e.g., attachment needs in the PANIC system) and their own stereotyped behavioral responses. However, these responses are only ‘rough-and-ready.’ There are ‘holes’ within these systems which open a space for contingent learning and neuro-plasticity—they are not fixed. Moreover, these instincts of affective consciousness are fundamentally non-representational, unlike the representational, declarative structures of the evolutionarily recent neocortex which involve mental representations of experiences through images, language, and thought.

Solms emphasizes that the structures responsible for affective consciousness are *necessary* for all forms of consciousness. For example, hydranencephalic patients (who are born with no cortex but intact subcortical systems) lack representational consciousness but retain affective being. They respond to the environment and have clear displays of feelings (Merker, 2007). On the other hand, disruption of deep brain regions necessary for affective consciousness *wipes out* consciousness (Moruzzi & Magoun, 1949; Penfield & Jasper, 1954). Solms thereby asserts that affective consciousness is the bedrock of consciousness. Any attempt to infer formal principles of the mind must start at the level of affect.

5.2. The free energy principle. In Friston’s (2010) free energy principle, the brain is not a passive recipient of sensory inputs. Rather, the brain functions like a Bayesian inference machine, actively generating predictions about its experiences. Specifically, predictions (also called inferences or beliefs) explain prediction errors. Prediction error (a measure of free energy) is a quantification of uncertainty, a measure of entropy in a system. It is also termed surprise. A prediction is a probabilistic inference of the cause of a given prediction error. Sensory inputs from the body (interoception) and external world (exteroception) are experienced as prediction errors. The brain strives to optimize evidence for its predictive model via two broad mechanisms: action (selecting inputs which support the model) and perception (updating internal predictions to better explain input).

Although the terms ‘prediction,’ ‘belief,’ and ‘surprise’ may be psychologically misleading, these signifiers nevertheless help illustrate the relationship between predictions and prediction errors. The predictive system is organized hierarchically. If a prediction error is not adequately explained at a lower level of the hierarchy, it is passed up to a higher level as something which is *unexplained*. Ascending prediction error is surprising insofar as it signals experiences which are not understood, not anticipated, and not cognized. What is explained falls on the side of prediction, that which the agent (the predictive model) believes and takes to be its reality (Friston, 2012).

5.3. Prediction error and affective consciousness. In the free energy principle, affective consciousness is a major form of prediction error. Specifically, affective consciousness signals *salient* prediction errors. As discussed, affective consciousness is generated by systems which govern needs in the body and in the brain. Deviations from homeostatic setpoints (i.e., unmet needs) in these systems generate affective consciousness, which motivates the organism to generate predictions which explain and remove the ascending prediction errors.

In an ideal state, where all needs are perfectly satisfied, there would be no ascending affective consciousness (i.e., there would be no prediction error), and the brain would

⁶Capitalization follows Panksepp’s convention which calls for a specific lexicon when discussing neural circuits.

have no need to predict. In such a case, there would be perfect zombiedom with no need for subjectivity or consciousness. Solms (2019) proposes that, due to the complexities of life, this thankfully never happens. I will return to this point below.

It is notable that Solms' model suggests that affective consciousness – the root of all consciousness – is originally something which is surprising and unexplained by the cognitive (predictive) system. This view of consciousness differs considerably from traditional approaches which take consciousness as self-reflective (e.g., Lacan, 1978). Affective consciousness does not come with a 'stamp' signaling that it belongs to the individual. One's sense of agency and self resides in the domain of prediction, not prediction error (Friston, 2012). One must *infer* which prediction errors belong to oneself, a process which is mediated by the primary caregivers (Fotopoulou & Tsakiris, 2017). In other words, the body is first encountered as unexplained, as other, as prediction error. Construction of a predictive model about the internal body requires the intervention of the Other. This avoids the criticisms of Bassols (2019) who attacks Damasio's (2010) clean neural division between internal and external. Predictive inferences of the self are not innate givens. Affective consciousness (prediction error within the brain) highlights this extimate dimension—prediction error is what is unexplained (outside of) prediction yet an intimate part of prediction (Dall'Aglia, 2019b).

Friston and Solms (2018) discuss the mathematical formulae of the free energy principle which explain *both* the subjective perspective⁷ (of the necessity of non-representational affective consciousness) and the objective perspective (of the computational theory concerning predictions and prediction errors which has been mapped onto neuroanatomy; see Parr & Friston, 2018). It is beyond the scope of this paper and my expertise to describe in detail these formulae. The essential point is that Solms' model aims at a level of formal abstraction. While this is not the same as Lacan's formalization, it illustrates that neuropsychanalysis does not take the brain to be a site for grounding psychoanalytic theory. Redmond's (2015) contrast between the Lacanian subject as approached from topology and the neuropsychanalytic subject reduced to the brain does not stand in this model. It is truly integrative meta-psychology, rather than a neuro-reductive paradigm.

