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**Towards Integrating Husserlian Phenomenology  
with Cognitive Neuroscience of Consciousness**

**Abstract**

*The paper presents, first, some general remarks about Husserl's philosophical Phenomenology in view of relating it to the scientific study of consciousness, and recalls some of the basic methodological tenets of a Husserlian phenomenology of consciousness (I). It then introduces some recent work on so-called "mental imagery" in cognitive psychology and neuroscience (II). Next, a detailed exposition of a reflective analysis of conscious experiences that involve "imagery" or "images" is given (III), arguing thereby that reflective conceptual clarifications of various forms of such experiences could contribute to research into their finer details. In order to show more distinctly that the conscious experiences involved in the contemporary cognitive and neuroscientific imagery research are indeed differently structured, a simple notation for designating the various structural components of the experiences under study will be used. In concluding (IV), some methodological assets concerning the present proposal of integrating the method of Husserlian phenomenology into the present-day, and hopefully even more so into the future study of consciousness are highlighted!*

**Keywords**

consciousness, Husserl's methodology, cognitive neuroscience, first-person data, third-person data, mental imagery

About one hundred years ago, for Husserl's philosophical Phenomenology, it was crucial that the study of consciousness be undertaken from the *subjective, first-personal point of view* of reflecting upon conscious experiences and the ways of givenness of their objective correlates. Nowadays, the study of consciousness is again enjoying considerable interest, not only within analytic philosophy of mind, but equally so in some branches of the natural sciences, especially in the cognitive neuroscience, where *objective, third-person* methodologies are all-important. A few years ago, in a Special Issue of *Cognition* on "The Cognitive Neuroscience of Consciousness", Daniel Dennett (2001) observed in his contribution, "Are we explaining consciousness yet?", that

"(T)he recent history of neuroscience can be seen as a series of triumphs for the lovers of detail. Yes, the specific geometry of the connectivity matters; yes, the location of specific neuromodulators and their effects matter; yes, the architecture matters; yes, the fine temporal rhythms of the spiking patterns matter, and so on. Many of the fond hopes of opportunistic minimalists have been dashed: they had hoped they could leave out various things, and they have learned that no, if you leave out x, or y, or z, you can't explain how the mind works." (p. 234)

Just so, *mutatis mutandis*, I would like to urge, it is with regard to *the details of conscious experiences*; these details matter too if you want to explain the conscious mind, and they are – *pace* Dennett – only accessible to reflective

phenomenology. Everyday introspection and common or “folk” concepts of the mind and consciousness which, based on such introspection, find their linguistic expression in our everyday languages can no longer suffice for guiding the experimental work in the neuroscience of consciousness; nor can reflective phenomenology merely rely on everyday introspection and “folk” concepts.

Recently, several proposals for conceptual and methodological cooperation between neuroscientists and philosophers, particularly phenomenologically oriented ones, studying consciousness from an objective and a subjective perspective, respectively, have been made. I am thinking of the late Francisco Varela and his collaborators’ (1999, 2003) “neurophenomenology” with its working hypothesis of reciprocal constraints between phenomenological accounts of the structure of experience and their counterparts in cognitive science; of David Chalmers’ (2004) advocacy of integrating the two classes of data, the objective and the subjective ones, into a scientific framework and of building an explanatory connection between them; and of Shaun Gallagher’s (2003) call for a “front-loaded phenomenology”, making direct use of phenomenology in the design of empirical investigations of consciousness. This paper joins such attempts at methodologically controlled ways of integrating scientific, objective, third-person data related to consciousness and phenomenological, subjective, first-person data pertaining to conscious experiences. I will argue that the ever more advancing studies into the brain in “the quest for consciousness” (C. Koch, 2004) should take advantage of what clarifications of the very subject-matter along the lines of philosophical Phenomenology can provide. For it seems clear and, probably, even uncontroversial that when scientists study the workings of the brain with the aim of looking for a scientific, ultimately a physical, explanation of consciousness, a distinct conception of what they are seeking to explain is requisite.

The paper is organized as follows. After some general remarks about Husserl’s philosophical phenomenology, in view of relating it to the scientific study of consciousness, and recalling some of the basic methodological tenets of a Husserlian phenomenology of consciousness (I), I will have a look at some recent work on so-called “mental imagery” in cognitive psychology and neuroscience (II), and then I turn to a detailed exposition of a reflective analysis of conscious experiences that involve “imagery” or “images” (III), arguing thereby that reflective conceptual clarifications of various forms of such experiences could contribute to research into their finer details. In order to show as distinctly as I can that the conscious experiences involved in the contemporary cognitive and neuroscientific imagery research are indeed distinctly differently structured, I will introduce a *phenomenological notation* for designating the various structural components of the experiences under study. In concluding (IV), I will highlight some methodological assets concerning the present proposal of integrating the method of Husserlian phenomenology into the present-day, and hopefully even more so into the future study of consciousness!

## I

In his programmatic Inaugural Lecture at the University of Freiburg in 1917, Husserl spoke of his enterprise of descriptive “pure phenomenology” as “the science of pure consciousness”, or as “science of the pure phenomena”, though obviously not taking ‘science’ in the sense of the empirical natural sciences,

relying on objective, third-person data. Rather, he viewed pure phenomenology as “a new philosophical basic science”, making philosophy itself as a rigorous science first of all possible. However, the brand of first-person methodology Husserl proposed for studying the nature or essence of phenomena of consciousness, in my understanding, makes the phenomenological findings eminently suitable, not only for properly philosophical concerns regarding the ultimate interpretation of what there is and what it is like in a transcendental perspective, but also for integration into a scientific research program concerning consciousness and its place in nature. For Husserl’s methodology crucially relies on rigorously confining the analysis to that which reflection upon *experiences themselves and purely as such* – qua *consciousness of something* of one kind or another – provides, with a view to elaborating concepts of the very *possibility in principle* of experiencing this or that in such and such a way. Such properly *phenomenological concepts* bring forth certain *a priori constraints* concerning possible explanations of the structures of conscious experiences, and lawful dependencies among them. With regard to its potential in a scientific context, the phenomenological conception of consciousness would thus seem to make available a detailed general description of the very *explanandum* that any scientific study of consciousness would have to take advantage of.

