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The dialog between psychoanalysis and neuroscience: what does philosophy of mind say?

O diálogo entre a psicanálise e a neurociência: o que diz a filosofia da mente?

Elie Cheniaux,¹ Carlos Eduardo de Sousa Lyra²

Abstract

Objective: To briefly review how the main monist and dualist currents of philosophy of mind approach the mind-body problem and to describe their association with arguments for and against a closer dialog between psychoanalysis and neuroscience.

Methods: The literature was reviewed for studies in the fields of psychology, psychoanalysis, neuroscience, and philosophy of mind.

Results: Some currents are incompatible with a closer dialog between psychoanalysis and neurosciences: interactionism and psychophysical parallelism, because they do not account for current knowledge about the brain; epiphenomenalism, which claims that the mind is a mere byproduct of the brain; and analytical behaviorism, eliminative materialism, reductive materialism and functionalism, because they ignore subjective experiences. In contrast, emergentism claims that mental states are dependent on brain states, but have properties that go beyond the field of neurobiology.

Conclusions: Only emergentism is compatible with a closer dialog between psychoanalysis and neuroscience.

Keywords: Philosophy of mind, mind-body problem, psychoanalysis, neuroscience.

Resumo

Objetivo: Apresentar uma breve revisão sobre como as principais correntes da filosofia da mente, monistas e dualistas, se posicionam sobre a questão mente-corpo e relacioná-las com os argumentos favoráveis e contrários a um diálogo mais estreito entre a psicanálise e a neurociência.

Métodos: Foi realizada uma revisão bibliográfica de estudos nas áreas de psicologia, psicanálise, neurociência e filosofia da mente.

Resultados: São incompatíveis com um diálogo entre psicanálise e neurociência: o interacionismo e o paralelismo psicofísico, por negligenciarem os conhecimentos sobre o cérebro; o epifenomenalismo, por considerar a mente como um mero efeito colateral da atividade cerebral; assim como o behaviorismo analítico, o materialismo eliminativo, o materialismo reduutivo e o funcionalismo, por ignorarem as vivências subjetivas. Diferentemente, o emergentismo considera que os estados mentais dependem dos estados cerebrais, mas apresentam propriedades que vão além do âmbito da neurobiologia.

Conclusões: Somente o emergentismo é compatível com uma maior aproximação entre essas duas áreas do conhecimento.

Descritores: Filosofia da mente, problema mente-corpo, psicanálise, neurociência.

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Introduction

Sigmund Freud began his career as a neuroanatomist and neurologist and published several neuroscientific studies on topics such as cerebral palsy and aphasia.¹ In 1895, he wrote *The Project for a Scientific Psychology*, in which he created a general theory of human psyche based on the models of thermodynamics and in the very rudimentary neuroscientific knowledge of the time.^{2,3} Later, when developing psychoanalysis, Freud apparently moved away from what we currently call neuroscience. However, he believed that mental phenomena have a biological substrate until the end of his life.⁴ In one of his last papers,⁵ he maintained that psychoanalysis should occupy its place among all other natural sciences. Moreover, other authors, such as Brook,⁶ believe that Freud never left the mechanist and neuroscientific model of the *Project*, concealed in his metapsychological concepts, which, in his works, coexisted with psychological concepts, originated in clinical practice.

In the last decades we have witnessed an attempt to approach, or re-approach, psychoanalysis and neuroscience. The aim of the *Neuropsychanalysis* journal, first published in 1999, is to promote the dialogue and the integration of these fields.⁷ The International Neuropsychanalysis Society has organized annual conferences since it was founded in July 2000, in London.⁸

According to several authors, the dialog between psychoanalysis and neuroscience may be profitable for both, and, specifically for psychoanalysis, an anchorage in neurobiology may bring greater refinement to its theories.⁹⁻¹⁵

At the same time, some authors^{16,17} clearly oppose any closer association between psychoanalysis and neuroscience because concepts, theories and investigative methods of the two areas are fundamentally different and cannot be connected in any way. They believe that only those events that occur in the analytical setting are relevant for psychoanalysis.¹⁸ Other authors argue that neuroscientific findings do not contribute to the understanding of meanings, the essential matter of psychoanalysis.¹⁹

In face of this controversy, any position should be particularly based on the study of the philosophy of mind, the branch of philosophy that addresses the mind-body problem.²⁰ In this study, we summarize how the main currents of philosophy of mind define their concepts in relation to the arguments for and against a closer dialogue between psychoanalysis and neuroscience.