One might argue that these neuropsychanalytic formalizations reflect the cognizable real of science, as opposed to the real without law of psychoanalysis. After all, it is rooted in empirical, quantifiable research. Does the free energy principle not reduce the subject to the predictive machinery of the Bayesian brain?

I highlight Solms' position that the ideal state of zombiedom, perfect prediction, never occurs. In other words, the Bayesian brain *fails* in its predictive strivings. What if, instead of seeking the cause for this imperfection in the complexities of the external world,

⁷One should note how this approach *does* account for the qualitative feeling of subjective experience (something which Rowan (2019) claims that neuroscience is incapable of grasping) by illustrating the absolute necessity of affective consciousness.

as Solms does, we take a more radical stance? What if the reason for the persistence of affective consciousness⁸ which sustains subjectivity is a fundamental fault within the brain itself?

I refer to Johnston's intracerebral non-relation. The discord between ontologically out-of-joint brain systems – most notably between non-representational, non-declarative affective consciousness and representational, declarative cognitive consciousness – prevents any perfect, harmonious relationship within the brain. In line with Lacan's 'there is no sexual relationship,' the formulation that 'there is no intracerebral relationship' discerns that there is no *formula* which can perfectly connect the systems of the brain. In terms of the free energy principle, there is no formula for the prediction which will eliminate all residual prediction error or affective consciousness (Dall'Aglio, 2019b).

In this view, the formalizations of neuropsychanalysis are not so different from those of Lacan. Just because there is no sexual relationship did not prevent Lacan from creating formulas of sexuation. The point is to formalize the impasse within formalization. While the formulas proposed by Solms and Friston (2018) do not aim to expose some fundamental impossibility, one can still recognize the irruptions of *jouissance* which drive holes in cognition or prediction (Vanderveken, 2018). Although the brain functions as a probabilistic prediction device, the irreducibility of prediction error testifies to an imperfection within this probabilistic function. The brain is therefore not simply a "probabilistic automaton," as argued by Díaz (2019). This characterization misses the fundamental position given to affective consciousness and prediction error. It is therefore possible to observe that: (1) the brain is not reducible to biology insofar as subjective and objective perspectives sit at equal (albeit different) perspectives (cf. dual-aspect monism) in neuropsychanalytic formalization and (2) an internal rupture can be situated within the brain (cf. intracerebral non-relation).

Ansermet (2019) briefly comments that the "biological properties that establish a discontinuity from which the unconscious proceeds are not the unconscious." I wholeheartedly agree on this point. The impasse on the side of the brain is not necessarily symmetrical to the impasse on the side of the mind (cf. the formulas of sexuation, Copjec, 2015). However, this is not a rejection of a relation between the two fields. Ansermet reminds us that one must bring the "beyond the biological while including the biological."

6. WHAT CAN (LACANIAN) PSYCHOANALYSIS LEARN FROM NEUROSCIENCE?

I have argued that neuroscience (via neuropsychanalysis) meets the criteria for an interface with Lacan because of its avoidance of bio-reductionism and its recognition of an internal, structural impossibility. Nevertheless, it remains a question of what psychoanalysis (not only its Lacanian version) can *learn* or *benefit* from this interface⁹.

⁸This focus on some irreducible (non-predictable) prediction error fits with the characterization of Kandel's work on memory by Mauas (2019). In this neuropsychanalytic model, a memory is a prediction (Solms, 2015a). The arousal of affective consciousness prediction error causes the cortex to adjust its predictive model – that is, it dissolves the prior associated prediction (the memory). This illustrates how this neuropsychanalytic model can approach both the unconscious as knowledge (memory-trace, prediction) and the unconscious as real (gap, rupture, prediction error).

⁹Blass & Carmeli (2007, 2015) have directly argued that psychoanalysis cannot learn anything from neuroscience. I have addressed their argument elsewhere (Dall'Aglio, in press). Here, I intend to develop my argument particularly with respect to Lacanian psychoanalysis.