Husserl explicitly confined the analytic work to that which reflection upon conscious experiences themselves provides, and this with regard to the subjective side of the acts as well as with regard to the objects of these acts, i.e. exclusively as their intentional correlates. In this way he was able to secure a *pure givenness* of his research domain as an *independent* field of investigation. More technically speaking, with the method of what Husserl termed “phenomenological reduction”, he aimed at distinctly delimiting the research domain of phenomenological analysis in its characteristic ownness [*Eigenwesentlichkeit*], that is, at establishing a theme of investigation unmixed with empirical matters of fact. Thus, he left behind the commonsensical everyday conception of conscious experiences as psychological data ascribable to this or that creature, oneself included, understood as this and this empirical self. Moreover, for his theme of investigation, he also set aside the natural scientific conception of experiences as ultimately neurological processes in the brain. As a consequence, one of the most often recurring expressions in Husserl’s writings is that of considering “consciousness purely as it itself [*Bewusstsein rein als es selbst*]”, namely just as it can be given in *pure* reflection.

For present purposes, it is crucial to be alert from the outset to the following point that Husserl very often discussed throughout his work. According to him, there is, if not (yet) in practice, at least in theory a close affinity between psychology and phenomenological philosophy, precisely because in his view, both psychology and philosophy have to deal with consciousness, albeit in radically different “attitudes”: viz. in the natural and the phenomenological attitude, respectively. However, in spite of the philosophically decisive difference of these two attitudes, Husserl kept pointing out untiringly that with regard to what *essentially* – or as he liked to say, *eidetically* – makes up a conscious experience of one kind or another taken purely in it itself, there is no difference, and there can be none, between the empirical psychological conception of consciousness on the one hand, and the transcendental-phenomenological one on the other. I fully endorse this view, that rests on one’s practice of the reflective-eidetic analysis, with or without transcendental reduction – depending on what you want to clarify – and I would like to make

productive use of the specifically phenomenological-psychological conception in cooperation with cognitive neuroscience. Ideally, and no doubt only in the long run, it should become possible to establish lawful correlations and causal, or at least conditional, dependencies between phenomenological and neurological data concerning the conscious mind.

Now while a *scientific* understanding is no doubt quite generally based on objective, third-person data, with consciousness as the *explanandum* of the scientific investigation, subjective, first-person data must play an indispensable role in describing it. As I see things, and taking up a phrase from Gerald M. Edelman and Giulio Tononi (2000), the most promising way of “bringing consciousness into the house of science”, is to use the term “consciousness” to refer to *experiences* of one kind or another, accounting thereby for the different *kinds* of experience not just in terms of phenomenal or qualitative states, but rather by *articulating their respective internal structures* with the help of phenomenological methods. In so doing, however, it is crucial not to suppose that recourse to phenomenology is tantamount to relying on so-called introspective, personal (even idiosyncratic) findings. In this regard, I want to emphasize that it would be a mistake to assimilate Husserlian phenomenology to one or another form of individual introspection (or retrospection, for that matter).

Briefly, why do I think it is important *not* to take Husserlian phenomenology to be a variety of psychological introspection? First, it is worth recalling that Husserl himself repeatedly complained about the assimilation of phenomenology to a variety of psychological introspection or “inner observation”. For example, in a text written in 1912, he speaks of “the basically perverted view that with phenomenology it is a matter of a restitution of the method of inner observation or of direct inner experience in general” (Husserl 1980: 33). What did Husserl have in mind when he so adamantly rejected being associated with practicing a method of introspection or inner observation? As I understand the controversy, the main point to recall is that Husserl conceived of the phenomenological analysis of conscious experiences in a *mathematical* spirit, that is, as a reflection-based elaboration of the structures or forms of experiences in accordance with their *a priori possibilities*, i.e. unconcerned with empirical matters of fact regarding the very phenomena under study.<sup>1</sup> As Husserl put it in a lecture course from 1907:

“The conditions of the ‘possibility of experience’ are the first. Conditions of the possibility of experience signify, and may signify, here, however, nothing else than all that resides immanently in the essence of experience, in its *essentia*, and thereby belongs to it irrevocably. The essence of experience, which is what is investigated in the phenomenological analysis of experience, is the same as the possibility of experience, and everything established about the essence, about the possibility of experience, is *eo ipso* a condition of the possibility of experience.” (1997, § 40, p. 119)

I take this emphasis on the *conditions of the possibility* of conscious experiences very seriously. The matter may also be put thusly: “eidetic data”, i.e. data concerned with “*what it is*”, i.e. according to its essential possibility, to experience something one way or another, are crucial, especially so in the present context in which I would like to make it look like a plausible, even a desirable enterprise, to work towards the integration of *phenomenological findings* with all the other evidence that neuroscientific and psychological studies about the phenomena of consciousness are able to accumulate.

