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# Solving the mind-body problem through two distinct concepts: internal-mental existence and internal mental reality

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## Abstract

In a previous published paper, we initiated in this journal discussion about new perspectives regarding the organization and functioning of the mind, as a premise for addressing the mind-body problem. In this article, we continue focussing discussion on two distinct but interrelated concepts, internal-mental existence/ entity and internal-mental reality.

These two psycho-physiological subunits of the mind interact each other in the form of an internal-mental interaction, having no sense if one is isolated/ studied separately from the other. In other words, the mind (as a dynamic psycho-physiological construction) has no sense in the absence of this internal mental interaction that which takes places between internal-mental existence and internal-mental reality.

In the case of the `mind-body problem`, the tendency until now was to assign extremely complex functions of the mind (abstract ideas, consciousness, colors) to simplistic physiological/ neuronal structures. We hope that this paper opens a new perspective, in respect to complex/ interrelated neuronal structures that construct the mind through their interaction, a process that is both physiologically

(transmission of neural impulses) and psychologically (transmission of information), and that requires time (an immaterial component) to occur.

## Introduction

External reality is material (physical/ chemical) in nature, surrounding and interacting with the physical/ chemical receptors of the body (electromagnetic waves for visual cells of eyes, acids and bases for taste buds/ olfactory receptors, etc.) (1). Such information from the environment impinges on sensory receptors which transmit signals to the brain, where it is presented/ encoded in the form of either concrete (colors, sounds, tastes and smells, etc.) or conceptually abstract (profit, hierarchy, country/ continent, etc.) data (2). In so doing the brain actually generates an internal projection of the external reality, thus creating a distinct and veritable internal-mental reality, which is immaterial and becomes part of the conscious mind (3).

It is unknown how the immaterial/ intangible/ abstract domain of the mind is able to intervene, such that specific physical characteristics of the stimuli are either attended to, or alternatively essentially ignored in preference to abstracting meaning that is not inherently tied to those physical characteristics (think, for example, Morse code, or reading facial expressions). Furthermore, the decision making process, which may deploy abstract needs over concrete biological needs (eating, sleeping), is not understood. And finally, the abstract mind is even capable of integrating and elaborating specific motor responses that are abstract in nature, for example, motor participation of the hands, which shape/ place/ arrange in a virtual-imaginative space—a process that is currently unclear (4).

From a classical perspective, the concept of the mind has been approached in two extreme ways: *monism* posits that the mind can be explained in terms of a single reality, which may be either spiritual (abstract) or material (brain)—that is, one or the other. In contrast, *dualism* incorporates both of the described (spiritual and material) realities, but makes a rigid distinction between them. In their current iterations, neither theory is able to integrate/ interrelate the abstract information related to the mind with

the neurobiological support of the brain, a phenomenon known in the literature as "the mind-body problem" (5).

## **Discussion**

### *1. Computational perspective of the mind*

As a physiological parallel to the "mind-body problem" (the interrelation between abstract data and neurobiological support), we draw on the example of another physiological system that might provide an analogy for understanding the relationship between the mind and the body. Specifically, the circulatory system depends on two distinct factors: the "static" container system (the blood vessels) and the "dynamic" content (the circulating blood). Taken together, these two distinct factors generate the function of blood circulation/ blood pressure, which has no meaning if one constituent component is isolated from the other, that is, if reference is made only to the static container or, alternatively, to the dynamic content (6). Extrapolating to the mind-body controversy, the monistic view attempts to reduce the dynamic content of information to the static cerebral container (or vice versa), while the dualistic view considers the dynamic content of information as existing independently of the static cerebral container (5).

Based on the above example, the mind should incorporate both a material-static (neurological) container and a nonmaterial-dynamic (informational) content, which are complementary to each other (7, 8). Taken together, these two distinct constituent components compose the mind (a neuro-informational entity), which has no mental meaning if one component is isolated from the other. Thus, our mental existence ceases if the dynamic content becomes static—as when the processing/circulation of information is blocked through such procedures as hypnotics or general anaesthesia—or if the neurological support system is damaged—as when brain injury occurs (9). Generally, when the mind processes any type of abstract information, the psycho-physiological mechanisms involved are the same, but the responses differ depending on the type of information processed (10). Thus, the mind is able to

access and process distinct information in discrete sessions (cultural, religious, mathematics, gastronomy, sexual or related to its own self), somewhat similar to a computer that runs distinct applications in distinct sessions (11).

