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The Bounds of Naturalism: A Plea for Modesty

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Résumé : Nous reformulons la question du naturalisme sur le terrain de la pratique scientifique en privilégiant une analyse épistémologique fine des méthodes, procédures et concepts employés en psychologie. L'enjeu devient alors opérationnel : celui de la mise en place d'un cadre exact et expérimental permettant de rendre compte de la phénoménologie de l'expérience.

Abstract: We reformulate the issue of naturalism within the realm of scientific practices by suggesting that a fine-grained epistemological analysis of the methods, procedures and concepts of psychology is needed. The outcome of this attempt turns out to be operational as it concerns the construction of an exact and experimental approach that allows one to account for the phenomenology of mental states and processes.

1 Introduction

The articles published in this volume of *Philosophia Scientiæ* address specific issues in contemporary psychological research. They have been collected with

a singular purpose in mind. The editors share the conviction that the discussion of tangible research problems ranging from methodological challenges to epistemological riddles is a more solid foundation for the examination of various aspects of naturalism than simply adopting one of the many stances from contemporary philosophies of cognition, general body-mind theories or what is often referred to as classical (philosophical) phenomenology.

Some of our authors focus partly on the history of modern psychology, while others draw, more or less freely, on fragments of Gestalt theory or disparate phenomenological insights but none of the subsequent articles derive their key arguments directly from a specific school of thought, be it philosophical or psychological. Instead, crucial questions concerning various facets of naturalism are raised from discussion of factual research situations. These are questions which demand specific answers, or at least the outline of such answers.

A rapid "scan" through the essays selected for the present issue is likely to be misleading or deceiving. The topics chosen by our authors may appear similar to those conventionally dealt with in academic philosophy, but any mere appearance is where similarities end. Notwithstanding *prima vista* impressions, these contributions do not elaborate on diverse matters such as first person reports, the units of sensory experiences, the impact of judgmental fallacies, etc., in strict continuation with philosophical discussions (e.g., whether phenomenology exists,[1] whether *qualia* are constitutive of the human mind, or whether the human mind needs to be accounted for essentially in terms of computation or Turing machine states run by clever algorithms). This issue is not the place for debates about grand philosophical theses; nor is it a public arena where one can observe how an author follows the lead of Daniel Dennett, for example. This scholar once asserted that, since he was a "philosopher, not a scientist", he was also "better at questions than answers" [Dennett 1996, vii]. Yet, despite limiting himself to questions, his intention was also to positively and unquestionably "introduce the set of fundamental assumptions that hold my way together and give it a stable and recognizable pattern" [Dennett 1996, vii]. Our authors refrain from smartly constructing whole philosophies held together by similar fundamental assumptions. They prefer instead to tackle problems confronted in, and by, empirical and experimental enquiries into human mental states and processes of the most variegated kinds.

1. See, for example, the controversy on phenomenology and the human mind in letters sent to the editors of the *Times Literary Supplement* and partly published in n° 5843, dated 27 March 2015, p. 6. Note also the remarks sent by Rowland Malony from Beer (Devon), one of the TLS's readers, made public on the same page, relating to this and similar philosophical controversies: "Entertaining for the rest of us though it is, reading philosophers swatting at each other in your letters page is no great advertisement for the subject, is it? Would it help if they agreed to make the acquisition of wisdom and the dissolving of ego the pursuit in future?"

2 Reorientating the naturalism issue from an interdisciplinary perspective

Consequently, the question of whether naturalism should be adopted as a viable research program *within philosophy*—conceived as a *distinct* academic discipline—is clearly not our immediate concern here. In his 1955 presidential address to the American Philosophical Association, Ernest Nagel already declared that "the number of distinguishable doctrines for which the word 'naturalism' has been a counter in the history of thought is notorious" [Nagel 1955, 3]. Despite a half century of intense technical debate, the meaning of naturalism remains quite equivocal, and as David Papineau recently admitted, "[t]he term 'naturalism' has no very precise meaning in contemporary philosophy" [Papineau 2007]. The difficulty of firmly determining what philosophical naturalism is supposed to be or what naturalism really means to philosophy requires us to doubt its ability to *properly* address *what is really at stake* in naturalism. Given that naturalism can be understood, interpreted, and defended in several ways [Andler 2009a]—even within the realm of cognitive studies and especially in the philosophy of mind—one is entitled to ask whether the variety of naturalistic interpretations of mental states and processes results from philosophers' temptation to above all satisfy their own interest in speculation and abstract conceptualization. This applies especially to the body-mind problem, which still represents the core issue in philosophy of mind. In the attempt to explain, *by the way of a priori reasoning*, how the mind *in general* is an integral part of the real nature, philosophers have carefully, deliberately and with great conceptual sophistication outlined abstract ontologies of body-mind relations (reviewed, e.g., by [Kim 2011] and [Mandik 2014]). This slippery slope of overconceptualization has revealed an autarkic or disconnected way of thinking with respect to a genuine naturalistic approach implying involvement with the sciences themselves.