Husserl’s first concern, then, was with analyzing the *ideal possibilities* of conscious experiences of something as such, and with the system of possible

modifications of such experiences, rather than with these experiences and their intentional objects *as actual matters of fact*. A concern with empirical matters of fact is proper to the sciences, and justly so. Logically prior to this empirical work, however, there is always the question of what a conscious experience of a certain kind consists in: namely, an experience of the kind to be explained in (neuro-)scientific terms.

To be sure, in the course of the very formation of phenomenological concepts, a given conscious experience of something provides the experiential basis for the sought-after description of its invariant structure or form according to its very possibility (that is, in Husserlian terms, according to its *eidōs* or “essence”). Thus, for example, a conscious experience of imagining a flying elephant, or a case of recollecting an episode from one’s own life, will be submitted to such analysis. Of such experiences we all have an everyday knowledge of acquaintance that is reflected in the mental vocabulary of ordinary languages. In a way, then, as Husserl occasionally says, we all “know” of essential differences of being conscious; however, this knowledge is only *implicit*, and it is just the task of phenomenological reflection and eidetic analysis systematically to explicate distinct phenomenological concepts of the various kinds of consciousness. Based on one’s everyday familiarity with a conscious experience of a certain kind as designated in ordinary language, a factually chosen case will be taken *as a purely arbitrary example* of its kind, a mere starting point for the analysis. Regarding this methodological step, Husserl liked to refer to the mathematicians’ way of starting their analyses by saying, “there are...” (“es gibt...”), say, such and such geometrical figures, prime numbers, etc.<sup>2</sup> Similarly, Husserl suggested, the phenomenologist adopts the attitude of saying, “there is, say, an experience of imagining something”, etc. The chosen experience, forming in this sense nothing more than an arbitrarily selected example, does not bind the phenomenologist *qua* this or that particular subjective experience, existing as a psychological matter of fact which is such and so determined, occurring for example with this or that degree of vivacity and distinctness of content, etc. The irrelevance of the psychological matter of fact *as such* for the purpose of the phenomenological concept formation proper can also be seen when we realize that we must engage in a process of varying the conditions in order to define which ones are invariably required, or essential, for making the experience possible as against those that can be changed without altering the essential structure of the experience *qua* experience of the kind now to be reflectively differentiated from other kinds. Phenomenological analysis, then, is only interested in truly constituent parts or properties capable of being distinguished in reflection as belonging to the conscious experience under study in its own essence or nature, i.e. in accordance with the conditions of the possibility of its occurrence, and not of the actuality in its variability as a psychological matter of fact.

This view has important consequences with respect to the question of errors and the scientifically indispensable possibility of the control of phenomenological results. Since the description of a conscious experience, based on reflection that is *in fact* performed by me, is *not* bound to the factual experience *as such*, someone else besides myself is able in principal, on the basis of an instance of the same *kind* of experience, to check at any time the adequacy of a given reflective description by focusing for him- or herself on that which,

1

See, e.g., Husserl 1980: § 8; 1987: 79f.; 233–246; 250–252; 266; 1989: 13–20.

2

See, e.g., Husserl 1980: § 8, p. 41; see also Husserl 1985, § 96.

according to its very possibility, makes up the experience *as one of this kind*. To be sure, here as in any form of scientific investigation, errors are in principle always possible and are to be corrected by additional investigations, as already Husserl himself clearly pointed out.<sup>3</sup>

Another important methodological point regarding the phenomenological analysis itself should be addressed. It is linked to the fact that phenomenological data concerning conscious experiences are to be understood as *first-person* data, even when they are considered as *eidetic* data. At a first glance, it might appear to be the case that eidetic data concerning structures or forms of conscious experiences and of their intentional correlates must be themselves “objective” rather than “subjective” and thus no longer *first-person* data at all, since they are not being taken *as factually mine*. Now while it is true that phenomenology is concerned with consciousness *in general* and not with, say, consciousness as mine or yours or anyone’s *in particular*, attention should nevertheless be given to the special way in which phenomena of consciousness do occur at all. Phenomena of consciousness are first of all (as Husserl was fond of putting it) “lived through” (“*durchlebt*”); in this sense, they are *experientially* – that is, prior to any reflection – *given to someone*. As a matter of fact, they are lived through by, or experientially given to, me or you, him or her etc.; they are not objectively out there to be reflected upon by just anyone. Moreover, there obtains a crucial asymmetry of access with regard to the experiences that serve the person doing phenomenology as the basis for the reflective-descriptive analysis of what an experience of a certain kind consists in. I have in mind the asymmetry between *original* and *non-original* access (the latter being also called “indirect access” or “access by analogy”). As I see it, this asymmetry is, precisely, linked to the special way phenomena of consciousness first of all occur to someone experientially. For example, among the re-presentations of experiences in view of analyzing them reflectively, I myself have *original* access to those experiences of which it is possible to say that they can or could be given to me experientially, i.e. prior to the work of reflection, and only *I* have such access to them. By contrast, among my re-presentations of experiences, I have only *non-original* (indirect) access to those experiences which I attribute to others as being experientially (and thus for them, and only for them, originally) given conscious experiences.