The mind-body problem

The mind-body, or mind-brain problem is defined by the question about what type of relationship exists between our inner or subjective experiences and our brain functioning.²¹ The answers to this question divide the currents of philosophy of mind into two groups: substance monism and substance dualism.

According to the dualist view, mind and body are different types of substances whose properties are incompatible. The body is material, and material objects are extended in space and may be observed objectively. Brain functioning and human behavior are public, or, in other words, observed through a third person perspective. In contrast, mind (or soul) is immaterial and does not extend in space; mental events are private and can only be observed by the own individual. According to monism (or materialism), however, only the physical world exists, and nothing is immaterial.²⁰ The idea of a spiritualist monism, in which there is no body, has practically no followers.

Both monism and substance dualism are, in turn, subdivided into several philosophical currents, as shown in Table 1.

Dualist currents

Interactionism

René Descartes,²² the main representative of the dualist view of the mind-body problem, aimed to conduct a systematic reformation of knowledge in both philosophy and sciences using a method, called the hyperbolic doubt, which consisted in never accepting as true anything that raised any degree of doubt.²³ Descartes defined that the basis on which one may build knowledge was the existence of an "I", or *res cogitans* (mind), whose main property was thought, which he distinguished from *res extensa* (body), whose main property was, in turn, extension. Descartes²² also defended the existence of God as the ontological principle for the existence of an "I" and all that might be known when using his rational method.

Table 1 - Main currents of philosophy of mind

Substance dualism	Substance monism
Interactionism	Analytical behaviorism
Psychophysical parallelism	Physicalist or reductive materialism
Epiphenomenalism	Functionalism
	Eliminative materialism
	Emergentism

He believed, moreover, that mind and body, although separate, affect each other, and that their interaction might happen in the pineal gland.

The mind-body problem has been based, since the onset of modernity, on Cartesian philosophy, and the method developed by Descartes influenced a series of philosophical and scientific discussions about the mind and its relation to the physical world.²⁴

Psychophysical parallelism

According to Leibniz,²⁵ mind and body do not affect each other, but mental and physical phenomena are parallel, simultaneous and correlated, which is ensured by God's intervention.

Epiphenomenalism

According to this philosophical current, mental phenomena are merely epiphenomena, that is, collateral effects of brain activity. Therefore, the mind does not have any causal efficacy in relation to behavior; it does not determine our actions²⁶ and is, in fact, a mere byproduct of the brain, as bile is a byproduct of the liver and urine, of the kidneys.²⁷

Coherent with epiphenomenalist principles are the results of experiments carried out by the neurophysiologist Ben Libet and his colleagues. When studying a simple motor act, such as raising a finger, he noticed that volunteers became aware of wanting to move it about 200 ms before the act was actually performed. However, their electroencephalograms recorded the readiness-potential 500 ms before the action. The authors concluded that the decision had, in fact, been first made by the brain; 300 ms later, the brain communicated its decision to the mind, which, in turn, had the illusion of being in command.²⁸

The withdrawal reflex follows the same principle. We automatically pull away our hand when we touch something very hot, and only later we become conscious of the heat or pain, that is, of the motive for the movement.²⁶

Criticism to dualism

Since the 20th century, almost all philosophers have opposed the dualist perspective on the mind-body problem. The idea of immaterial substances, either mind or soul, is rather imprecise, as it can only be characterized negatively, that is, in opposition to the material world.²⁰ Interactionism and psychophysical parallelism do not provide any acceptable explanation about how something incorporeal may affect the physical world. Therefore, substance dualism is incompatible with science, but closely identified with religion.²¹

Specifically in epiphenomenalism, questions are raised because mind and consciousness are not, in fact, synonyms, as most mental events are unconscious. Therefore, Libet's experiments may not lead to the conclusion that mental activity initiated only when the decision to make the movement became conscious.²⁶

