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Some Remarks on the Mind-Brain Identity Theory

Abstract

The issue of the relation between the mind and the brain is known as one of the most discussed problem of the philosophy of mind. The recent development of neuroscience contributed significantly to animate the discussion on this subject. This article is one voice in this discussion. It contains a critical analysis of some arguments in favor of the theory which claims that the mind is identical to the brain. Moreso, it is argued, that the observed correlations between physical and mental events cannot be treated as a proof that there is no difference between the mind and the brain.

Keywords

Mind, brain, theory of identity.

The topic of the link between the human brain and the mind demands special study for a variety of reasons. The first is that, while this subject has long been discussed in the domains of psychology and philosophy, these discussions have always been entirely theoretical. Only in the last few decades has the growth of neurobiology, neurophysiology, and other natural sciences used to study the brain revealed the full complexity of this organ and, to a significant degree, allowed us to understand the mechanisms that allow it to function. The plane

of purely theoretical analysis was therefore augmented by a number of key empirical considerations, which cast a new light on the old problem of the brain-mind link. It is no surprise that representatives from a wide range of disciplines, including medicine, cognitive science, philosophy of the mind, anthropology, cognitive psychology, linguistics, and even theology, were immediately drawn into the debate.[1] Even if each of these groups has a different assessment and interpretation of this problem, they all agree that it is a momentous and important issue for various reasons, and that its explanation is of fundamental importance for the future of each of these areas. The interdisciplinary nature of this task, as well as its importance, are further reasons for taking a closer look at it. This type of reasoning also has a strong ideological overtone to it: deciding what the mind is in reality, and what relationship it has to the material brain, has obvious implications for the interpretation of the age-old problem of the human ontic structure, namely, whether it is a material being or a material and spiritual being.

The goal of this study is to conduct a critical analysis of a few selected arguments cited by supporters of the naturalistic interpretation, in which the identity of the mind and the body is assumed, rather than to present the history of this issue or to classify individual positions and opinions appearing in the discussion on the mind-body problem (the implementation of each of these two tasks would require writing an extensive and multi-threaded, or possibly even multi-volume monograph, not a short article).

1. The theory of the identity of the brain and the mind

Many current scientists studying the anatomy and function of the human brain are uninterested in answering the question whether the mind is the same as the brain. The fundamental reason for this is that they regard the subject of the brain-mind link as a philosophical one whose resolution has no bearing on their research. They concede, at most, that in this study, one may distinguish between a „simple" and a „difficult" topic that has to be clarified. Investigating what occurs in the brain while its owner thinks and feels itself and the world around them is a simple problem. Explaining what consciousness is and how it is

[1] Cf. J. Bremer, *Jak to jest być świadomym? Analityczne teorie umysłu a problem neuronalnych podstaw świadomości*, Warszawa 2005, Wydawnictwo IFiS PAN; M. Hohol, *Wyjaśnić umysł. Struktura teorii neurokognitywnych*, Kraków 2017, Copernicus Center Press.

„produced" by the brain is a difficult problem. There is no shortage of scientists dealing with this topic who believe that the answer to this problem is „science's last frontier."[2] How should study on this „last frontier of science" be conducted? One of the key methodological rules[3] followed by empirical sciences suggests that while describing this issue – or any other scientific question – no intangible aspects should be included, as they are by definition, inaccessible to the empirical method. It is no surprise that a neurobiologist following the methodology of his discipline will try to explain the nature of the mind by limiting consciousness to physicochemical processes in the brain, without taking into consideration any aspect of a non-material nature.

However, it is well recognized that a methodological assumption frequently becomes an ontological assumption that already determines a scientist's worldview – in this example, a naturalistic (materialistic) worldview. This also occurs when the scientist is uninterested in ontology and fails to recognize that the methodological rule he followed when working with the brain and consciousness has inadvertently evolved into an ontological rule defining his worldview. This approach to the brain-mind dilemma is a form of „hidden assumption" that sits at the heart of brain science.

