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Chapter 6
Different Ways of Attending to Experience: Formalizing the Phenomenological Epoché to Translate Between Science and Philosophy

Abstract: When we reflect on our experience, our attention shifts from the objects of our experience towards the experience of the objects. This *shift of attention* can be understood in at least the following three ways: (1) an instance of *introspection* where a physical self is attending to its own experience, (2) an instance of *psychological reflection* where a psychological self is attending to its own experience in a phenomenological manner, or (3) an instance of *transcendental-phenomenological reflection* where a transcendental-phenomenological self is attending to its own experience. Misunderstandings of phenomenology often revolve around conflating phenomenological reflection with introspection or understanding it merely as a kind of psychological reflection. Such misunderstandings are detrimental not only to phenomenology alone, but also to the interdisciplinary study of experience insofar as they hinder productive exchange between disciplines. This paper presents a metareflection by a philosopher and a scientist on the nature of reflection understood as a shift of attention. We introduce a new formalism of the phenomenological method of 'bracketing', known as the phenomenological epoché, that will help clarify the aforementioned differences and prevent making logical mistakes that may arise from the ambiguity of the concept of reflection. The formalism delineates a layered model defining structural constraints on the language inherent to each discipline, with physics at the ground level, psychological phenomenology on the level above that, and transcendental phenomenology at the top. Our model, together with the notations we introduce, further illustrates how translations between the disciplines are possible and what kind of precautions one must take when undertaking them. Finally, we discuss potential implications of the model by highlighting important analogies between science and philosophy.

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Introduction

I am sitting in my rocking chair inside my room looking outside at the snow falling on the ground. I then stop and attend to my experience of looking at the snow. This kind of event can occur either spontaneously or be the result of a conscious effort brought about by means of a specific method. Either way, when this happens, I am no longer attending to the snow outside of my window, but I am *reflecting* on my experience of looking at the snow. Reflection can thus be understood as a *shift of attention* from the objects of our experience towards one's own experience of the objects. But depending on what kind of reflection we have in mind, we can end up with very different ways of understanding this shift of attention. The aim of this paper is to clarify some of the ambiguity involved in the discourse on reflection and the kind of change it brings about in our attention. In the above example, the reflection on my experience of looking at the snow can have at least three meanings: (1) an instance of *introspection* where a physical self is attending to its own experience, (2) an instance of *psychological reflection*[1] where a psychological self is attending to its own experience in a phenomenological manner, or (3) an instance of *transcendental-phenomenological reflection* where a transcendental-phenomenological self is attending to its own experience. In the following, we argue that the above three meanings should be clearly distinguished. In order to help clarify the differences, we will introduce a new formalism of the phenomenological method of 'bracketing', known as the phenomenological epoché, in order to avoid logical mistakes that may arise from ambiguity of the term reflection. This will be valuable, not only for phenomenology alone, but also for the interdisciplinary study of experience. The following is a metareflection by a philosopher and a scientist on reflection understood as a shift of attention to create a metalanguage on experience that translates between science and philosophy.

But before we go any further, we must note that in interpreting reflection as involving a shift of attention, we are not thereby suggesting we understand reflection solely in terms of attention, i.e., that we reduce reflection to a form of attention. Phenomenological considerations show that whereas both attention and reflection modify our experience by accentuating and articulating what was only implicitly given, reflection involves a turning back of consciousness

1 'Psychological reflection' here designates *phenomenological*-psychological reflection which is a specific kind of phenomenological reflection and distinct from the kind of reflection empirical psychologists employ. We will say more about this in Section 2. Unless otherwise stated, when we say 'psychological reflection' in this paper, we mean phenomenological-psychological reflection.

onto itself, thereby introducing a new act that is founded on the reflected on experience. As Zahavi writes, following Husserl: "To pay attention to something is not to engage in two processes or activities, but to change or modify one's first-level experience or activity. Reflection, by contrast, is precisely a new (founded) act; it never occurs in isolation, but only together with the act reflected upon." (Zahavi 2005, 90) In this paper, we refrain from delving into the complex discussion regarding the exact relationship between reflection and attention.[2] Instead, we focus on the relatively noncontroversial fact that reflection, albeit a new founded act, involves a shift of attention. Therefore, the main question of this paper is: *What is the nature of the shift of attention involved in phenomenological reflection and how does it differ from that of other sorts of reflection?* Let us begin by introducing the phenomenological method as it was set out by Husserl.

1 Introspection vs. Phenomenological Reflection

In his influential book *Consciousness Explained* (1991) and elsewhere (1987), Daniel Dennett dismisses classical phenomenology on the grounds that its introspective method, or what he calls "introspectionist bit of mental gymnastics" (Dennett 1987, 153), does not qualify as a sound scientific method. Focusing solely on one's own inner mental life, phenomenology is essentially an 'autophenomenology' which, according to Dennett (1987, 153), by no means can yield interesting scientific results.[3] One way of saving phenomenology from such criticism is by saying that such introspective reports can still be used in psychology as specific points of data.[4] Indeed, one could even try to argue, as some have done (Gutland 2018), that phenomenological reflection is a refined form of introspection that is more scientific and systematic. But rather than trying to define phenomenological reflection in terms of introspection, we will take a more traditional approach below of trying to clarify their differences.

To begin with, phenomenology is not interested in what is going on inside the mind of a particular person at a particular point in time. This is because,

2 For a closer examination on this topic, see Breyer (forthcoming), Depraz (1999) and Depraz et al. (2003). Depraz et al. (2003, 24ff.) present a three phased model of the phenomenological epoché (which is a key component of phenomenological reflection) whereby attention plays a twofold function.

3 We will not be engaging with Dennett's arguments in any detail here. For a strong case against his account of phenomenology, cf. Zahavi (2007).