Now, when I want to determine the essential possibility of what it is like to be consciously experiencing something in one way or another – say, to imagine something or to remember something, etc. – I will reflect first of all on experiences that are mine, or that could be mine if I were to re-present them to myself. Experientially given instances, however, are just first-personal or “subjectively given” experiences. They will *implicitly* contain just those differences of consciousness of which I am pre-reflectively aware. Phenomenology then aims at making *explicit* these differences as belonging to the possible experiences of this or that kind *as such*, and thus as making up eidetic data. As I understand the connection between phenomenological data as *eidetic* data and as *first-person* data, it must be appreciated that the descriptions of structures of conscious experiences in general – i.e. of structures that are eidetically determined on the basis of one’s reflection upon just any re-presented instance of the kind one is acquainted with in daily life – will only become *intelligible as descriptions of such structures of conscious experiences* for someone who *actually* carries out him- or herself a reflection upon an instance of the kind in question and, therefore, realizes a cognitive achievement with regard to something accessible only from within, i.e. from

his or her first-person perspective. Such *explicitations* of what is implicit in natural, pre-reflective consciousness are apt to provide what I would like to call *phenomenological constraints* to be taken account of in any experimental study and scientific explanation of the phenomena of consciousness. Before illustrating this step of my argument, let me turn to some neuroscientific studies that I happen to be aware of and which I find particularly interesting for a discussion from the point of view of Husserlian phenomenology.

## II

Within the scope of this paper, I limit my remarks to work on *mental imagery* and the neural foundations of imagery. S. M. Kosslyn and his collaborators, in particular, think that until recently mental imagery had “fallen within the purview of philosophy and cognitive psychology”. According to them, in a review article, “Neural foundations of imagery”,<sup>4</sup> both philosophy and cognitive psychology “have raised important questions about imagery, but have not made substantial progress in answering them”. “With the advent of cognitive neuroscience”, however, “these questions have become empirically tractable”. New neuroimaging technologies, especially positron emission tomography (PET) and functional magnetic resonance imaging (fMRI), can assess relative changes in brain metabolism and blood flow with great spatial accuracy, allowing theories of imagery to be tested objectively in humans (2001: 635; see also Edelman and Tononi, 52). Taking advantage of these developments, and already of the advent of additional technologies, such as laser-based diffuse optical tomography (DOT) (641f.), researchers have shown “that mental imagery draws on much the same neural machinery as perception in the same modality” (635). Indeed, approximately two-thirds of all the brain areas activated during perception and during imagery were found to be activated in both cases (2001: 636; see study by Kosslyn et al. from 1997). These and other findings indicate that imagery and perception share very specific, specialized mechanisms. But the two, imagery and perception, do not draw on identical processes. As Kosslyn et al. put it:

“Although shape, location and surface characteristics are represented and interpreted *in similar ways* during both functions, the two *differ* in key ways: imagery, unlike perception, does not require low-level organizational processing, whereas perception, unlike imagery, does not require us to activate information in memory when the stimulus is not present” (2001: 636; emphasis mine).

Imagery researchers, such as Kosslyn et al., conclude that “images are in fact *internal representations*” (641) “that *depict* information, not describe it” (639), and this they take to be “evidence that mental imagery relies on actual images” (639), evidence that seems mainly to be gathered from the activation of the early visual cortex (comprising areas 17 and 18, the first ones receiving input from the eyes (see 639) and to be quite solidly supported by numerous imaging studies (fMRI and PET, in particular, 640). However, as I perceive the work on imagery, I as a phenomenologist continue to be dissatisfied as regards the lack of appreciation, in this work, of fundamentally differently structured ways of intentionally referring to something in using imagery.

3

See, e.g., Husserl 1982, § 87; Husserl 1987: pp. 246: “Die ‘Unfehlbarkeit’ der Wesensanschauung”.

4

See Kosslyn et al. (2001); if not otherwise stated, references will be to this paper.

Such lack seems to me apparent when Kosslyn et al., in their review of mental imagery work, report that, e.g., *visualizing* an object has much the same effects on the body as *actually seeing* the object, or when subjects *view pictures* of the objects under study, e.g., threatening objects. Again, they say, *much the same effects* on the body occur, as recordings from single cells in the human brain have shown, “while subjects were shown pictures or formed mental images of those same pictures” (641).

As I understand all this, I suppose that, *taken in isolation*, the findings of overlapping specific cortical areas in perception and imagery do indeed corroborate the view of an inner connection between perception and forms of imagination and picturing, showing “much the same effects on the body”. However, our conscious experiences do occur as *unified experiences* containing a differentiated manifold of moments or components within themselves, only some parts of which seem to overlap, whereas the concrete experiences, as the wholes they are, are lived through with a distinctly different consciousness of the objects given in their presence or absence. And with regard to this aspect of the topic – namely, relative to the modes of *consciousness* that are involved in imagery – some more developed phenomenology is called for, as I will try presently to show.

### III

In order further to clarify what some of the conscious experiences that would appear to be involved in such neuroscientific investigations consist in, and how they may be lawfully related to one another, let us return to Husserlian phenomenology. I will be paying special attention to the *phenomena of intentional implication or modification* of experiences within the unified re-presentational experiences of imagining and picturing, and combinations thereof. As I understand the neuroscientific research in question, one of the most vital aspects of the search for neural correlates is that such correlates should provide an answer to the question of the so-called *binding problem*, i.e. the problem of how it is that we are aware of coherent perceptual scenes, that we are able to act coherently in the presence of diverse, often conflicting, sensory stimuli.<sup>5</sup> In my view, phenomenological clarifications of conscious experiences, in so far as they aim at making explicit *lawful internal connections among the components making up those unified experiences*, are particularly apt to shed light on the issue of the binding of diverse stimuli by synchronized neural firing and, therefore, to play a heuristic role in designing neuroscientific research concerned with processes of neural interaction across many levels of organization.