This computational model of the mind, proposed by Hilary Putnam in 1961 and popular among some cognitive theorists yet today, views the human brain like a computer, with the information being the programme run by the brain (12). The mind can thus be analysed from a general perspective, in terms of hardware and software computational components. At the same time, the mind also needs to be analysed from a psycho-physiological perspective (a more human/organic model than a computational model), in terms of internal-mental reality and internal-mental existence, as elaborated below (7, 8). Just as the mind has no mental meaning should one computational component be isolated from the other, then, in a similar way, the mind would have no mental meaning if one psycho-physiological subunit (e.g., internal-mental reality) is isolated from the other (e.g., internal-mental existence).

## *2. Psycho-physiological perspective of the mind*

According to a psychological perspective, the mind can functionally be divided into two distinct subunits, namely an internal-mental existence/ entity (human specific mental existence) and an internal-mental reality (internal projection of the external reality) (7, 13). In terms of consciousness, this dual psychological approach represents the quality-state of ‘somebody’ (existence) being aware of ‘something’ (reality). The ‘somebody’ refers to the internal-mental existence/ entity. This mental existence has abstract (artistic, cultural) preoccupations and pleasures, sometimes acting contrary to primary biological needs of the body such as eating or sleeping, in favour of mental goals such as enjoying music or internet gaming (14). In decision-making terms, the internal-mental existence corresponds to that part of the mind having voluntary and selective attention and dealing with the processing of various kinds of selected data; we often practice attention and the processing of data through virtual models (games, mathematics, etc.), taking enjoyment in improving our mental

performances. The ‘something,’ on the other hand, refers rather to the internal/ mental representation of information (colours, sounds, tastes, abstract ideas, etc., which exist only in the mind) (15), which makes up an internal mental reality surrounding and interacting with our mental existence (7, 8).

Just as the physical body exists within an environment where the body interacts with the surrounding physical/ chemical stimuli (an external physical interaction), our mental existence/ entity exists within an internal mental reality that is composed (represented in terms) of internal mental stimuli. This means that, beyond the *external-physical interaction* (between external stimuli and physical body/ receptors), there is within the brain an analogous *internal-mental interaction* (between our mental existence and internal mental stimuli) (7). On the one hand, the internal-mental reality (colors, sounds) might be viewed as a cerebral promoter/ stimulus triggering mental activity, such that the internal-mental reality would impart a sense of a *cause* in the psychological processes of internal-mental interaction (because it initiates mental activation and responses). However, in a physiological approach, colors, sounds, etc. also have an apparent sense of an *effect*, being the internal cerebral consequence/ result generated by action of an external cause/ stimulus. To be able to integrate the two perspectives into a single and coherent approach, it is necessary to clarify if this internal-mental reality (colors, sounds, etc.) would represent a cause (according to psychological perspective) or an effect (according to physiological perspective) within a unitary psycho-physiological mechanism.

The physiological process of receiving external information supposes transmission of this information towards the brain. For example, electromagnetic waves act on eyes and information is thus transmitted to the brain, stimulating primary visual cortex; air pressure acts on the ears and thus information is transmitted to the brain, stimulating primary auditory cortex, and so on. The activation of these primary cortical areas is the internal effect/ result of the physiological process of receiving environmental stimuli, which is induced by action of an external cause/ stimulus. In non-humans, this physiological process of receiving external information probably stops here (being further connected to

motor reflex responses), and implies various kinds of encoding information that are inaccessible and thus unaware to the mind (e.g., the physical format of visual stimuli in the environment is electromagnetic waves, while the physiologic format in the brain is represented by activation of primary visual cortex—the brain has no inherent awareness of these electromagnetic waves) (16).

The human brain goes further and converts information from a physiological format (activation of primary visual/ auditory cortical areas, etc.) to a mental format (in the form of colors, sounds, etc.). The brain of humans performs the genesis of colors, sounds, etc. implying dedicated physiological resources (the secondary cortical areas, neuronal energy/ consumption), but with a well-defined psychological purpose, represented by conversion of information into a format (mental) that is accessible to the mind (17). Entering into conscious domains of the mind, this mental information (colors, sounds, etc.) is able to initiate/ activate mental processes which further trigger mental response/ effect. As a consequence, internal-mental reality (colors, sounds, etc.) is interpreted as the sense of a cause (internal mental stimuli/ internal-mental reality) for the mind, being supported by a dedicated psycho-physiological process that is different from (but interconnected to) the physiological process related to reception of external information (7).