On this issue, I reiterate that the brain is split. There can be no guarantee of knowledge from the brain. Any interface between psychoanalysis and neuroscience *cannot* seek a specific answer from neuroscience on how psychoanalysis should adjust its theory or change its practice. Neuropsychanalysis, therefore, should not be critiqued for not proposing specific answers. Arguments which amount to ‘psychoanalysis cannot learn anything from neuroscience’ (whether for epistemic or ontological reasons; e.g., Blass & Carmeli, 2007) misses the point because it places neuroscience in the position of a ‘subject-supposed-to-know’ and then criticizes it for failing to provide knowledge.

Instead, neuropsychanalytic dialogue is a space of open possibilities at the level of an exchange of concepts (Dall’Aglia, in press). To achieve this, one must first frame the brain from a psychoanalytic perspective. By establishing bridges between psychoanalytic concepts and neural functions, one can then observe relationships between psychoanalytic concepts through their neural manifestations. One can then return to the psychoanalytic field with new *possibilities* of relationships between concepts observed at the neural level. As Solms (2013) maintains, neuroscience is not the ‘final court of appeals’ for psychoanalysis. The theoretical soundness and clinical utility of conceptual relationships suggested by neuropsychanalytic dialogue must be judged within the clinical practice of psychoanalysis.

6.1. **Jouissance and pharmacology.** I will briefly discuss one area of exploration. On the question of the use of neuropsychanalysis, Éric Laurent makes a somewhat surprising proposal:

I propose, rather, a mediated use of the neurosciences for psychoanalysis, mediated by the quasi-immediate consequences of the contributions of neuroscience: namely, psychopharmacological medicines... The subjects take hold of substances and make them their objects of security, in addiction or measured usage. Whether for Prozac, or medicines for erectile dysfunction, or attention stimulants, off label usage testifies to the manner in which medicine can be an instrument for exploring the body and its *jouissance* in multiple types of use. It is for their derived capacities for which they are used, that they are inscribed in our lives, *unbedded*. (Laurent, 2008)

Rather than disavowing the link between *jouissance* and neurotransmitters as Vanderveken (2018) does, Laurent suggests that pharmacological medications can be a way of exploring the body as a body of *jouissance*. Laurent (2016) explores this issue further, particularly with respect to the new field opened by psychopharmacology, its position within the symbolic, and its relationships to the libido. I will attempt to add some details to this proposal in relation to the neuropsychanalytic model discussed above.

The first thing to note is that the great majority of psychiatric medications primarily operate on the major neurotransmitter systems which constitute the core of affective consciousness (Panksepp, 1998). One may therefore draw conceptual links between affective consciousness (and its position as salient prediction error) and *jouissance* (Dall’Aglia, 2019b). By applying the logic of the impasse, one should not dismiss Panksepp’s instincts as unrelated to the psychoanalytic drive. Rather, one should situate the drive as a rupture *within* instinct, the potential for the instinct to go beyond itself, beyond its own limits of pleasure and unpleasure. This is precisely what Laurent (2016) observes. The systems of

affective consciousness are not restricted to a homeostatic logic, and their ruptures are subject to the laws of contingency.

Study of affective consciousness (and the subject's attempt at modulating it via psychotropic drug use) can thereby open an alternative window to study *jouissance*. One might suggest a heterogeneity within *jouissance*. Panksepp argues for several qualitatively and structurally distinct systems of pleasure and unpleasure, not a single pleasure-unpleasure series. It would therefore be insufficient to highlight *jouissance* as that which ruptures the pleasure principle. This rupture must be considered along at least seven different axes of pleasure-unpleasure (each operating under one of Panksepp's instincts). Perhaps the use of different medications – which do not have identical effects on all these systems – could offer clues into the heterogeneous excesses of *jouissance*¹⁰.

Recall that the subject's capacity to differentiate between these qualitatively distinct emotional systems is a predictive achievement structured through the Other. For this reason, I am not simply suggesting that *jouissance* be divided into play-*jouissance*, rage-*jouissance*, attachment-*jouissance*, and so on. The space of affective consciousness – including patients' use of medications – is a space to explore new *possibilities* of thinking about *jouissance*.

Another potential area of conceptual exploration includes Solms' (2017) theory of the unconscious as automatization of non-declarative motor memories. This might put the idea of the materiality of the signifier – of speech as *act* – in a different frame (e.g., Bazan & Detandt, 2013). Additionally, conceptualizing consciousness not as self-reflective but as non-representationally affective would require a re-situating of consciousness in Lacanian theory. Also, psychoanalytic work with neurological patients (e.g., Morin, 2018) can provide a unique window into the organization of the mind when certain pieces are damaged. It is not necessary for Lacanians to interface with neuroscience, but a dialogue provides opportunities to consider theoretical concepts in a different light.