The neuroscientists' inclination is to link awareness to the brain's electrical activity. The mind is nothing more than the material brain, according to this view, which is also known as a theory of the identity of the brain and mind, typical physicalism, or central state materialism. At this point, it is worth noting the philosopher Daniel Dennett's comment, which supports this stance by stating briefly: „The concept of the mind as something separate from the brain, created not of ordinary matter, but of something special, is a dualism that is rightly infamous (…). Materialism is the dominant viewpoint, which is stated in a variety of ways and backed by a variety of arguments: there is only one sort of substance, or matter – a physical substance in physics, chemistry, and physiology – and the mind is somehow merely a physical reality. To put it another way, the mind is the brain."[4]

There are several indicators that Dennett's viewpoint is still held by the majority of scientists working on the human brain. According to proponents

[2] S. Rose, *Brains, Minds and the World*, in: *From Brains to Consciousness*, London 1999, Penguin, p. 1.

[3] „Methodological naturalism" is the most common term for it.

[4] D. Dennett, *Świadomość*, Kraków 2016, Copernicus Center Press, p. 50.

of this solution, identifying the mind with the brain allows them to deal with a relic of a bygone era once and for all, namely, the dualistic philosophy, which, thanks to Descartes, introduced and then consolidated the „dogma of the spirit in the machine" at the dawn of modern times.[5] The most straightforward method to eradicate „the Descartes fallacy"[6] from current neuroscience is to acknowledge that there is no immaterial „spirit" and to agree that the mind and the brain have an identity relationship.

What does it mean to identify these two concepts? What does the mind-brain identity hypothesis suggest, in other words? In a nutshell, it holds that human consciousness – along with associated processes like thinking, remembering, feeling emotions, paying attention to particular objects, perceiving and identifying things and people, introspection, and so on – is nothing more than brain electrical activity (or more broadly, the entire nervous system). This means that every manifestation of mental life – every idea, impression, and emotion felt – is a purely physical occurrence involving a jump of electric charges or neurotransmitters between synapses of neurons in a specific area of the cerebral cortex. Most importantly, according to this understanding, mental events (thoughts, feelings, emotions, etc.) and the associated changes in brain cells are not two separate processes, one non-physical and the other physical; rather, they are one and the same occurrence, totally physical in character.

The observed links between acts of consciousness and physico-chemical changes in specific parts of the brain are the most fundamental support for the notion of brain-mind identity. Magnetoencephalography (MEG), positron emission tomography (PET), functional magnetic resonance imaging (fMRI), electroencephalography (EEG), functional near-infrared spectrography (fNIRS), and single photon emission tomography (SPECT) are some of the modern brain imaging techniques that allow for precise dependence between these two levels of brain activity. Every mental event (every thought, emotion, act of introspection, etc.) correlates to a precise change in some area of the cerebral cortex, which is now beyond dispute.[7] The occipital lobe of the cerebral cortex, for example, handles image processing; the parietal lobe handles movement, direction, and computation; the temporal lobe handles speech, memory, and sound analysis; and the frontal lobe handles thinking and planning. Although certain

[5] G. Ryle, *Czym jest umysł*, Warszawa 1970, PWN, p. 48.

[6] Cf A. Damasio, *Błąd Kartezjusza. Emocje, rozum i ludzki mózg*, Poznań 1999, Rebis.

[7] Cf. R. Carter, *Tajemniczy świat umysłu*, Poznań 1999, Oficyna Wydawnicza Arena.

regions of the brain „specialize" in the execution of specific tasks, most of the time this implementation also necessitates a lot of activity in other areas.[8] Most importantly, the link between conscious experiences and brain electrochemical changes is not demonstrated simply by passive reporting of these changes. Experiments involving active interference with the structure of the cerebral cortex and activating (e.g., with electrical impulses) regions responsible for certain activities have produced a number of solid reasons in favor of the notion of the identity of the brain and mind.[9] The evident impact of drugs and different types of pharmacological substances (particularly psychotropic chemicals) as well as some chemical molecules (e.g., nitric oxide) on human awareness is an equally compelling argument.[10]

2. "Correlation is not causation"[11]

The well-established links between mental processes and corresponding changes in the appropriate brain areas are the major argument of proponents of the brain-mind identity theory. But there is a catch: correlation is not the same as identification. The great majority of authors who embrace the theory of identity, on the other hand, do not appear to notice this. It is no surprise therefore, that their general argumentation starts with a slew of research findings establishing the link between consciousness and the brain, followed by a smooth transition to the conclusion that these two entities are one and the same. This, however, is a fundamental logical fallacy that is frequently and naively repeated in scholarly articles devoted to the subject at hand.