4 Cf. section 3: "The Role of Introspection in Scientific Psychology" of Schwitzgebel (2019).

first and foremost, phenomenology is the study of the ways in which things show themselves in our experiences and their invariant structures. It is not interested in particular mental episodes, but in understanding the essential structures of our experiences. But you may wonder how one can undertake such study without observing what is going on inside one's mind. After all, where do things show themselves but in our mind? This is where phenomenology proves its novelty: it does not buy the distinction between the 'inner mind' and 'outer reality'. But this is not to say that it denies it either. Rather, phenomenological reflection begins by acknowledging that we usually operate with this distinction. We naturally believe that the world is out there existing separately from us and that our experiences of the world take place somewhere inside our mind. Husserl (1983, §27) calls this 'the natural attitude'. But instead of remaining in this natural attitude and maintaining the distinction between the 'inner mind' and 'outer reality' as a legitimate starting point, phenomenology sets it aside. This procedure is called the *phenomenological epoché*. 'Epoché' in ancient Greek means to suspend judgment so the phenomenological epoché is the method of suspending judgment about the existence of objects and the world, which characterizes the natural attitude. To use Husserl's expressions, it is a way of 'bracketing' or 'putting out of play' our belief in the existence of objects and the world (Husserl 1983, §§30–32). And since our belief in the existence of the world is often coupled with the belief that the world is 'out there' and our mind 'in here', to suspend judgment about the existence of the world effectively means to suspend judgment on the distinction between 'outer reality' and 'inner mind'.

Before we go any further, let us stop here and clarify a typical misunderstanding of this epoché, which results in a further misunderstanding of the subject matter of phenomenology. The epoché is *not* a method of denying, negating, doubting, or even excluding the world and its existence. If it were the case, then phenomenology would deal exclusively with our experience and leave the world out of the picture. This kind of interpretation would make phenomenology susceptible to the kind of criticism Dennett and others raise. But the phenomenological epoché does none of that. Instead, it is a method of suspending our judgment about the existence of the world, which is to assume a very specific attitude (and quite an unnatural one indeed) where you neither believe nor disbelieve that the world exists. Far from leaving the world out of the picture, this method in fact allows us to see more clearly our relation to the world that was otherwise covered up in the natural attitude due to the various beliefs and theories attached to the general belief in the existence of the world. It opens us up to 'phenomena', or the ways in which things present themselves in our experience. This is what the *phenomenological reduction* accomplishes. 'Reduction' here does

not mean to diminish in size, but from the meaning of the Latin word '*reducere*' (to lead back), it means that, upon the execution of the epoché, we are led back to the phenomena themselves *purely* in the way they present themselves to us. The word 'purely' is important here. No longer do we believe that these phenomena belong to the mind or that they are the result of what happens in the brain.[5] When we bracket our belief in the existence of objects and the world, we are also bracketing all beliefs and theories that are based on this universal belief. As a result of this bracketing, we are freed from the inner realm and disclosed to the field of phenomena.

Therefore, phenomenological reflection (consisting of the phenomenological epoché and reduction) is not a bending back of consciousness onto itself understood separately from the world. Rather, it involves *a change of attitude*, or a shift of attention,[6] from straightforwardly relating to objects (through our perception, imagination, thinking, etc.), to taking up a *reflective* attitude where we are attending to objects *as they relate to our experience of it*. Put differently, phenomenological reflection allows us to move away from the natural attitude to the *phenomenological attitude*; it transforms the everyday experience of being involved with objects into *phenomenological experience*, the field of experience having an intentional structure consisting of what phenomenologist call a *noetic* component (the act) and a *noematic* component (the objective correlate of the act). Husserl (1970, §46) calls this the "universal a priori correlation" between the *cogito* and the *cogitatum*. On the side of the *cogitatum*, phenomenologists work with the descriptions of the intentional object as it is intended, and these are called the noematic descriptions. On the other side of the *cogito*, we have the descriptions of the mode of consciousness, i.e., the noetic descriptions.

At this point, let us return to the example we raised in the introduction to see where our observations so far have brought us. In the example, I was sitting inside looking outside at the snow. I then reflected on this experience and said, 'I am looking at the snow'. Let us say this person is a phenomenologist. What

5 There is in fact another sense in which the phenomena in question are 'pure'. Once we employ the eidetic reduction through what Husserl calls the free variation in imagination, the phenomena become purified from particularities as well. Although the eidetic reduction as well as the intersubjective reduction (reduction to pure intersubjectivity) are both important components of the phenomenological method, for the purposes of this paper, we are mainly focusing on the phenomenological epoché and reduction.

6 Speaking in terms of attention rather than attitude may be more appropriate since, following Heidegger's criticism towards Husserl, our natural manner of experience is not one of taking up an attitude. When one straightforwardly relates to objects, we are not taking up any position towards those objects (which is implied in taking up an attitude), but we are attending to them (Heidegger 1985, §12).

change in attention did the phenomenological reflection bring about in our experience? Before the phenomenologist reflected on her experience, she was practically engaged with her surroundings. She may have been enjoying the peaceful scenery of the snow quietly falling to the ground. She may also have been enjoying herself in the warm room having a cup of tea with the view to the falling snow. In any case, before reflecting on this experience, there was no question that the snow that she is seeing outside the window really exists; it was merely assumed. Her own existence, namely the existence of the person that is currently sitting in the rocking chair with a specific personal history, was also taken for granted. Moreover, when we are practically engaged with our surroundings, not only do we assume the existence of the world and everything in it (including myself), but we are also *attending* to them and not our experience of them. So while I am enjoying the snow, I am attending to the snow and *not* to my experience of the snow.

But all of this changes when she decides to take up the phenomenological attitude.[7] She will first bracket her belief in the existence of the world (recall that this is the phenomenological epoché). She now abstains from believing that the snow that she is seeing is the physical snow which exists in the outside reality. This does not mean, however, that she stops looking at it or that she has denied its physical existence. Rather, she has suspended judgment about the existential status of the snow and is now purely attending to the ways in which the snow is being presented to her in her experience. Now, is this experience something that is happening in the mind? No. When she brackets her belief in the existence of the world, as we said earlier, she is effectively bracketing her belief in the distinction between the 'inner mind' and 'outer reality'. So when she attends to her experience of looking at the snow, it is not as if her attention has shifted from what is going outside to what is going on inside. In other words, it is not as if she stopped focusing on what is going on in the physical realm and instead turned her focus to what is going on inside the psychical realm. Rather, once she has bracketed the existence of the world, her attentions shifts to the experience of looking at the snow *just in the way it presents itself to her* (this is the phenomenological reduction). *This* experience is what we mean by 'phenomenological experience'. She will be surprised to discover so much

7 Here we are presenting an example of how one might deliberately go about bracketing and executing the phenomenological reduction. However, it should be noted that there is an important sense in which one initially passively falls into the epoché, where the world becomes one big question mark. In his insightful article, William Jon Lenkowski (1978) has argued that the epoché presupposes the "fall into perplexity" where the world slips away, which is an event that happens to us and not something we deliberately bring about.

about this seemingly simple experience of looking at the snow. She will discover that the falling snowflake as it is perceived is always appearing to her from a specific profile while she is nonetheless somehow intending the whole snowflake. She will also discover that as she perceives the snow, there is an outer horizon that is co-given to her, such as the sound of the crackling wood in the fireplace or her childhood memory of playing in the snow. She may also discover that her perception of the snow comes with a tacit proprioceptive awareness of her bodily self, a sense of how she would be able to walk around on the snow, for example. All of this and much more will be discovered about this phenomenological experience as long as she is employing phenomenological reflection and living in the phenomenological attitude.