Using a simple *phenomenological notation* for designating the components and the structural relationships inherent, in particular, in re-presentational conscious experiences such as imagining or picturing something, or combinations thereof, I hope to make my argument more transparent and amenable to discussion. It is worth stressing right away that the formulae of the notation that are meant to mirror the structure or form of unified conscious experiences of one kind or another must be read and interpreted from the point of view of *reflection* upon mental activities and their intentional correlates in the first-person perspective.<sup>6</sup>

Let me now become more specific. With the help of the notation, I try to show that phenomenological first-person data can, on the one hand, be seen to corroborate the scientifically well-established view of an *inner connection* be-

tween perception and forms of imagination and picturing. On the other hand, however – the neuroscientific finding of “much the *same* effects on the body” *notwithstanding*, as measured in perception and when using imagery and/or pictures (see section II, above) – phenomenological analysis of the relevant re-presentational experiences crucially makes explicit that distinctly different ways of intentionally referring to some re-presented object in using imagery and/or pictures are involved.

Consider in turn, along the lines of the work on mental imagery reviewed by Kosslyn et al.: (1) a case of simply actually seeing – “PER” – an object *x* presently out there; (2) visualizing – “IMA” – the object using imagery; (3) viewing a picture – “PIC” – of the same object *x*; (4) imagining (or remembering) the picture – “IMA PIC”, or “REM PIC” – showing the same object *x*.

When one phenomenologically examines these cases, it will be helpful to ask oneself, how is the object *x* given in each one of these experiences of intentionally referring to *x*? Or to ask oneself, what is it that I do in order to have *x* given to me? Proceeding in this way reflectively, so to speak backwards, from the intended object *x* “out there” (in the real world or in some fictional setting) to the modes of givenness of this object in my conscious experiences, the following four structurally clearly distinct formulae for the phenomenological forms of these experiences obtain:

(1) actually simply seeing object *x*, reflectively yields:

(PER) *x*

i.e. *x* is given by means of actually perceiving *x*.

(2) visually imagining, i.e. visualizing, object *x*:

(IMA) *x*, reflectively analyzed, yields

i  $\frac{\text{REP} - [\text{PER}]}{(\text{PRE})s} - / \vdash x$

i.e. some fictional or real object *x* is given to me

in my actually re-presenting *x*

by means of a neutrally re-presented perceiving of *x*

while I am at the same time actually presenting my surroundings *s*.

Put another way:

I (the subject of the experience), while grounded in the presentation of my actual surroundings *s*, am re-presenting some fictional or real object *x*

by means of re-presenting a neutralized perceiving of *x*.

(3) Viewing a picture of object *x*, or having an image consciousness of *x*:

(PIC) *x*, reflectively analyzed, yields

i  $\frac{\text{REP} - [\text{PER}] - \frac{x}{y}}{(\text{PRE})s} \mid \vdash / - x$

5

See, e.g., Edelman and Tononi (2000), p. 106f.

presentation of the very idea of a phenomenological notation and its elements, see Marbach (1993), ch. 1, and Marbach (forthcoming).

6

For a brief survey of the elements of the notation, see the *Appendix*; for a more detailed

i.e. some real or fictional object  $x$  is given to me, or appears to me,  
in my actually re-presenting  $x$   
by means of re-presenting a neutralized perceiving of  $x$   
in so far as  $x$ , taken for unreal, appears in the picture  $y$  that I actually  
perceive  
while at the same time my surroundings  $s$  are actually presented.

Again putting it another way:

I while grounded in the presentation of my actual surroundings  $s$   
am re-presenting a real or fictional  $x$  by means of re-presenting  
a neutralized perceiving of  $x$  in so far as  $x$  appears  
in the picture  $y$  that I actually perceive.

Regarding the more complex formula for the experience of imagining a picture showing  $x$ , (4) IMA PIC  $x$ , the formula may be developed in three steps in view of making the reflective analysis more transparent:

(4) Imagining to be picturing object  $x$ ; or taking up Kosslyn et al's terms:  
forming a mental image of a picture of object  $x$ :

(IMA PIC)  $x$ , reflectively analyzed yields

$$(4a) \quad i \frac{\quad}{(PRE) s} (\text{REP} - [\text{REP} \dots]) \uparrow / - x$$

i.e. some real or fictional object  $x$  is given to me  
in my actually re-presenting  $x$   
by means of a neutrally re-presented re-presenting of  $x$   
while at the same time my surroundings  $s$  are actually presented.

$$(4b) \quad i \frac{\quad}{(PRE) s} (\text{REP} - [\text{REP} - \frac{\quad}{-[\text{PER}]}]) - \frac{x}{y} \uparrow / - x$$

i.e. some real or fictional object  $x$  is given to me  
in my actually re-presenting  $x$   
by means of a neutrally re-presented re-presenting of  $x$ ,  
such that a neutralized perceiving of  $x$  is re-presented  
in so far as  $x$ , taken to be unreal, appears in the picture  $y$  that is given to me  
by means of a neutrally re-presented perceiving of  $y$   
while at the same time my surroundings  $s$  are actually presented.

$$(4c) \quad i \frac{\quad}{(PRE) s} (\text{REP} - [\frac{\quad}{-[\text{PER}] s'} \text{REP} - \frac{\quad}{-[\text{PER}]}]) - \frac{x}{y} \uparrow / - x$$

i.e. some real or fictional object  $x$  is given to me  
in my actually re-presenting  $x$   
by means of a neutrally re-presented re-presenting of  $x$ ,  
such that, while quasi-grounded in a neutrally re-presented presentation  
of my surroundings  $s'$ , a neutralized perceiving of  $x$  is re-presented  
in so far as  $x$ , taken to be unreal, appears in the picture  $y$  that is given to me  
by means of a neutrally re-presented perceiving of  $y$   
while at the same time my surroundings  $s$  are actually presented.