When understanding what qualia actually are, this fallacy is an excellent example of how they arise. Qualia refers to „perceptible or phenomenal properties linked with experiences"[12], such as hearing sound, seeing color, experiencing pain, and so on. „All the sensations trapped in our thoughts (…) that

[8] Cf. A. Chmielewski, *Między mózgiem a świadomością. Próba rozwiązania problemu psychofizycznego*, Warszawa 2001, Wydawnictwo IFiS PAN, pp. 103–170.

[9] Cf. K.D. Davis, *New Techniques for Examining the Brain*, New York 2007, Chelsea House Publishers.

[10] Cf. J.A. Hobson, *The Dream Drugstore. Chemically Altered States of Consciousness*, Cambridge 2001, The MIT Press.

[11] S. Rose, *The 21st Century Brain*, p. 238.

[12] S. Blackburn, *Oksfordzki Słownik filozoficzny*, Warszawa 1997, Książka i Wiedza, p. 333.

we methodically identify with certain objects"[13] is a less exact but intuitively accessible definition of what qualia are. To figure out what these „sensations" are and what is going on „in our minds", one employs the well-known psychological technique of introspection, which is observing and analyzing one's own subjective feelings, thoughts, and other states of consciousness. Of course, many people are unfamiliar with the concepts of introspection and qualia, as well as how the human brain functions, but those who can compare these two different levels of reality description can easily see that this is all that makes up the directly perceived stream of consciousness, which appears to be quite different from the physicochemical changes occurring at the same time in the brain. It is impossible to quantify the magnitude of this sort of subjective sensation of the difference between mental states and the associated physical events in the brain in this situation, but it is probably not an exaggeration to say that it is a regular occurrence that everyone has.

Supporters of the notion of the brain-mind identity are likely to feel the same way, but most of them dismiss introspection as a sign of primordial „folk psychology" which, according to Paul Churchland, philosopher of the mind, eventually cracks down on neuroscience.[14] Because it is founded on the idea that „our ability for inner observation or introspection discovers things as they are in our inner nature", the philosopher feels the introspective argument is „seriously questionable."[15] Meanwhile, Churchland continues his argument that it is known from elsewhere, that this assumption is false for the senses of sight, hearing, and touch: the surface of a red apple, the sound of a flute, and the warmth of lukewarm air are not what they appear to be. In fact, the surface of an apple is „a matrix of particles reflecting photons of certain critical wavelengths", the sound of the flute is „a sinusoidal compression of a wave train in the atmosphere" and the warmth of the air is „the average kintetic energy of millions of tiny particles."[16] Churchland concludes that human fears, hopes, and beliefs, are not what they appear to be – states of consciousness. Rather, they are physicochemical changes in the appropriate brain areas.

This reasoning is a classic example of a vicious circle, which appears twice here: the cited examples of exploring the world through methods other than

[13] D. Casacuberta, D, *Umysł. Czym jest i jak działa*, Warszawa 2007, Świat Książki, p. 89.

[14] P. Churchland, *Matter and Consciousness*, Cambridge 1988, MIT Press, p. 144.

[15] P. Churchland, *Matter and Consciousness*, p. 15.