2 Phenomenological Psychology vs. Transcendental Phenomenology

Before we move on to the next section, we still need to clarify an important distinction that pertains to phenomenological experience. So far, we have not said anything about what kind of purpose one may have in doing phenomenology. What does the phenomenologist ultimately attempt to accomplish from studying phenomenological experiences? As a matter of fact, depending on the purpose and, accordingly, how one attends to the experience, phenomenological experience can take on different meanings. Husserl himself envisioned two ways in which one may undertake phenomenological investigations. One way is called *phenomenological psychology* (also called psychological phenomenology) and the other, *transcendental phenomenology*.[8] Phenomenological psychology is an a priori psychological discipline that studies our mind in a phenomenological manner. Just as a priori physics, such as geometry or mechanics that study the essential structures of physics, provides the foundation for the empirical natural sciences, phenomenological psychology is said to be the a priori psychology that is necessary for securing the grounds for empirical psychology. As Husserl says: "Phenomenological or pure psychology as an intrinsically primary and completely self-contained psychological discipline, which is also sharply separated from natural science, is, for very fundamental reasons,

8 The following discussion of this distinction is based on one of the author's previous works (Ishihara 2016, 33–39).

not to be established as an empirical science but rather as a purely rational ('*a priori*,' 'eidetic') science." (Husserl 1997, 92)[9]

But phenomenology's role is not exhausted as an a priori psychological discipline nor does this capture the radicalness and true significance of phenomenology. This is because psychological phenomenology is not yet transcendental phenomenology and, according to Husserl, it is only as the latter that phenomenology establishes its unprecedented role in the history of philosophy. As Husserl says:

> The new phenomenology did not originally arise as pure psychology and thus was not born of a concern for establishing a radically scientific psychology; rather, it arose as '*transcendental phenomenology*' with the purpose of reforming philosophy into a strict science. Because transcendental and psychological phenomenology have fundamentally different meanings, they must be kept most rigorously distinct. (Husserl 1997, 95)

What Husserl means by the two sciences having different meanings is that they serve different purposes. The aim of psychological phenomenology is to articulate the invariant structures of our mind and, hence, is "born of a concern for establishing a radically scientific psychology". As we said above, psychological phenomenology provides the foundation for empirical psychology and thus secures the scientific rigor of psychology. Transcendental phenomenology, on the other hand, has a specifically philosophical aim of "reforming philosophy into a strict science" by articulating the meaning and validity of the world as it is constituted by the functions of consciousness. The difference can also be cashed out in terms of their scope: the transcendental problematic is much broader since its concern is not limited to a specific region, i.e., the mind, but rather extends to all possible regions. And in that sense, transcendental phenomenology is an a priori science that provides the foundation for *all* sciences, not just psychology.

Despite these differences, however, Husserl believed that the two sciences, psychological phenomenology and transcendental phenomenology, are like

9 It should be noted that Husserl's use of 'a priori' does not coincide with that of Kant which is opposed to the 'a posteriori'. As he does in the quote, Husserl often used 'a priori' interchangeably with 'eidetic'; phenomenology is an 'a priori' or eidetic science (cf. Husserl 1983, xxii). Since essences, according to Husserl, are not inferred either inductively or deductively by the intellect, but directly intuited in our experience, 'a priori' and 'eidetic' are not opposed to 'a posteriori'. Understandably, he states elsewhere that he would avoid using 'a priori' and 'a posteriori' as much as possible to avoid confusion: "As already was the case in the *Logische Untersuchungen*, I avoid as much as possible the expressions 'a priori' and 'a posteriori' because of the confusing obscurities and many significations clinging to them in general use, and also because of the notorious philosophical doctrines that, as an evil heritage from the past, are combined with them." (Husserl 1983, xxii)

sisters. As he says: "[O]ne science turns into the other through a mere change in focus, such that the 'same' phenomena and eidetic insights occur in both sciences" (Husserl 1997, 95–96). And therefore, he further claims that "in a certain way purely psychological phenomenology coincides with transcendental phenomenology, proposition for proposition" (Husserl 1997, 98). Yet, this is not without an important qualification. The 'change in focus', or to use our preferred phrase, the *shift of attention*, has the effect of changing the meaning of their results fundamentally. This is to say that, while the psychologist and the transcendental phenomenologist share their findings on the intentional structure of consciousness, their *interpretations* of these insights differ substantially such that they end up with completely different understandings of the phenomenological realm that is uncovered. But how can their interpretations differ so radically? What does this 'change in focus' consist of?