Again, the description of the structure could be put in terms of what the subject of experience, I, is doing when performing an act of IMA PIC  $x$ :

I while grounded in the presentation of my actual surroundings  $s$  am re-presenting a real or fictional  $x$  by means of neutrally re-presenting another act of re-presenting  $x$ , such that, while quasi-grounded in the neutrally re-presented presentation of my surroundings  $s'$ , a perceiving of  $x$  is re-presented to be a neutrally re-presented perceiving of  $x$ , in so far as  $x$ , taken to be unreal, appears in the picture  $y$  that is re-presented by means of neutrally re-presenting a perceiving of  $y$ .

Now, as hinted above, it should, on the one hand, be visible from formulae (1), (2), (3) and (4c) that the expression 'PER', designating an activity of perceiving, recurs each time. In (1) as designating an actually occurring activity of perceiving the object, indicated by the parentheses '(.....)'; in (2), (3) and (4c), the expression 'PER' appears within a pair of brackets, '[.....]', contained on the upper line of the formulae, indicating thereby that the activity of perceiving is only re-presented and *no longer experienced as actually occurring*. In other terms, perceiving is involved as being *intentionally implied or modified* within the consciously experienced unity of actually establishing intentional reference to the re-presented object  $x$ . Thus, even though in some way it is the "same" perceptual activity with the "same" objective phenomenal content – say, an object  $x$  in its surroundings appearing in such and such shapes and colours – that occurs in one's actually seeing  $x$  as well as in one's visually re-presenting  $x$  in one way or another, it is clear that *experientially*, i.e. from the first-person perspective of my conscious experiences, the intentional reference to the object  $x$  is altogether differently characterized when I am actually seeing  $x$  as against only re-presenting a seeing of  $x$  in one way or another. And these are much sharper differences between perception and imagery than the ones mentioned by Kosslyn et al. themselves concerning aspects of organizational processing and of activation of information (see above). The differences I have in mind are epistemic, instead; they are crucial with respect to how I take a given object to be (e.g., real, fictional, in the past, in a merely imagined world, etc.), and how I take a given re-presented perceptual (or any other) activity to be (e.g., believed to have occurred in the past, or merely imagined without belief nor disbelief, but neutrally, etc.). Such differences truly make a difference in our daily life...

The various formulae permit succinctly to show that, besides the component 'PER', much else is also involved, making an experience of simply seeing an object distinctly different from any experience of re-presentationally referring to the same object and making one kind of re-presentational experience distinctly different from another kind. To round off these reflection-based remarks, let me mention, in particular, the component of the unified experience that is expressed as

' \_\_\_\_\_ ' and that appears in (2), (3) and (4), all three being forms of (PRE)s re-presentational

experiences that arise, so to speak, out of a grounding activity of presenting one's actual surroundings  $s$ : (PRE)s. As I understand the matter, this contrast between some presentational and simultaneously occurring re-presentational activity within a unified experience of re-presentational consciousness of something is a crucial first-person phenomenological datum. This contrast can be found to be reiterated in (4), making that experience of visually referring to the object  $x$  all the more involved in contrast to the other experiences the formulae of which are shown in (2) and (3), respectively. Last but not least, a

further crucial first-person phenomenological datum concerns the difference between (2) – Kosslyn et al.’s visualizing – and (3) as well as (4) – involving pictures – that can be gathered from the formulae by noting that in (3) and (4) the object referred to is not the object  $x$  as it were *itself*, as it is the case in (2), but rather the complex “double-object” of ‘ $-x/y \mid \vdash /-x$ ’, i.e. the object  $x$  (the depicted object) in so far as it appears in the picture  $y$ .

Now I want to suggest that these and other reflective findings providing first-person data should be systematically *integrated* with third-person neuroscientific data concerning conscious experiences that make use of imagery in one way or another. The first-person phenomenological data, understood as *eidetic* data that provide insight into structures or forms of conscious experiences *in general* in the sense explained in section I above, form the basis for *phenomenological concepts* that help *describe* the phenomena to be *explained* scientifically with the help of neuroscientific experimentation. I would expect the phenomenological data to be particularly valuable in the search for the neural foundations of imagery that can plausibly be hypothesized to be underlying occurrences of unified experiences of one kind or another using imagery. More specifically, the phenomenologically conceptualized data should be of heuristic use for determining more precisely which synchronous neural firings are involved in using imagery by means of re-presenting in one way or another a perceiving of an object – for the *binding problem* is obviously not limited to the sphere of perceptual-phenomenal consciousness in actual perception.

Thus, elaborating a little more on what I have in mind in view of integrating first- and third-person-data, consider the following phenomenological constraints to be taken account of in the experimental work: In a case of simply visualizing an object  $x$  (see formula [2], above) some neural activity should be identifiable using third-person data in correspondence to a person’s consciously modified experience of *seeing as it were* that is implied in referring to the object  $x$ , such that the pattern would not only show an objective overlap with a pattern of some actual seeing of  $x$  (see formula [1], above), say, concerning data corresponding to the shape and colour of object  $x$ . Instead, the pattern of neural firing would have clearly to differ in its overall shape, given the phenomenologically crucial difference between a person’s *actually* experiencing something with reference to object  $x$  as against *only as it were* experiencing something with reference to the same object  $x$  in one’s visually imagining the object while at the same time actually experiencing something with reference to one’s present surroundings. Similarly again, but with some additional complications, if we were to contrast the case of visualizing the object  $x$  (see formula (2), above) and the case of forming a mental image of a picture of object  $x$  (see formula (4c), above). The corresponding patterns of neural firings would have to differ radically from one another, given the radically different subjective experiences described above with the help of phenomenological concepts.