[16] P. Churchland, *Matter and Consciousness*, p. 15.

introspection (observing the surface of a red apple, listening to the sound of a flute, feeling a gust of warm air) are in fact related to the qualia which, according to Churchland, are clearly identified with the corresponding physical events at the point of output. The conclusion obtained from the study of these cases (that states of consciousness are nothing more than physicochemical changes in the brain) is thus only a reiteration of the initial premise. Churchland's conclusion that introspection is difficult to believe because it is a consciousness of how the world looks to us, rather than an understanding of the physical and chemical structures behind a perceived item or event, is based on the same premise. By definition, introspection is a direct insight-awareness into the content appearing in consciousness, so the visual, auditory, tactile, and other qualia are the same, regardless of one's knowledge of the physicochemical processes underlying what appears in the stream of consciousness in a given case. Knowing or not knowing that an apple's surface is „a matrix of particles reflecting photons of certain critical wavelengths" has no bearing on the fact that an object made up of „arrays of photon reflecting particles of certain critical wavelengths" is recognized and perceived as a red, juicy, sun-scented apple in the stream of consciousness. The conclusion that the argument from introspection is „seriously questionable" is therefore the result of Churchland's thinking, in which he believed from the start that qualia are identical with brain activity, not only connected with it.

The same premise allows Churchland to look at additional instances of the process that causes qualia to emerge (seeing colors, smelling things, etc.) and characterize his findings as „simply equivalent to, say, a succession of stimuli (peak frequencies) in the appropriate sense pathways."[17] „It is astonishing that such an eminent philosopher of mind can make such a mistake, which, I suppose, is produced exclusively by his firmly dogmatic naturalism"[18], John Hick remarks soberly, referring to Churchland's ease with which he equates correlation with identity.

[17] P. Churchland, *Matter and Consciousness*, p. 149.

[18] J. Hick, *Nowe pogranicze religii i nauki. Doświadczenie religijne, neuronauka i Transcendentne*, Łódź 2019, Wydawnictwo Uniwersytetu Łódzkiego, p. 142.

3. The rule of identity and typical physicalism

Nothing prevents the coherence and validity of the identity theory, which says that mental states are the same as the corresponding electrochemical changes taking place in the appropriate brain areas, from being analyzed via the lens of the identity law known from logic. This law states what is very well known that if two items have the same properties, they are considered identical. Do mental states and brain physicochemical changes have the same characteristics? The argument for a positive reply to this question is insurmountably complex, owing to the fundamental differences between mental states and the physical events that correspond to them.

Consider a hypothetical circumstance in which a patient is conscious and can respond to queries from a doctor who, using proper equipment, electrically stimulates the relevant areas of the patient's brain and monitors the patient's reactions, who articulates what is going on in his thinking at that moment. This doctor also records the electrical activity of these areas, which are triggered when the patient recalls anything from memory that fills him with pain, love, or happiness, even when there is no electrical stimulation of the brain. Although this distinction is so evident that it seems pointless to provide instances to demonstrate it, it is worthwhile examining at least one such case here for the sake of clarity. It turns out that electrical stimulation of the relevant area in the left hemisphere of the brain may make a patient feel instantly happy and laugh at the sight of a painting on the wall depicting an average horse.[19] When the patient imagines (without electrical stimulation) a lovely picture of the sun sinking over a mountain valley, where lush meadows are partially veiled by the shadow of the surrounding peaks, a similar interaction between the brain and consciousness emerges. Electrical activity in the proper brain areas that are responsible for this sort of aesthetic experience is reported to the doctor by the attached equipment.

According to the rule of identity, if the mind is the same as the brain, the physicochemical changes in the brain and the associated mental states have the same qualities.

Is it reasonable to argue that the frequency and intensity of the current, or the appropriate number of neurotransmitters flowing between neurons in the

[19] Itzhak Fried describes the impact of surgical intervention in the brain of a patient suffering from recurrent epileptic bouts; Cf. I Fried, *Electrical Current Stimulates Laughter*, „Nature" 391 (1988), p. 650.

appropriate brain centers, is an attribute, or an essential property, of the state of cheerfulness, as a result of which the patient begins to laugh, or of the boundless delight that appears at the memory of a beautiful sunset? The passage of electric charges or neurotransmitters can be accurately pinpointed in specific locations in the brain, but can the same feature (spatial location) be given, without contradiction, to the condition of cheerfulness or nostalgia paired with the joy evoked by the recollection of the setting sun? Can it be argued that good humor, which occurs in a state of cheerfulness, or the difficult-to-express-in-words sense of the mystery and majesty of nature that accompanies contemplation of the sun setting over the mountains, is one of the properties of neurotransmitters or electrons jumping between synapses of neurons? However, this boils down to the brain-mind identity theory, which asserts that mental states and the associated changes in the brain have the same characteristics. Only by making this assumption can we ensure that the electrochemical activity recorded on the proper devices linked to the brain is identical to the patient's feeling of joy or ecstasy, as dictated by the law of identity.