It is here that we are introduced to the method called the *transcendental reduction*:

> The objectives of a transcendental philosophy require a broadened and fully universal phenomenological reduction (the transcendental reduction) that does justice to the universality of the problem and practices an 'epoché' regarding the whole world of experience and regarding all the positive cognition and sciences that rest on it, transforming them all into phenomena – transcendental phenomena. (Husserl 1997, 97)

What is interesting here is that the transcendental reduction is introduced as "the broadened and fully universal phenomenological reduction", thereby suggesting that the transcendental reduction is an extension of the phenomenological reduction and not something radically different. Indeed, this is why the phenomenological psychologist can become a transcendental phenomenologist by executing what Husserl (1997, 128) calls the "unconditioned epoché". Or, put the other way around, the transcendental phenomenologist can become a phenomenological psychologist by abstaining from taking this "unconditioned epoché" and thereby remaining transcendentally naive. But the question remains: Have we not already bracketed, through the phenomenological epoché, "the whole world of experience" and "all the positive cognition and sciences that rest on it"? In other words: *what more is there to bracket?*

Without going into too much detail, it will suffice here to say that Husserl seemed to believe that insofar as the phenomenological psychologists are interested in studying the structures of the mind, they are maintaining the existence of the mind and are effectively presupposing the existence of the world since the mind is part of a psychophysical being that exists in the world. In short, contrary to appearances, the phenomenological psychologist remains in the natural attitude. Husserl says: "Even pure psychology in the phenomenological sense,

thematically delimited by the psychological-phenomenological reduction, still is and always will be a positive science: it has the world as its pre-given foundation" (Husserl 1997, 96–97). What Husserl means by "positive science" here corresponds to any science that deals with entities whose existence is posited, i.e., presupposed. Phenomenological psychology is a positive science in this sense because, whilst initially bracketing the existence of the world, the mind itself is nonetheless presupposed as existing in the world. Therefore, in order to execute the "unconditioned epoché," we have to bracket that which was left unbracketed by the phenomenological psychologist, namely the existence of the mind. What we then have as a consequence is not the mind posited as existing in the world, but a consciousness purified from all existence. Husserl calls this transcendental consciousness (or ego).[10]

Yet, here again, we should be careful not to misunderstand what the epoché achieves. To bracket the existence of both the world and the mind does not mean that we get rid of them. Rather, it means that we can now study the intentional structures of our experience independently of all beliefs and disciplines that presuppose the existence of the world or the mind. Transcendental phenomenology is therefore no longer a psychological discipline, but a philosophical discipline characterized by a higher-order reflection that seeks to understand how the meaning and validity of objects and the world are constituted in our experience based solely on the ways in which they are given to us in our experience. Borrowing Kantian terms, we can say that transcendental phenomenology is interested in disclosing the conditions of possibility of the meaning and validity of objects and the world.[11]

Let us sum up. We have said that the transcendental phenomenologist differs from the phenomenological psychologist in that, while they both attend to

10 This may sound like there are two egos: the empirical ego (or the mind or human subject) that exists within the world (and hence is an object among other objects) and the transcendental ego that does not exist in the world but is the condition of possibility for objects and the world. Husserl (1970, §53) called this the "paradox of human subjectivity": being a subject for the world and at the same time an object in the world. Following his way of dealing with the "paradox", we can say that it is not that there are two egos, but that they are two ways of attending to or apprehending ourselves. Namely, one and the same subject can be understood as the empirical ego or the transcendental ego depending on the kind of reflection one employs (reflection in the natural attitude or transcendental reflection).

11 One may wonder how Husserl's transcendental phenomenology differs from Kant's transcendental philosophy. While a detailed explanation requires much more space, we can very briefly describe the most important difference in the following: Kant's transcendental inquiry begins with the fact of certain scientific knowledge and moves on, in a regressive way, to the a priori subjective conditions that make such knowledge possible. Husserl did not contest this regressive method in itself (though he did not limit transcendental inquiry to scientific

our experience in a phenomenological manner, the latter remains in the natural attitude insofar as she takes the mind to be existing in the world. In order to move to the transcendental attitude, one must put into effect the "unconditioned epoché", which brackets all existence including the existence of the mind. This in turn brings us back to *transcendental-phenomenological experience*. (Here, in order to properly distinguish the method that separates transcendental phenomenology from psychological phenomenology, we can call the bracketing of *all* existence and the return to transcendental experience, 'transcendental epoché' and 'transcendental reduction' respectively.) Accordingly, attending to one's experience in a phenomenological manner can have the following two meanings: (1) attending to the intentional structures of our experience, which belongs to the mind (*psychological-phenomenological reflection*), or (2) attending to the intentional structures of our experience just in the way they present themselves to us, without any regard as to *where* this experience may be or *what* they may be apart from how they appear to us (*transcendental-phenomenological reflection*).

3 Disciplinary Layers

The above exposition has prepared the grounds for us to finally introduce the formalism of the 'bracketing' that we have promised. Any formalizing requires abstraction. So let us take a step back and make a few observations that would lead us to our formalism.

Nature arranges itself in a series of organizational levels, from its atoms near the bottom, to the biosphere near the top. The identification of such layered structure is omnipresent in philosophy and natural sciences, from the

knowledge or cognition but expanded it to our experience in general), but he did find it problematic that Kant did not have a way of providing sufficient evidence for the transcendental conditions. In other words, Kant sought the conditions of possibility for our cognition through transcendental arguments that bear no direct, intuitive evidence. This is why Husserl (1970, 115–116) called Kant's transcendental method "a mythically, constructively inferring [*schliessende*] method" and claimed that if he had not been bound to the naturalistic psychology of his time and had allowed himself to seek the proper intuitive method, then Kant would have discovered "a thoroughly intuitively disclosing [*erschliessende*] method, intuitive in its point of departure and in everything it discloses". To be sure, with the latter, Husserl is alluding to his own phenomenological method. Therefore, the main difference between their transcendental methods lies in Husserl's insistence on the phenomenological method and specifically, its appeal to intuitive evidence.

"layer-cake" (Oppenheim and Putnam 1958), to "levels of mechanisms" (Craver and Bechtel 2007), to the multilevel selection theory of cooperation in biology (Wilson and Wilson 2008). The reality of the world as captured by our senses also appears to divide itself into similar layers of organization. We can identify some of these layers in our example where I was sitting in my chair looking outside at the snow, and then, upon reflection, a change of events occurred where I was no longer attending to the snow itself, but to my own experience of it. There is, first of all, the existence of physical objects, like the chair and the snow, which constitute a layer. In our practical lives, we are involved with these objects in one way or another: I am *sitting in* the chair, *looking at* the snow. These experiences of the objects constitute another layer. But we can further identify yet another layer, which is the layer of reflection that allows us to distinguish our own experiences from the objects that are experienced.