Monist currents

Analytical behaviorism

The most important authors in analytical behaviorism are Gilbert Ryle and Carl Gustav Hempel.²¹ This philosophical current abandoned the use of mind, consciousness and subjectivity constructs. Instead of mental terms (desires, beliefs, intentions), analytical behaviorists claim that constructs should be analyzed semantically, that is, according to logical propositions (behavioral hypotheticals, such as "if-then") that express behavioral dispositions.^{29,30} For them, the mind does not exist, and this word merely expresses a concept created to name real or potential behaviors (dispositions) exhibited by people. There is nothing immaterial or mysterious behind our observable actions; or, in other words, and in contrast with dualist theories, the idea of a ghost (mind, soul or spirit) within the machine (body or brain) does not make sense.³¹

At least two questions may be raised about analytical behaviorism. The first is about the way analytical behaviorists replace any direct reference to mental states with the use of behavioral hypotheticals. As already pointed out, instead of simply assigning a mental state to an organism (e.g., feeling hot), they say that it expresses the disposition to behave in a certain way under certain environmental conditions (e.g., turn on the air conditioner on summer days). Therefore, the number of behavioral hypotheticals that somehow indicate a certain disposition to a behavior (e.g., feeling hot) may be, in some cases, indefinite (e.g., have some ice cream on hot days; swim in Copacabana when the temperature reaches 40° C in Rio de Janeiro; turn on the fan at night in very hot inland towns, etc.). The other point is that some of these mental states, such as dreaming, for example, cannot be explained by behaviorists, as most are not expressed in observable behaviors.²⁴

Physicalist or reductive materialism

Physicalist or reductive materialism is associated with the theories of identity. In the philosophy of mind, this construct was first described in the end of the 1950s by a group of philosophers – Feigl, Place and Smart. According to these authors, mental states are brain states, and,

therefore, physical states, as water is the same thing as the molecule made up of two hydrogen atoms and one oxygen atom, and lightening is the same as an electrical discharge from a cloud to the ground. Using "mind" instead of "brain" is a mere linguistic resource that will be rendered useless once brain activity has been better understood. Sometime in the future, technological advances will ensure that the examination of the brain alone is enough to reveal everything about what we now call mind.^{20,21,29}

In fact, there are two identity theories: type identity theory, and token identity theory (token-token). According to the first, mental events, states and processes are identical to the neurophysiological events, states and processes that take place in the brain.^{29,30} In this case, identity theorists accept that existing mental causes are equivalent to the causal properties of neurophysiological processes. In other words, a brain state corresponds to a certain mental state at any time and in any person, as the relationship is universal. Such understanding has received considerable criticism because it does not explain the existence of *qualia* (see below). Moreover, the type identity theory does not stand up to the argument of multiple realization, according to which a mental state may be realized by different physical states.²⁹

In face of such criticism, some identity theorists started defending that there is no identity between types of mental events, states and processes and types of brain events, states and processes, although there may still be some other form of identity not dependent on strict laws.³² According to the token identity theory, a single mental state may originate from different brain states. In other words, a brain state corresponds to a certain mental state at that time and within that person; therefore, different brain states are assigned to the same mental state.^{20,21,29} Additionally, this latter variation of the identity theory does not rule out the possibility that entities with "silicon brains", like machines and computers, may have mental properties.

The identity theory did not last long and was soon abandoned by most philosophers of mind, which opened space for the appearance of another theory about mental states: functionalism.²⁹

Functionalism

Functionalism originated in the studies about artificial intelligence and computational neuroscience. Functionalists, such as Hilary Putnam and David Lewis, believed that identity theorists were right about the existence of causal interactions between mind and body, or between mind and brain, but did not agree with their explanations for those interactions.³⁰ However, differently from physicalists, functionalists defended the existence of functional

relationships between mental states. Such relationships should be explained in accordance with the computational model of the mind and the information processing theory, according to which the mind is defined by its functioning and, therefore, should be similar to a computer program. In sum, functionalists usually claim that the mind is the software, or computer program, installed in a piece of hardware: the brain, as a kind of digital computer. In this case, as the mind is a computer program, then the software does not depend on the existence of a material substrate and may function in any piece of hardware, such as the human brain, a machine with a silicon brain, and an extraterrestrial with a silicon brain.^{20,29}

According to the philosopher John Searle,²⁴ the computational model described by functionalists does not provide an adequate explanation of mental states, as computation involves the manipulation of symbols, that is, syntactic properties not intrinsic to physics, but always relational to the observer. Computational syntax has no causal capacities, as computation is not intrinsic to physical phenomena, but is assigned to the physical world by means of the interpretations made by the observer. Moreover, still according to Searle,²⁴ mental states, different from computer programs, are defined by the fact that they have semantic contents.