Unfortunately, putting an equal sign (which denotes numerical identity) between these two levels of human brain activity is not only illogical, but also ludicrous. It is difficult to disagree with British philosopher Jonathan Lowe, who says, in response to this situation: „I feel that the thesis that mental processes are just physical states cannot even be grasped."[20] Lowe's skepticism extends beyond the intuitively perceived distinction between mental and physical states to the coherence and logical sense of assertions about the brain-mind link, possibly even more so. In this case, it is reasonable[21] to claim that physicochemical changes in the brain enable, cause, or create specific states of consciousness, and that the mind would not be able to operate without these changes in the brain. But it makes no sense to believe that brain changes are identical to mental states.

From the analysis of the example described above, there can be drawn some conclusions which proponents of the theory of the brain-mind identity must either completely disregard, recognizing that, for some reason, the principle of identity does not apply to the issue discussed above, or dismiss them as another manifestation of „folk psychology", which is a relic of a bygone era that

[20] J. Lowe, Self, *Agency and Mental Causation*, „Journal of Consciousness Studies" 6 (1999) 8–9, p. 235.

[21] Whether this is true or untrue is a separate question.

will eventually be discarded by neuroscience. The latter argument, which questions introspection as a method of insight into one's own states of consciousness, leads his adherent to a dead end, because the conclusion that introspection is a manifestation of „folk psychology" is born in his own head, just like all of his other thoughts and subjective feelings, and it is introspection that makes him realize that he has just come to the conclusion that introspection is a flawed method. This reasoning's vicious loop is a hint that this route of introspection will be difficult to overcome. Furthermore, it is reasonable to question whether any proponent of the identity theory truly believes what is evident from his own declarations: that the emotions he experiences, such as sadness, regret, anger, delight, love, pain, and so on, are identical to the electrochemical changes in his brain. The use of the word „believes" in the previous sentence was not by chance. The aspect of philosophical faith in the rightness of a viewpoint appears totally natural in the understanding of the brain-mind dilemma, which has a strong worldview overtone. The objective is that it should be a reasonable faith, one that is well-founded and free of preconceptions based on a dogmatic approach to the subject. It is pointed out by Hick, who notes that the advocates of the brain-mind identity theory's major argument assumes, very easily, the shape of a thesis, which is neither an experimentally proven truth nor a conclusion formed from justified premises, but just a „confirmation of naturalistic faith."[22]

In certain settings, saying to members of the scientific community that their study is governed by faith rather than evidence and experimental results is considered an insult. This is due to the residue of positivism's view that science should be founded solely on facts, with no space for any faith – even philosophical faith. However, it has long been recognized that science cannot be reduced to a set of dry facts, and that interpretations of the theory of brain and mind identity contain an element of philosophical faith – in this case, the conviction in the correctness of materialism.

[22] J. Hick, *Nowe pogranicze religii i nauki*, p. 145.

4. The bat problem

There is an intriguing argument in Thomas Nagel's renowned piece „What is it like to be a bat?"[23] that confirms the accuracy of the previously presented findings. For the same reason, even the most complete description of a bat's anatomical structure, physiology, and habits does not provide a satisfactory answer to the question of what it's like to be a bat, neither does it provide the most comprehensive objective knowledge about the structure of the brain and all the attributes describing physicochemical changes correlated with mental events, nor an insight into what consciousness is in reality which, by definition, is consciousness.[24] Many signs suggest that the debate over the nature of mind is really about whether consciousness (and all other mental states) can be reduced to objective physical states or not. The core of Nagel's argument is that consciousness is a genuine phenomenon that cannot be captured by even the most comprehensive set of data concerning objective, physical states that are linked to mental states.[25]