In our approach, we propose that each layer should correspond to its own discipline of study, and thus be described by a particular language and structured by particular logical rules describing which relations are possible or not. In Figure 6.1, we show a matrix representing the three layers involved in the study of our experience, as well as its major studied entities. Each row corresponds to a discipline of study in the sciences or philosophy (physics, phenomenological psychology, and transcendental phenomenology), and each column is an entity (object, experience, and reflection). We will refer to this matrix as *the experience levels matrix*, or simply, the matrix. It should be noted, however, that the three layers we are introducing are by no means exhaustive of the levels of our experience. We can break down the levels into more, or more specific, categories, which would have their corresponding disciplines. However, we have limited ourselves to these three layers for the purpose of distinguishing the different kinds of reflection and the changes they bring about, and, more specifically, to clarify some of the misunderstandings and ambiguities surrounding phenomenological reflection.

We define the matrix of experience levels, as shown in Figure 6.1. To construct this matrix, we make use of a pseudo-mathematical notation, which is meant to clarify the relations among all entities (i.e., columns), when referred to in each of the languages corresponding to each layer (i.e., row). This notation allows us to write expressions referring to phenomena in a given layer, i.e., entities within the language of a discipline. An o refers to the object of an experience, whereas an x symbolizes a (subjective) experience, which can be either an experience of an object, or an experience of another experience (reflection). We introduce the notation $\circ$ to represent the composition of an experience with its object. This should be considered together with the experience, as an operator on an object o, denoted $x\circ$. From there, $x\circ o$ denotes the experience x of an object o. We

also introduce the notation *[]* for the bracketing understood in the phenomenological sense of the epoché. A bracketed expression indicates the suspension of judgment over the existence of the enclosed entity. For example, *[o]* with brackets in the expression *x∘[o]* indicates that the existence of the object of experience *x* is neither assumed to exist nor assumed not to exist. Lastly, we use the apostrophe such as in *x'∘[o]* instead of *x∘[o]*, to express that experience *x'* is distinct from experience *x*. Note that all these conventions are meant to form a helpful notation and not as a fully-fledged mathematical theory.

	Object	Experience	Reflection
Physics	**o** Physical object	**x∘o** Mental state	**x∘x∘o** Introspection
Phenomenological psychology	**[o]** Object as it is intended	**x'∘[o]** Phenomenological experience	**x'∘x'∘[o]** Phenomenological reflection
Transcendental phenomenology	**[o]** Object as it is intended	**[x']∘[o]** Pure phenomenological experience	**x"∘[x']∘[o]** Transcendental-phenomenological reflection

Figure 6.1: Experience levels matrix.
This diagram represents the matrix of levels of experience. It is structured to display a level of experience in each row, corresponding to disciplines of study, and an object of study in each column, corresponding to the studied entities: the object of an experience, the experience itself, and the reflection on the experience.

The matrix is constructed so the elements that lie on the main diagonal – from the top left to the bottom right, indicated with greyed cells in Figure 6.1, for which the index of the row equals the index of the column – are representative of the respective discipline in the sense that they are studied primarily by that discipline. Physical objects are studied primarily by physics, phenomenological experience (that has just bracketed the *o*) is studied by phenomenological psychology, and while what is studied in transcendental phenomenology is phenomenological experience purified of all existence (hence the name '*pure* phenomenological experience'), transcendental-phenomenological reflection is nonetheless representative of transcendental phenomenology in the sense that this is the unique place where the element is studied. These diagonal elements allow us to construct the rest of the matrix, as the rest of the elements

of each row naturally follow from them, as will be explained later, when each layer is detailed.

The most important feature in the matrix is the function of bracketing. Bracketing accomplishes the move from one diagonal element to the next one, and more generally, from one layer to another. Importantly, each of these moves, which is accompanied by a shift of attention, is not a move within a given field of study, but is a jump operating a translation from one discipline to another, which should therefore not be treated lightly. This also means that the shift of attention, when rightly understood, leads to different disciplines. To move from the study of physical objects to the study of experiences, understood in the phenomenological sense, one brackets the existence of physical objects, leading to the middle element of the diagonal, at the center of the matrix. This bracketing of the physical object allows the phenomenologist to attend to and study the object, not as a physical object, but just as it is intended. This is the kind of move any phenomenologist would make. However, when the experience in question is understood as belonging to a mind that exists in the world, then, as we said in the previous section, this would be to stay within the realm of phenomenological psychology. Phenomenological psychologists attend to and study the intentional structures of our experience for their own sake, independently of what physicists have to say about the physical world. And as psychologists, they maintain the existence of the mind, embedded firmly against the backdrop of the world. But while their aim is to establish the foundation for empirical psychology, transcendental phenomenology has a much more ambitious, and specifically philosophical, aim of establishing the foundation for all sciences. As such, transcendental phenomenology must further bracket the existence of the mind to secure the field proper to transcendental phenomenology, rid of all presuppositions deriving from our belief in the existence of the mind and the world. This is how the move from the middle layer to the bottom layer is achieved. It should be noted that although in Figure 6.1, the bracketing of the existence of the mind corresponds to bracketing the existence of the experience *[x']*, it is more precise to say that what we are bracketing here is the existence of the mind (to which the experience is thought to belong) and not so much the existence of the experience *per se*.

With the main element fixed in each layer, we infer the other elements on the line, depending on their respective column. We start from the physical world layer, on the top row of the matrix. This layer corresponds to the discipline of physics, whose language deals with the description of the relations between physical objects, as they can be observed by subjects in the world. A physical object *o* can be observed by a certain subject, making for a subjective experience. Within the physical layer, we refer to such phenomenon as a mental state, studied in

physical terms and which we denote $x \circ o$. When one refers to the experience of reflecting on an experience, we denote this as $x \circ x \circ o$ and refer to such phenomenon as introspection. As we are using a language describing physical phenomena, *all* references to an experience x are physical mental states, which could mean, for example, complete brain states at a given time. Note that in $x \circ x \circ o$, the reflection on experience and the experience of reflection are both denoted by x, the experience in the physical layer, or a mental state. This expression remains in the same language describing physical phenomena, and by no means is a metalanguage of a higher-order description. Therefore, we define introspection as a one-layered concept, where all elements pertain to the language of physics.[12]

The middle layer corresponds to the discipline of phenomenological psychology. The physical mental state $x \circ o$ corresponds to a subject experiencing a physical object o. But since we bracket the existence of the object when moving to the level of phenomenological psychology, at this layer, $x \circ o$ translates to a subject experiencing a bracketed object, i.e., the object as it is intended. Moreover, since the resulting experience is the phenomenologically reduced (in the technical sense of the phenomenological reduction as the method of 'going back') experience that now has the object as it is intended, rather than the physical object, as its correlate, we denote the experience in the middle layer as x' and distinguish it from the x of the physical layer. We note that this distinction is crucial for a careful translation between the layers and has the effect of safeguarding with respect to the x, which may or may not correspond to the same operation as the previous x. For example, the phenomenological experience of looking at the snow may not be equivalent to the physical mental state of the subject looking at the snow. It may well be, but it may not. This is something that a good phenomenologist would not take a stance on since to say that a phenomenological experience just is a physical mental state would be to assume a metaphysical position about the nature of our experience, which is something beyond what phenomenology claims to do. In our notation, we have followed the phenomenologists and made sure to distinguish x and x'. Therefore, phenomenological experience is denoted as $x' \circ [o]$ and phenomenological reflection, $x' \circ x' \circ [o]$.