Eliminative materialism

Eliminative materialism, or eliminationism, was first introduced by P. K. Feyerabend in 1963,²⁹ and was later developed by the philosopher Katherine Wilkes and, more recently, by Paul and Patricia Churchland.²¹ Several authors see eliminationism as a more radical version of materialism in the philosophy of mind.^{21,24} Although consistent with the physical and neurobiological theories of brain functioning, eliminative materialism does not deal with *qualia* (see below) or the common sense explanation of our mental states, which it classifies as folk psychology, whose vocabulary it abandons and replaces with neurophysiological descriptions of behaviors. Eliminationists base their arguments on the history of science and claim that folk psychology, with its mentalist vocabulary, is doomed to disappear as neurosciences develop, in a process similar to the one experienced by folk astronomy, physics, chemistry and biology, which started to give way to their respective modern sciences in the 17th century.³³

One of the problems of eliminative materialism is the fact that those that champion this type of materialism believe that folk psychology is a type of primitive theory of behavior. However, we cannot classify folk psychology, that is, the common sense explanations that we use to describe our thoughts, feelings and actions, as a theory in the same sense as the one used to describe conceptual

constructs developed in sciences such as physics, chemistry and biology.²⁴ Moreover, we cannot simply eliminate the vocabulary that we use to describe our behaviors and mental states and replace it with a neurophysiological vocabulary, because both folk and scientific psychology explanations belong to an epistemic level that is different from the one associated with neurophysiology.²⁹

Several authors^{21,24,29} believe that the ideas defended by eliminationists are equivocal, because, in addition to not corresponding to the factual reality of subjective and qualitative states of the mind, they also do not represent a satisfactory solution for the mind-body problem.

Other criticism to materialism: qualia

As seen above, criticisms have been leveled at analytical behaviorism, physicalist or reductive materialism, eliminative materialism and functionalism. A common fault found in these philosophical currents is the fact that they fail to account for the existence of *qualia*. For philosophers of mind, *qualia* are conscious, subjective and private experiences, such as sensations, emotions and mental images. The actual experiences of seeing the color red or feeling the taste of salt are examples of *qualia*.^{26,29}

Qualia cannot be explained by direct objective observation of brain activity, that is, there is no neuroimaging test to tell us how the neuronal discharge in some areas of the brain translates into a certain mental state. This is associated with the so-called explanatory gap, which is the impossibility of understanding the move from the third person perspective to the first person perspective. Moreover, *qualia* can only be communicated in an incomplete form, that is, language is incapable of fully expressing experiences. Therefore, we are not able to describe, in words, what it is exactly to see the color red or to feel the taste of salt, and our descriptions might not be very useful for someone blind from birth or who has never tasted salt.^{20,21}

A specific argument against functionalism is that even if computers or robots were equipped with faithful copies of our brains, they, differently from humans, would not have a conscience or subjective experiences.^{20,21,24}

Emergentism

Emergentism is based on the concept of property dualism and the supervenience theory.

Property dualism does not oppose substance monism and, therefore, is coherent with the understanding that only the physical world exists. It does, however, claim that our body, in addition to physical properties, such as mass, volume and color, has mental properties, which are immaterial.²¹

Table 2 - Levels of complexity and associated scientific disciplines according to the supervenience theory (adapted from Davidson, 1980)

Levels of complexity	Associated discipline
Social groups	Sociology
Minds	Psychology
Living beings, cells	Biology
Molecules	Chemistry
Atoms, elementary particles	Physics

The supervenience theory was made popular in philosophy of mind by Donald Davidson.³⁴ Its premise is that there are several levels of complexity in nature, from elementary particles, the lowest, to social groups, the highest level. Each level of complexity is studied by different scientific disciplines (Table 2).