6.2. Immanent critical engagement with neuroscience. Additionally, I believe that Lacanian psychoanalysis can better critique neuroscience precisely through dialogue with neuroscience. Recall Vanderveken's (2018) assertion of an "ethical hypothesis of the unconscious." I believe that the underlying sentiment here is that psychoanalysis has a certain duty to remind the mental health field of the primacy of the unconscious and all that this implies: the dangers of reductionism, dismissal of speech, and so on. One might say that there is an ethical imperative for psychoanalysis to *act* in the face of the rise of neuro-cognitive discourse.

Retreating from the world of science (e.g., by rejecting the brain, neuro-imaging, evidence-based medicine, etc.) will not help psychoanalysis impact mental health discourse at large. Rejection of neuroscience as *irrelevant* to subjectivity will not convince people on the other side of the aisle to read Lacan with enthusiasm. The discipline risks ossification by retreating into old conceptual dichotomies (e.g., drive is not instinct) instead of embracing a critical engagement (e.g., drive as the excess within instinct). If psychoanalysis believes that the current neuro-cognitive discourse is missing a key aspect of the subject, then it is up to psychoanalysis to demonstrate it. This is possible

¹⁰As Laurent (2016) notes, this analysis of *jouissance* via medication must also consider the position of medications within the symbolic. But the medication is not reducible to its symbolic coordinates. Excessive eating is not identical to excessive opioid abuse, and opioids operate differently from stimulants (e.g., cocaine).

without sacrificing the key theoretical grounds of psychoanalysis. It is through an *immanent* critique and engagement with neuroscience that psychoanalysis can show its true force. With its unique emphasis on the subject, Lacanian psychoanalysis can flip dominant theories on their heads, emphasize impasses in existing models, and steer research in a direction which does not ignore the findings of psychoanalysis. Such engagement will help shift mental health discourse.

For example, it has long been repeated that psychoanalysis lacks evidence and is inferior to ‘evidence-based’ treatments (see Laurent, 2014). Rather than outright rejecting evidence-based methodology (and estranging those who have trained in such traditions), psychoanalysis should critically engage with this research. More rigorous studies have found that even short-term psychodynamic therapy is at least as effective if not more effective compared to other therapies (Shedler, 2010). One might also be surprised to find that research in neuroscience and psychology provides tremendous support for the basic principles of psychoanalysis in its Lacanian (Verhaeghe, 2004) and non-Lacanian (Solms, 2018) veins. Another example of conceptual support is the finding that surprise is *necessary* to drive reconsolidation (Solms, 2015a). Here, the Lacanian thesis of interpretation having a provocative effect (rather than explanatory understanding) finds support in the neuroscientific field and has the potential to flip predominant psychotherapeutic fields on their heads by using evidence *within* the field.

In other words, Lacanian psychoanalysis should engage with the ‘dirty bathwater’ of neuroscience if it seeks to change the discourse and not appear out-of-touch with contemporary science. Lacanian theory may indeed be one of the best ways to frame current research. It is up to the Lacanians to show their relevance—engagement with neuroscience will help along the way.

7. CONCLUSION

This paper has only briefly touched on the relationships between the intracerebral non-relation, prediction error, *jouissance*, and affective consciousness. A full discussion of these concepts is beyond the scope¹¹. However, I hope that this discussion illustrates the possibility for neuroscience to take seriously the very real conclusions of Lacan. A dialogue is indeed possible, and there are many fruitful opportunities for both sides.

Such a neuropsychanalytic project avoids the criticisms of Vanderveken and the discourse attacked by the PIPOL9 congress. It takes the Lacanian logic of negativity, the *no-thing*, not as a limit of dialogue but as requirement for its possibility. Indeed, there is *no-thing* in common¹² between the brain and the mind—that is precisely what a Lacanian neuropsychanalysis can explore.

¹¹Elsewhere (Dall’Aglio, 2019b), I have discussed this model more extensively, namely by understanding prediction error as *jouissance*, the excess which arises out of the ontological gap within prediction (i.e., the symbolic).

¹²Bassols (2018) broaches this point when he states: “Rather, [the unconscious and the brain] share that nothing that language introduces in the body by erasing the mark, the trace, of the real that is impossible to represent.” While I agree that the *no-thing* is what is fundamentally in common, Bassols’ way of reaching this conclusion oversimplifies the neuroscientific conclusion that understanding brain functions necessitates going beyond the brain. While this is certainly the case, this does not make the brain empty (see, for example, emotional needs intrinsic to the brain itself; Panksepp, 1998). In a Lacanian fashion, it would be more radical to seek the ‘beyond the brain’ within the brain itself.

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