The last layer, at the bottom of the matrix, corresponds to transcendental phenomenology. This layer is constructed by bracketing the existence of the mind to

12 Physics is here intended in the broad sense, as the discipline of science studying the nature and properties of matter, its motion and behavior through space and time. We consider that empirical psychology – which defines concepts such as introspection – is part of physics taken in this broad sense, concerned with observable physical phenomena relating to mental states and human behavior.

which it was presupposed the experience belongs. This means that we translate phenomenological experience *x'∘[o]* in the middle layer to *[x']∘[o]* (which in Figure 6.1 we have called 'pure phenomenological experience' to designate that this experience is 'pure' of all existential commitments) and phenomenological reflection *x'∘x'∘[o]* to the corresponding concept *x'∘[x']∘[o]* in transcendental phenomenology, naturally referred to as transcendental-phenomenological reflection. However, just as the phenomenologically reduced experience *x'* had to be distinguished from *x*, i.e., the experience understood in the physical layer, here too, we must be careful to distinguish the transcendentally reduced experience from the phenomenological experience of the middle layer. Put differently, since transcendental-phenomenological reflection is freed from the belief that experience belongs to the mind (which exists in the world), we need to carefully distinguish *this* experience from the experience in the middle layer. Therefore, we distinguish *x'* from *x''* and rename the expression to *x''∘[x']∘[o]*.[13]

One may note that this operation is repeatable beyond these three layers, as it is perfectly possible to create additional layers which could be relevant to more disciplines of study. As we said earlier, however, we have limited our scope to these three layers for the purpose of presenting a methodology of comparative study and clarification of the process of translation between fields related to the phenomenological study of experience. One can also note that in general, when one moves down a layer in the matrix, the preserved elements are bracketed, and the newly created elements are indicated with a prime symbol (e.g., *x* becomes *x'*). This notation is helpful in keeping track of which structures are preserved from the other layers and which are unique to the new layer, thereby enabling a smooth translation between the layers.

13 It should be noted that even though we bracketed the *x* and the *o* separately in our notation for the kind of experience transcendental phenomenology deals with (*[x']∘[o]*), we can also bracket them together (*[x'∘o]*). We opted for the separate bracket notation because, as we explained in Section 2, one can move to transcendental phenomenology by way of going through phenomenological psychology. In other words, a phenomenological psychologist could become a transcendental phenomenologist by further bracketing the *o*, which she had left unbracketed (this move is what Husserl called the "unconditioned epoché"). However, a transcendental phenomenologist, having a strong transcendental interest, could bracket the existence of both the mind *x* and the world *o* at once if she wanted to. In this sense, in our matrix, it is not necessary for one to go through the middle layer to get to the bottom one, though transcendental phenomenology always contains within it the possibility of becoming a psychological discipline. Furthermore, whether bracketed separately or together should make no substantial difference in terms of what the transcendental experience would offer.

4 Discussion

Let us now make a few observations based on analogies from the natural language as well as the languages of mathematics and computer science.

Every time we bracket an entity in a translation between layers, we create what a programmer may choose to call a *virtual variable* in the new layer. This signals that this newly created entity no longer answers to the same rules as the previous entity, but does keep some of its characteristics. The virtual variable ultimately lives within the logical rules of the new layer, which are distinct from those of the original layer where its existence was well defined This allows one to now look at the variable independently of the discipline to which it originally pertains.

We can also observe that this process of virtualization is reminiscent of what the practice of quoting achieves. Indeed, Søren Overgaard compares bracketing to the practice of quoting:

> By writing, Karen said: 'Snow is white' I have asserted that someone said something about the colour of snow. I have not asserted anything about the colour of snow. I have neither affirmed nor denied that snow is white, nor have I surmised, questioned, or doubted anything about the colour of snow. One may of course quote something in order to show its truth, falsity, and so on, but the point is that, in and of itself, to quote is to do none of these things. Furthermore, in order to produce an accurate quote you must focus on faithfully recounting *what the person said*, as opposed to what you might know or believe about the subject matter the person spoke about. (Overgaard 2015, 191)

Bracketing is a similar process of preserving what the experience 'says', while refraining from making any judgment regarding the various commitments made within the quoted experience. In this way, phenomenologists are "impartial reporters of our own experience" (Overgaard 2015, 191) or what Husserl calls "disinterested spectators" (1970, §45, §69). Similarly, in the translation that we perform to switch between layers in the matrix, the bracketing's virtualization preserves the reference to the corresponding element in the original layer, while freeing it from the constraints of its own layer. This operation is necessary because the language proper to a layer may imply different structural relationships from another layer, which after the translation may otherwise be subject to misinterpretation. When we bracket the existence of objects in the middle layer, for example, this gives us the freedom to investigate the object just in the way it appears to us in our experience, regardless of whether the object really exists or not.

Mathematical notations often serve as connectors between disciplinary fields, helping to expand and better translate between known theories. We may see the operation of translating from one layer to another as a *change of variables*

in mathematics, a technique used to reformulate problems in which the original variables are substituted for a combination of new variables. The intent is typically that when expressed in terms of new variables, the problem may become simpler for certain purposes, or sometimes become similar to some better understood problem. The problems connected to the structures of experience are highly interdisciplinary, and similarly lend themselves to such reformulations in various disciplines of study. Since each discipline has different goals, and has developed a specific language to help address them, the hope is that the translation exercise may therefore help 'solve' the problem of experience, by taking advantage of specific disciplines offering the tools to solve specific aspects of the problem.