### *3. Internal mental interaction and external physical interaction*

Internal mental interaction and external physical interaction take place independently of each other, being interconnected only partially, through information exchanges. A number of examples can be invoked to illustrate this process: a) Even though the mind has distributive attention, we are not able to pay attention to all informational inputs at once (derived from multiple external stimuli acting simultaneously on our body), particularly when they are numerous (18). b) The impression of contact generated by clothing (touching perception) disappears shortly after getting dressed, due to the process of habituation (19). c) The internal interaction can be channelled through attentional focus on some specific (concrete or abstract) aspects within our mind (the mind can conjure up an image), ignoring

informational inputs that resulted from external interaction (making abstraction of what the eyes see, so that the mental representation of external visual information is lacking). Or, the mind can ignore some objects from the visual field, focussing attention on only one object (20). d) Dream states represent a cogent example of the internal interaction between mental existence and mental reality, with no relation to the external medium/ interaction (21). e) Finally, autism might be viewed as a pathological condition that consists in a deficient transfer (input/ output) of information between internal and external interaction (22). Autistic persons live “in their own world” (internal reality), that is partly disconnected from “external reality”. On the one hand, this disconnection is perceived as a social impairment (23). On the other, autistic persons sometimes exhibit “savant syndrome” (profound and prodigious capacities/ abilities, far in excess to that of unaffected individuals) (24), due perhaps to a facilitation of the internal mental functioning/ interaction (between internal-mental existence and internal-mental reality) through partial exclusion of the external inputs (generated by external interaction/ reality).

With respect to internal mental interaction, our internal-mental reality corresponds to specific (secondary cortical) areas in the brain that transform externally derived information into mental/ conscious data (colours, sounds, etc.). At the other end, our mental existence also has its own delineated structure (hypothalamus) that a) receives information from internal-mental reality (cortex) through attentional focus, b) processes it, and then c) sends it back to the cortex in the form of conclusions/ results (7). Thus, the information circulates bi-directionally between internal-mental existence (hypothalamus) and internal-mental reality (cortex), being encoded perhaps in the frequency of neural impulses. The psycho-physiological difference between this internal-mental interaction (between hypothalamus and cortex) and external-physical interaction (between external stimuli and body) lies in the fact that the first supposes only one physiological stimulus (neural impulses) and “multiple informations” associated with it (encoded in frequency), while external interactions suppose multiple external stimuli and only “one information” associated with each stimulus (a stimulus encoding/ referring to only one physical matter) (7, 8).

#### 4. The "mind-body problem"

In order to facilitate an understanding of the mind and of the existing interrelation between abstract information and the neurobiological support (the mind-body problem), it is first necessary to divide the mind in two distinct psycho-physiological components: internal-mental reality and internal-mental existence. This psycho-physiological delineation does not necessarily imply that internal-mental reality and internal-mental existence should be studied separately. In fact, it would probably be counterproductive to ignore the concept of an internal-mental interaction, and to discuss either our internal-mental existence (that is different by our physical body), or the internal-mental reality (that is different by the surrounding environmental reality) in isolation from one another, due to two important reasons. First, the study of interaction/ compatibility between internal-mental existence and internal-mental reality can highlight some important physiological observations (related to autonomic duality), a concept to be developed in a future article. Second, internal-mental reality is part of the conscious mind, contributing thus to the construction of an internal-mental existence. Why do we make this latter point? Because psychologically, our conscious mind is the mental realm in which our awareness of self and our executive control of the mind exists. And because physiologically, the internal-mental existence sends information about itself to the internal-mental reality, which then is returned back to internal-mental existence, informing it about its/his/her existence/awareness and response (insofar as self-monitoring and control, capacity for auto-maintaining, etc.).