#### IV

To conclude, let me highlight some methodological assets concerning the present proposal for integrating third-person neuroscientific data and first-person experiential or phenomenological data. It is no doubt true, as Chalmers (2004) points out, that “by far the most common way of gathering data about the conscious experiences of other subjects is to rely on their verbal reports”. And importantly, these data are not to be treated “just as third-person data

(as a behaviourist might, limiting the datum to the fact that a subject made a certain noise)”; rather it is a matter of treating “the report as a report of first-person data that are available to the subject”. Gathering reliable first-person data concerning *conscious experiences as such* is, however, not that straightforward a method. For what I have tried to argue so far may also be put like this. To promote the idea of “‘front-loaded’ phenomenology” in the sense of making direct use of phenomenology in the design of neuroscientific experiments (Gallagher, 2003), it is crucial that the verbal reports be reflectively gathered descriptive reports about *eidetic* structures of consciousness. Such reports or descriptions are to be elaborated *prior to* an experiment. Ideally, a methodologically sophisticated phenomenologist should be included in a research team, providing, in advance of an experiment, the relevant structural first-person data concerning possible conscious experiences. Researchers could then take the phenomenologist’s descriptive report of this or that kind of conscious experience as a heuristic guide for designing experiments that uncover the finer details of an experience, of which, based on a suitable instruction to a participant, one would have good reasons to believe that it was an instance of this or that kind of experience actually lived through by the participant in the experimental situation.

The phenomenological descriptions provide conceptually based constraints for the empirical work by making *explicit in advance* what is only implicit in the pre-reflective natural consciousness of participants. Probably the main advantage of this proposal is that detailed research questions concerning distinctly different ways of being conscious can be addressed using all available third-person methods *without interfering* with either participants’ performance or the very collection of third-person data. Note the crucial difference between, on the one hand, a participant’s actively being involved in a conscious experience of one kind or another – say, an experience of viewing a picture of object *x* (formula (3), above) or an experience of forming a mental image of a picture of *x* (formula (4c), above) – and, on the other hand, a phenomenologist’s reflectively describing the very structure of such an experience with the tools of the phenomenological methodology. Whereas the phenomenologist’s job can be done prior to, and in fact quite independently of, a given experimental situation, the participant’s conscious experiences will actually be lived through, but not reflected upon, while *simultaneously* being monitored and measured with the help of third-person methods of brain imaging via fMRI and PET technology, single-cell recordings through insertion of electrodes, surface recordings through EEG and MEG, etc.

A further advantage of the present proposal, besides avoiding impeding interferences with participants’ performance and data collection, consists in making *replications* of the experimental situation readily available. Moreover, perhaps in connection with replications, new questions regarding further details and refinements of a conscious experience may come to the fore, regarding, for example, participants’ shifting attention, following a suitable instruction, from intentionally referring to object *x* to referring to its way of appearing in a picture, or participants’ consciously modifying a belief-attitude to an attitude of merely imagining something, etc. Furthermore, the first-person structural knowledge concerning consciousness that Husserlian phenomenology is able to provide should also lead to more refined third-person data connected to layers involved in participants’ re-presentational experiences (first-order, second-order, etc.) and to their lawful dependencies.

Last but not least, the phenomenological clarifications and conceptual constraints, so different from more or less personal reports about one’s experiences, should of course be combined with other available methods and measures

– thus, no doubt, *also* with participants’ retrospective reports about what they had been doing during the experimental situation. At any rate, trying to establish a scientific study of *consciousness* should no longer be undertaken while ignoring the potential of the Husserlian method of phenomenology. With its help, there is a fair chance that the “major programme for 21<sup>st</sup> century science”, that Chris Frith (2002) evokes, “to discover how an experience can be translated into a report, thus enabling our experiences to be shared”, will get closer to its realization.

## APPENDIX

A brief survey of the elements of the phenomenological notation:

Triplets of upper case letters serve to designate mental activities; thus ‘PER’ for the activity of ‘perceiving’, ‘REM’ for ‘remembering’, ‘IMA’ for ‘imagining’, ‘PIC’ for ‘picturing’, ‘PRE’ for ‘presenting’, ‘REP’ for ‘re-presenting’.

Lower case letters (‘x’, ‘y’, ‘s’) designate intentional objects, i.e. objects reflectively considered as correlates of mental activities. In the present context, the value range of ‘x’ etc. is any individual, spatio-temporally located object, situation, event, considered as correlate of a mental activity.

A pair of parentheses, ‘(.....)’ together with ‘x’ etc., is used to designate the reflective finding of the *intentional correlation* between an *actually* occurring mental act as a whole and its object(s). Thus expressions such as ‘(PER)x’, ‘(IMA)x’, etc. designate the fact that an actually occurring perception, imagination, etc. has x as its intentional object or correlate. These act-wholes are to be reflectively analyzed in terms of phenomenological forms or structures of presenting and re-presenting the intentional object.

Pairs of square brackets, ‘[.....]’, surrounding expressions for mental activities and put *inside* the expressions for the act as a whole surrounded by parentheses, designate the reflective finding of an occurrence of an *intentional implication* or *modification* of a mental activity contained within another activity. Crucially, the expression of an activity surrounded by such brackets is meant to be indicative of the fact that such an intentionally implied activity is involved in the mode of non-actuality; it is no longer actually performed but is, precisely, experienced as being only re-presented in one way or another in my actually re-presentationally referring to an object. Thus, the expression

‘(REP [PER])x’

designates the reflective finding that the actually occurring re-presentational act in its intentionally referring to x implies within itself a non-actual activity of perceiving x. Forms of re-presentational experiences, (REP)x, relevant in the present context are IMA, REM, PIC, and combinations thereof; they all intentionally imply one or more activity of perceiving in ways further to be specified.