In the formalism we introduced above, we renamed certain notions from one layer (or row) to the other (e.g., from *x* to *x'*), and used bracketing for others (e.g., *[o]*). Both these changes add (and may even remove some) degrees of freedom to the way the notion may be handled in the other layer. While the first adds the possibility for the variable to be non-identical in the new layer's framing, the latter adds the possibility of the notion to either exist or not exist. We note that our notation deceivingly presents the phenomenological epoché and reduction as two distinct operations. However, the phenomenological epoché and reduction, which together allow for a translation from the physical layer to the phenomenological psychology layer, are one and the same operation, like two faces of the same coin. (And likewise for the transcendental epoché and reduction, which together allow for a translation from the phenomenological psychology layer to the transcendental phenomenology layer.) It would be ideal to find a notation that elegantly unifies both operations, the epoché and reduction, although we find this to be a minor caveat that should not restrict its clarifying power.

We note another mathematical analogy. Above, we chose to name our diagram a matrix, in reference to the mathematical object that contains elements from a defined set, on which a set of operations is possible, typically addition and multiplication. More generally, in mathematics, a matrix is defined over a mathematical field of elements, on which two operations are defined – not necessarily addition and multiplication as we know them, although they are typical examples if the set elements are rational numbers – and a series of properties called field axioms must be respected. One possible way of defining the field in our case can be done by considering a set of elements with the following operations: 'experience of' (which allows, for example, to move horizontally from the physical object of an experience to the mental state connected to its experience) and 'translated into the adjacent layer' (which allows, for example, to move vertically from a mental state to a phenomenological experience). We remark that the

matricial notation may suggest the existence of more similarities with the mathematical object, although our intention was originally to clarify concepts between fields of study. It may be interesting to push the metaphor further to explore the fruits it may bear, in terms of new connections, relations, or conjectures the intersecting of experiential sciences with mathematics may reveal. The development of such conjectures is beyond the scope of this paper, but we intend to explore them further in the future.

Moving on from mathematics to computer science, we observe that the structure of the Internet may offer a complementary perspective to this model. In the context of computer networks, the so-called Open Systems Interconnection (OSI) model (cf. Figure 6.2) characterizes all communications that occur, from the moment an individual sends the message 'Hello!' via an application on their smartphone, to the moment it reaches its destination on another smartphone. Both the source and the destination are able to read the message in English. In between, however, the message will be *encapsulated* and *decapsulated*, at least partially, several times, in the process of translation into the language or protocol proper to each layer (e.g., the application layer uses a protocol called HTTP, while the transport layer uses TCP). At each step downwards, before reaching the next layer, the message is being quoted so to speak, by adding keywords around it such that it can be preserved in the underlying layer. This is done from the top layer in Figure 6.2, which corresponds to the level of a message written in English on a smartphone application, all the way down to the physical layer, which consists of signals exchanged in binary over electrical wires and wireless networks. Each step upwards then decapsulates the message by removing the headers and trailers that surround it, thus effectively translating it back to the language of the layer above, until it is back to the English language. This computational view of a layered model with multiple interfaces of translation is similar to the one we have brought up in this paper in the context of the study of experiences. Here too, we can see a comparable operation to the bracketing, preserving a message in a different layer, which relies on a distinct set of logical rules, mechanisms, and specific language. And here too, we can see the importance of a careful distinction between the literal and the bracketed messages not being actionable using their original rules outside the context of their original layer, but nevertheless being usable by the virtue of the bracketing and clearly distinguishing functions between layers.

This computational perspective also highlights the importance of studying the transfer of information while describing the relation between elements involved in subjective experience. Information not only lives in the metalanguage – the language one layer downstream in the matrix – but also directly affects the layer itself. This is also true for the physical layer, where information

is already instantiated and can influence the dynamics of physical systems (Deutsch 2013). When looking at transfers between layers, one notices similar effects where the same information is being reframed and takes on a new interpretation. For example, let us consider two models describing the dynamics of liquid water, the first one based on the behavior of its molecules, and the second in terms of equations of fluid mechanics. While it is possible to transfer the information from one level of description to the other, the variables considered in the first model (e.g., position, velocity, and angular velocity of each molecule) will be drastically different from the second (e.g., viscosity, temperature, and pressure of the fluid). In every layer, the key to understanding the emergent rules resides in reconstituting the complete picture where each part of the system has access to appropriate information in its own context (Wiener 1961). It is therefore crucial to keep track of which bits of information are preserved or modified through translations between layers. One possible application is that by doing so, one may learn about computational complexity constraints involved in moving through a series of embedded layers (Lloyd 2012), which may in turn be more informative than proofs of uncomputability (Aaronson 2012). An advantage of such information perspective is in the way it can capture contingencies between elements of different layers.

This type of computational model is based on a series of consecutive layers building step by step to different perspectives. Each layer corresponds to a different level of description that forms a complete model of reality. From a layer, one may move directly to a neighboring layer, using a well-defined translation process on the elements and operators of the layer's language, to the neighboring layer's homologues. In order to move to a more remote layer, it is necessary to successively compose such translations together, back to back.

Depending on how such neighbor-to-neighbor translations are defined, any intrinsic constraint raised at any layer of the hierarchy, will automatically bring corresponding constraints into existence in all other layers of the model. This suggests the existence of a network of causal relations, which connects with the discussion about levels of organizations we mentioned at the beginning of Section 3. Close to such considerations live the controversial discussions about the 'explanatory gap' (Levine 1983) between the phenomenal aspects of our experience and the underlying physical states, and downward causation (Campbell 1974), where the question is whether higher-level entities or properties can exert causal influence on lower-level ones. The unidirectionality of the downward causation arrow is not evident. Craver and Bechtel (2007, 559–560) discuss the illusion of causation in an organism at the top level of a hierarchy, which in spite of seemingly having an effect on its constitutive parts at the bottom chemical level, turns out to be due to other bottom-level effects in the first place. There would thus just