This is a crucial situation that throws fresh light on the conclusions derived before from the law of identity applied to the idea of the brain and mind's identity. These findings can be debunked by pointing to the potential of forming two entirely distinct descriptions of the same occurrence, which can be observed and studied in various situations and given different sets of qualities, but which are still the same thing. „Strong electrostatic discharge in the atmosphere" is the same as „lightning that crosses the sky", but due to the difference in colloquial and strictly scientific language, each of these descriptions will refer to the same phenomenon (contrary to what is required by the law of identity!) with different sets of attributes. The problem is that the question being debated is not whether two physical phenomena can be the same despite being perceived and described differently, but whether there is an identity between the physical event (which is objective) and the mental event (which is subjective). In the case of lightning, such a mental occurrence would include consciously witnessing a flash of light and hearing the thunderous sound that follows the hit. This subjective

[23] T. Nagel, *Jak to jest być nietoperzem?*, in: *Pytania ostateczne*, Warszawa 1997, Aletheia, pp. 203–219.

[24] J. Searle, *Umysł*, pp. 91–92.

[25] According to Searle, this is due to the ontological distinction between objective physical states and subjective mental states. Cf. J. Searle, *Umysł*, pp. 99–102.

experience associated with someone who sees (and hears) lightning, according to Nagel's logic, cannot be reduced to objective facts about lightning since the former is a mental phenomena while the latter is a physical occurrence. Even if he understands everything there is to know about electrical discharge in the environment, someone who has never seen lightning with his own eyes will have no understanding of what is going on in the mind of someone who sees this lightning. He will not learn about it for the same reason that even the most detailed understanding about a bat's structure and life does not provide any insight into what it is like to be a bat.

The potential of generating two separate accounts of the same occurrence, which Hick refers to as the notion of double characteristics or a „bilingual" variant of the brain-mind identity theory,[26] is sometimes interpreted as follows: in the relevant area of the cerebral cortex, there is only one true physical event (e.g., the movement of electrons or neurotransmitters between neurons), but it has two distinct sets of attributes – one physical, the other mental. Each of them necessitates a separate language, so one and the same physical event is described either in physics and chemistry (after which he is awarded physical qualities) or psychology (then he is assigned mental attributes). Although the rule of identity appears to be broken in this situation, it is due to language disparities that arise when descriptions of the same phenomena are diverse, just as it did in the previous example with lightning.

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A critical reader of this essay, especially one who is sympathetic to the hypothesis of brain-mind identity, would almost certainly perceive that the complicated, multi-threaded, and multi-faceted problem has been „flattened" and maximally simplified. In truth, the idea of brain-mind identity has many distinct formulations, and its proponents offer a variety of arguments in favor of it, of which just one – concerning the brain-consciousness correlations – was examined in this brief research. Furthermore, even if they support the identity theory, not all neuroscientists and philosophers of the mind use the same severe and dogmatic interpretation as the scholars referenced in this article. Many people who are interested in this topic are going towards various types of functionalist theories

[26] Cf. J. Hick, *Nowe pogranicze religii i nauki*, p. 145.

or, for example, epiphenomenalism, after identifying the flaws in the „radical" version of the mind-brain identity theory.

The reason for not mentioning either of these „alternative" theories in this paper is simple: a single article in a scientific journal cannot be too long, so other arguments for the thesis that the brain and mind are identical (appearing in less „radical" versions of the discussed theory) will be discussed in another article. On the other hand, the reservation made in the introduction that only selected arguments in favor of the theory of identity will be subjected to a critical analysis here justifies, to some extent, the omission in this study of many important threads appearing in the discussion on the brain-mind problem.

The link between physicochemical changes in the human brain and corresponding mental events, is at the heart of the mind issue described in this article. Contrary to hopeful statements of proponents of the theory of identity, who say that by identifying both of these levels the problem is addressed, it still remains unknown what the mind is, and how subjective awareness originates from objective physicochemical processes in the brain. While the advancement of neuroscience has allowed for a better knowledge of the mechanism that allows the brain to work, it has not disclosed the mind's secret, which remains a mystery. Is the identity theory, which equates the brain with consciousness, sufficient to explain the puzzle? This is a question that the reader of this text must answer for him or herself.

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