A horizontal stroke, ‘\_\_\_\_\_’, called “foundation-stroke”, serves to account for the reflective finding that all re-presentational experiences involve a simultaneously occurring presentational experience on the basis of, and in contrast to, which one’s intentionally referring to something re-presented takes place; the compound expression is set in subscript position: ‘\_\_\_\_\_’.

(PRE)<sub>s</sub>

In addition, this stroke also serves in cases where a re-presentational experience involves a simultaneously physically present or re-presented carrier or foundation for the re-presentative function, such as in cases of picturing something. Thus, an expression such as

$$\left( \frac{\text{REP} - \text{[PER]}}{\text{(PER)}} \frac{x}{y} \right) | x$$

designates part of the form of the mental activity of pictorially re-presenting some x that is grounded in a simultaneous perceiving of the picture (carrier) y, in which the x appears. The vertical stroke ‘|’ between ‘x’ and ‘x over y’ is used to capture the finding that, with (PIC)x, intentional reference is made to a peculiar “double object” (i.e., the depicted real or fictional x just in so far as it appears in the physical picture y as pictorial object ‘x over y’).

A sign of the form ‘┌’, called “belief-stroke”, when put in front of a pair of brackets, serves for expressing the fact that a re-presented mental activity is experienced with the force of “belief”

(or “positionality”), and when put in front of the symbol for the intentional correlate, that it is taken for something in the real world.

On the other hand, a sign of the form ‘-’, called “neutrality-stroke”, serves for indicating a conscious operation of neutralizing, i.e. of suspending one’s belief, either with regard to an activity or to an intentional object.

Where necessary, the letter ‘i’ will be written at the very beginning of a formula to designate the I-awareness that is involved in an experience.

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**Eduard Marbach**

### **Zu einer Integrierung der Husserl’schen Phänomenologie mit der kognitiven Neurowissenschaft des Bewusstseins**

#### **Zusammenfassung**

*Dieser Beitrag beginnt mit einigen allgemeinen Anmerkungen zur Husserl’schen philosophischen Phänomenologie mit Blick auf ihre Verknüpfung mit der wissenschaftlichen Erforschung des Bewusstseins, wobei auf einige methodologische Grundsätze der Husserl’schen Phänomenologie des Bewusstseins zurückgegriffen wird (I). Sodann verweist der Autor auf einige jüngere Arbeiten über das sog. „geistige (bildhafte) Vorstellungsvermögen“ in der Kognitiven Psychologie und der Neurowissenschaft (II). Es folgt eine detaillierte reflektive Analyse von Bewusstseinsenerfahrungen, die auf geistigem Vorstellungsvermögen oder geistigen Bildern beruhen (III), wobei die These vertreten wird, dass reflektive konzeptuelle Klarstellungen solcher Formen der Erfahrung zu deren vertiefter Erforschung beitragen können. Um genauer zeigen zu können, dass Bewusstseinsenerfahrungen, die den Gegenstand zeitgenössischer kognitiver und neurowissenschaftlicher Forschungen über das Vorstellungsvermögen darstellen, in der Tat eine andere Struktur aufweisen, verwendet der Autor einfache Formeln zur Darstellung der verschiedenen Strukturkomponenten der untersuchten Erfahrungen. In seiner Schlussbemerkung (IV) unterstreicht er bestimmte methodologische Vorzüge, die den neuerdings vorgebrachten Vorschlag betreffen, die Methode der Husserl’schen Phänomenologie einzubinden in die zeitgenössische Forschung und, mehr noch, in das zukünftige Studium des Bewusstseins.*

#### **Schlüsselbegriffe**

Bewusstsein, Husserl’s Methodologie, Kognitive Neurowissenschaft, Erste- und Dritte-Person-Daten, geistiges Vorstellungsvermögen

**Eduard Marbach**

### **Vers l’intégration de la phénoménologie husserlienne dans les neurosciences cognitives de la conscience**

#### **Résumé**

*L’article présente d’abord quelques remarques d’ordre général sur la phénoménologie philosophique de Husserl afin de les relier à l’étude scientifique de la conscience et de rappeler quelques-unes des doctrines méthodologiques de la phénoménologie husserlienne de la conscience (I). Le texte expose ensuite quelques travaux récents relevant de l’approche dite de l’« imagerie cérébrale » dans les domaines de la psychologie et des neurosciences cognitives (II). Ensuite, un exposé détaillé d’une analyse réflexive des expériences conscientes, impliquant l’« imagerie » ou des « images » (III), affirme que les clarifications conceptuelles et réflexives des différentes formes de ces expériences pourraient contribuer à les explorer plus en détail. Afin de démontrer plus précisément que les expériences conscientes, impliquées dans la recherche de l’imagerie cognitive et neuroscientifique contemporaine, sont effectivement structurées différemment, une simple notation sera utilisée pour décrire les différentes composantes structurelles des expériences en cours d’étude. La conclusion (IV) souligne certains points méthodologiques concernant la proposition actuelle d’intégrer la méthode de la phénoménologie husserlienne dans l’étude contemporaine, en espérant qu’elle le sera encore davantage dans des études futures.*

#### **Mots-clés**

conscience, méthodologie husserlienne, neurosciences cognitives, données à la première personne, données à la troisième personne, imagerie mentale