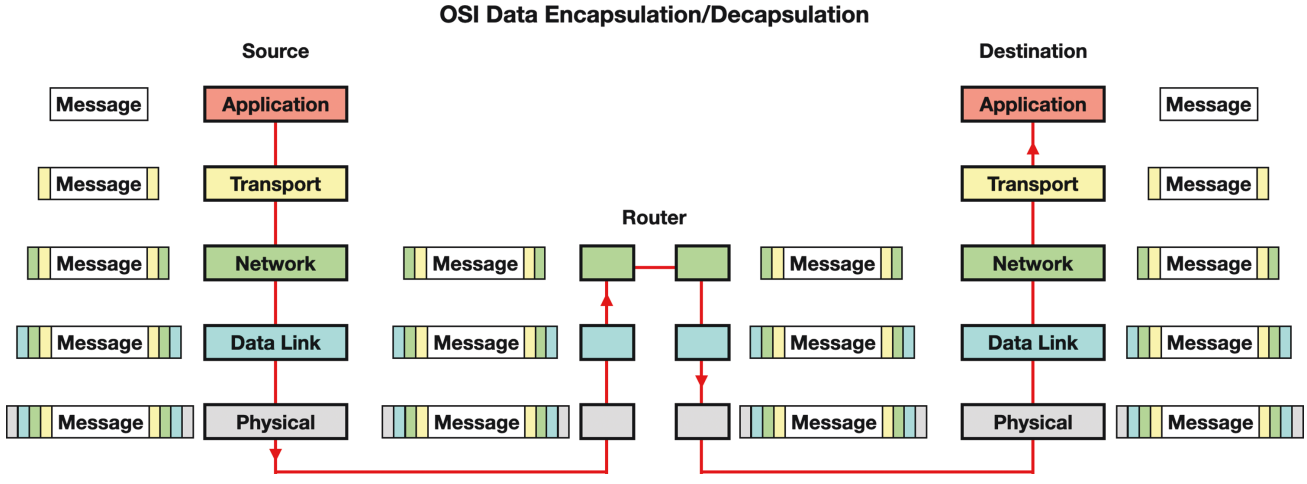

Figure 6.2: OSI Data Encapsulation/Decapsulation.
This diagram shows the Open Systems Interconnection model of the Internet, exemplifying the process of sending a message that will be successively encapsulated and decapsulated. The key concepts of this computational model, as well as several others imported from mathematics, shed light on the importance of bracketing and distinguishing mechanisms between layers.

be regular same-level causal relationships that have "mechanistically mediated" effects downwards, due to constraints defined on relationships between elements in different levels. A different way to address such downward causation is to consider that processes at the lower levels of a hierarchy are constrained by and act in conformity to the laws of the higher level (Campbell 1974, 180). For example, in DNA, the specific way that amino acids code for functions and the way the proteins they form fold at the molecular level both strongly depend on environmental conditions which wound up selecting for the specific coding system in the context of the units of selection, and external factors in the cell, such as the presence of molecular chaperones that facilitate folding. It should be noted that although we did not deal with these issues in this paper, there has been much discussion about how phenomenology may contribute to these discussions (Roy et al. 1999; Thompson 2007; Kirchhoff and Hutto 2016).

In the model we propose relating physics, psychology, and transcendental phenomenology, there is no preferential direction for a causation arrow. The model may be constructed starting from any of the three layers, to move to the other ones, with no sense of precedence or supervenience of either of them over the others. This means that one may reason starting from their experience of the experience of objects (reflection), as well as from objects of such experiences, as the neighboring layers may perfectly well be reconstructed from any starting point. Furthermore, there is no reason why starting in reverse order, from transcendental experience to physics, should not feel just as natural as the opposite way around. The only way to find out about our experience is to turn our attention towards it, which can only be done by using a proper metalanguage to describe specific relations among experiences. Next, one may use the language of phenomenological psychology to describe subjective experiences of objects. The key point is that certain constraints may only appear from the level of description of subjective experiences to the interactions between fundamental material objects of our universe. This should not come as a surprise, as our knowledge of physics in the first place comes from constructing a shared language based on our subjective experience of the world. Physics, in that sense, is intrinsically intersubjective, and always implicitly incorporates the structures of experiences in its theory.

5 Conclusion

We started this paper by pointing out three ways of understanding what it may mean to reflect on one's experience of looking at the snow: (1) an instance of *introspection* where a physical self is attending to its own experience, (2) an instance of

psychological reflection where a psychological self is attending to its own experience in a phenomenological manner, and (3) an instance of *transcendental-phenomenological reflection* where a transcendental-phenomenological self is attending to its own experience. The notation that we introduced in the experience levels matrix clarifies the distinction very clearly. Reflection is understood as a form of introspection – one attends to one's experience introspectively – when both the reflected on experience and reflection are understood in physical terms, thereby remaining in the single layer of physics ($x \circ x \circ o$). Phenomenological reflection of the psychological sort operates over two layers between the phenomenological experience and the physical object, and they can do so legitimately by bracketing the existence of the physical object. Therefore, the phenomenological psychologist attends to the intentional structures of our experience, studying both the modes of consciousness and the objects as they are intended. The distinction between this kind of reflection *(x'∘x'∘[o])* and transcendental-phenomenological reflection *(x''∘[x']∘[o])* becomes evident when we see that transcendental-phenomenological reflection, unlike psychological-phenomenological reflection, no longer operates with the identity of the reflected on experience with itself as the mind that exists in the world. Having bracketed the existence of the mind presupposed by phenomenological psychologists, the transcendental phenomenologist operates with three layers, the transcendental, the psychological, and the physical, and legitimately so by bracketing both the existence of the mind (psychology) and the world (physics).[14] In this way, the transcendental phenomenologist attends to the intentional structures of our experience with a view of understanding how the meaning and validity of objects and the world are constituted in our experience. Besides other suggestions based on analogies from mathematics and computer science, the matrix also clarifies the conditions in which variables and operators require careful translation, which is a key process in a multidisciplinary field such as the study of one's experience. We hope that our formalism of the bracketing, together with the matrix, will open up constructive conversations between disciplines and contribute towards a more comprehensive understanding of the structures of our experience.

14 One could argue that transcendental-phenomenological reflection only operates with two layers, the transcendental and the psychophysical. This is justifiable when one bypasses the psychological layer to move to the transcendental layer, as noted in footnote 13. We have here defined transcendental-phenomenological reflection as operating with three layers for the purpose of distinguishing it from psychological-phenomenological reflection.

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