Elaborating on this point with an example, the statement "the brain generates color in secondary visual cortex" is overly-simplistic and therefore counterproductive (studying internal reality = colors = secondary visual cortex, separately by internal mental existence = hypothalamus), because it discourages further critical analysis of an actual underlying process. Specifically, in the secondary visual cortex the brain does not synthesize color pigments (something that would be static); in the secondary visual cortex color is actually represented by generated nervous impulses (with certain characteristics: frequency,

amplitude) which have the significance of a certain color only for another neuronal structure which is able to receive them (e.g., hypothalamus). In other words, our internal mental reality (secondary sensory cortex) has no meaning in the absence of an internal mental existence, and vice versa. *This point has an implication which could help shed light on the mind-body problem.* If our internal reality and internal mental existence/identity (two mental subdomains) depend on each other, then the mind (which incorporates these two subdomains) exists and depends on their interaction/ interrelation. Namely the mind must depend on the brain (neurobiological support), information (neural impulses), and the flow of that information in an ordered manner (providing a temporal dimension and thereby giving mental function a concept of time). This last concept may be key to solving the mind-body problem in that the mind depends not only on a material support (the brain) but also on an immaterial dimension, namely, time. In incorporating an immaterial element, the mind has entered the realm of abstraction, and lays the foundation for abstract perception and thinking, a topic that will be discussed in a future paper.

### *5. Perspectives*

Finally, we want to raise the idea of the phenomenon of ‘integrality’ (how the whole is made up and functions) as an introduction to a forthcoming discussion. A cell has specific cellular functions (division, etc.). Many cells aggregate to form different tissues which further generate complex systems/ organs. These organs perform functions that have no sense of its separate/individual constituent cells. The femoral bone cell intervenes (together with muscles, tendons) in locomotion, the cranial bone cell intervenes (together with meninges) in protection of the brain, the dental bone cell intervenes (together with tongue) in digestion/ mastication. Yet none of the mentioned complex bone functions (which are different) can be attributed to a single bone cell (as a singular/ distinct entity). In other words, the complex function has no sense for (or apparent relation to) its simplistic structure, because the respective simplistic structure contributes only in part to the performing of the respective function.

Returning to the "mind-body problem" also with an example useful for perspective, we can see an object when look at it, and ceases to see it (sees anything else with eyes) when turn the head. In a similar way, our mental entity/ existence can focus attention exclusively towards the head/ conversation with a person, without any interest in respect to his/ her clothes/ shoes color (even if they are present in our visual field). After finishing discussion (the person's departure), we could be unable to describe the clothes/ shoes color (if it was not observed passively, beyond of our attention). In other words, internal mental reality (the shoes color) has no meaning/ doesn't exists in the absence of (attentional focus of) internal mental entity. And the reverse is also true, which means that our mind doesn't exist/ has no meaning in the absence of internal mental interaction. All our mental processes (internal mental existence, internal mental reality, memory, etc.) are dynamic, even if many mental processes are unconscious. This is the reason for which we can disappear total mentally if our brain is not oxygenated/ vascularized for about 10 minutes- due to the fact that many cerebral dynamic processes are no longer supported and disappear.

## **Conclusions**

From a computational perspective, it is unclear how abstract information (intangible/ immaterial, unlimited in respect not only to volume but also to domains) is related to the neurobiological support of the brain. Such abstract information intervenes not only in the decision making process but also in various specific biological functions and responses of the body, thus becoming an important topic for debate and discussion.

But, from a psycho-physiological perspective, in addition to external-physical interaction there is also an analogous internal mental interaction, between internal-mental existence and internal-mental reality. The internal-mental entity is different from the physical body, the internal-mental reality is different from environmental reality, and the mental interaction is also different from physical

interaction. In other words, this model would suggest that there is actually no `mind-body problem`. Rather, there are two distinct and interconnected questions, namely the mind (the `data-brain problem`) and the body-environment interaction (`body-environment problem`). The body-environment problem is physiological in nature, and is relatively well documented. The mind (data-brain problem) is psycho-physiological in nature, and corresponds to a neuro-informational entity.

With respect to the `data-brain problem` (neuro-informational nature of the mind), it is well documented that concrete conscious data (colors, sounds) are supported by the brain, originating in the secondary somatosensory cortex. This means that the mind should incorporate both *conscious* data (colors) and an *unconscious* physical support (brain), the second being currently underestimated.

In the case of the `mind-body problem`, the tendency has been to assign extremely complex functions of the mind (abstract ideas, consciousness, colors) to simplistic physiological structures (neurons, centers, secondary cortex). And we presented that the cerebral support of the mind is actually more complex, incorporating interrelated neuronal structures (that should be not studied separately because their interaction generates the mind) and an immaterial component (the time, which is required for interaction). We are convinced that the things are actually more complex, but, due to limited space and a didactical purpose we presented the things as simple as possible.

## **Disclosure**

The two authors had equal contribution to this article, so that both of them should be considered the first author of the paper.

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