According to supervenience theory, more complex phenomena or properties depend on, that is, are supervenient on lower level phenomena or properties. However, higher levels are not reductive to lower levels. For example, biological events depend on the occurrence of corresponding physical events, but the other way around is not true. In contrast, physics alone does not fully explain biological phenomena.^{20,21}

For those that support emergentism, the mind is an emergent property of the brain. Emergent properties are defined as new characteristics that appear at higher levels of complexity that lower levels did not predict and that transcend the properties of its constituents.³⁵ Life is an example of an emergent property. We may have the same chemicals in two test tubes: oxygen, carbon and nitrogen. In one of them, we find only atoms and molecules, but in the other, we may see the formation of unicellular organism, that is, living beings. In the second test tube, something new has emerged, now at the biological level. The result is more than a simple mixture or sum of chemicals. Families and social systems are also said to have emergent properties, as a prognosis of their functioning cannot be made by observing individual behaviors alone.²⁶

Therefore, for emergentists, mental phenomena depend on brain phenomena, but the former cannot be reduced to the latter.²⁰ Mental phenomena cannot go against the laws of biology or physics, but may not be fully explained only on the basis of knowledge about brain activity.

The criticism made to emergentism is that it is not a proper theory; that is, not a hypothetico-deductive system with detailed and precisely defined hypotheses. It is only a working hypothesis in science and philosophy, waiting for scientific theories that may prove it. However, the same criticism may be leveled at the other monist currents.²⁷

Psychoanalysis, neuroscience and the philosophy of mind

We briefly reviewed the position of the main currents of philosophy of mind on the mind-body problem. A deeper analysis of each current was out of the scope of this study, as our single objective was to identify which currents may support a greater rapprochement between psychoanalysis and neuroscience, and which may be barriers against the dialog between these two fields of study.

As seen above, substance dualism defines that mind (or soul) and brain (or body) are distinct entities. In this model, we find at least three possibilities: mind and body interact with each other; mind and body function in parallel, but are correlated; or mind is merely an epiphenomenon of brain activity.

According to substance monism, however, only the physical, material world exists. In this sense, there is no mind; mental states are (are reductive to) brain states; the mind is a function of the brain; the mentalist vocabulary should be replaced with neurobiological descriptions of brain functioning; or, alternatively, mental states emerge from brain states.

Although substance dualism has lost ground in philosophy and science, in clinical practice mental disorders are still traditionally subdivided into psychogenic or organic, according to their etiology. This was the conclusion of a study in which 127 psychiatrists and psychologists of the Department of Psychiatry of the McGill University, in Canada, answered a questionnaire using clinical vignettes.³⁶ According to this outdated view, psychotherapy is the best treatment for mental disorders of a psychological origin, whereas psychopharmacotherapy is more appropriate to treat biological disorders.³⁷ This dualist perspective, however, has been challenged in several functional neuroimaging studies, which did not find any differences in changes in brain metabolism among patients that responded well to psychotherapy and those successfully treated with psychoactive drugs.³⁸⁻⁴²

The main dualist currents are clearly incompatible with the rapprochement between psychoanalysis and neuroscience. First, they contradict current scientific knowledge.²¹ In addition, if mind changes directly affected the body (interactionism), or if they were always followed by correlate changes in the body (psychophysical parallelism), it would be unnecessary to know the brain in details, as it would suffice to study the mind and learn how to act upon it.

For numerous psychoanalysts, recent advances in neuroscience and a deeper knowledge about mental functioning are totally irrelevant for psychoanalysis.⁴ They probably adopt a dualist perspective on the mind-body problem.

Epiphenomenalism, in which the mind is defined as a mere collateral effect of brain activity, as well as analytical behaviorism, eliminative materialism, reductive materialism and functionalism, all theories that ignore the subjective experiences, which are the focus of psychoanalysis, also exclude any possibility of a dialog between psychoanalysis and neuroscience.

A large number of neuroscientist classify psychoanalytic concepts as irrelevant and unscientific.⁴³ As most psychiatrists that follow a biological orientation, they probably favor reductive materialism.²⁶

Of the philosophical currents that we have examined, emergentism is the only one that seems to favor the dialog between psychoanalysis and neuroscience.²⁷ According to emergentism, mental states depend on brain states, but have properties that go beyond neurobiology. Therefore, both mind and brain are considered at the same time, but the mind is not described as something immaterial or separate from the body.

Final considerations

The discussion about the mind-body problem is fundamentally important for those that study or treat the human mind and behaviors. In general, psychoanalysts, neuroscientists, psychologists, psychotherapists and psychiatrists take a stand about this problem, even when unaware of it or not having ever studied the philosophy of mind, which undoubtedly and directly affects their clinical or scientific practice.

After this brief review of the main currents of the philosophy of mind, we concluded that only emergentism is compatible with a closer dialog between psychoanalysis and neuroscience.

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