A philosopher of mind could of course argue that: (argument 1) philosophy is the right sphere for dealing with naturalism rather than science, since by vocation it is concerned with highly theoretical, meta-scientific issues, and that (argument 2) the increasing shift from an ontological to a methodological naturalism (see [Haug 2014] for recent debates) is intended to overcome suspicions that philosophy (and essentially the philosophy of mind) will inevitably succeed regardless of the course taken by the sciences.

Argument (1) reveals a misestimation of the conceptual resources of scientific practice. These conceptual resources are actually stronger than is usually admitted by professional philosophers, which suggests that there is no need for philosophical help to begin with (contrary to [Thagard 2009]). If experimental and other research practices cut themselves off from theoretical issues, they risk turning into a blind and guideless data-gathering exercise. Scientific achievements, the establishment of local frameworks and the emergence of global research paradigms are all efficient remedies against the prejudice that

science has neither a normative nor a general dimension without the assistance of philosophy.[2]

If, according to argument (2), one admits that, until more or less recent times, philosophy was extensively nourished by scientific practices—and thus deeply rooted therein—and if one recognizes that philosophers currently call for a return to the previous conditions of philosophical practice, then one cannot avoid challenging the existence of a dividing line between philosophy and science. Roberto Casati illustrates this trend when he asserts that:

> If philosophy is pervasive and continuous with non-philosophical disciplines, if consequently this dialogue is above all highly interdisciplinary, [philosophy] tends to align itself with the standards of scientific disciplines, and generates strongly contextualized and localised philosophical problems. [Casati 2006, 27]

However, it is not an easy task to provide an accurate description of what non-reductive alignment with, and contextualization within the sciences entail and how philosophico-scientific interactions might yield productive or even innovative results. Whatever the outcome, the reconstruction of philosophy along the line of its interactions with the sciences has certain far-reaching consequences for the present issue.

Concerning the impact of philosophy, it would be nonsensical to grant a privilege to philosophy *in and by itself* when considering problems of naturalism. Indeed, whatever the *consequences* for the alleged foundational ontology of mind and the so-called "naturalistic philosophy"—given that such perspectives are usually a matter addressed by philosophical circles only—, naturalism *primarily* concerns epistemological and methodological issues *in the sciences*. These issues may of course be addressed either by philosophically minded scientists or by scientifically informed philosophers.[3] The editors of the present issue of *Philosophia Scientiæ* share the conviction that philosophers *of science*

2. [Wagemans, Feldman *et al.* 2012] give a good illustration of what we have in mind here with regards to our current issue on psychological research. See also the research program initiated and headed by Johan Wagemans at `www.gestaltrevision.be/en/`. Another example in the field of neuroscience can be found in [Mausfeld 2012].

3. This integrative approach to the mind-body problem has also been recently illustrated in a previous issue of the present journal, see [Vacariu & Vacariu 2013]. See in particular the articles [Rolls 2013] and [van Leeuwen 2013] for the first category and [Bechtel 2013] and [Theurer & Bickle 2013] for the second. Bechtel and Bickle are among the main flag-bearers of the emerging research subfield labelled "the philosophy of neuroscience" which promotes a more scientifically oriented approach to the philosophical analysis of the mind-body problem (see, for instance, [Bechtel, Mandik *et al.* 2001] and [Bickle 2009]).

are better equipped to perform this task than any philosopher of mind in the traditional (and academic) sense of the term.[4,5]

Though we are here concerned with psychological research, it would still be misleading to talk about the "philosophy of psychology" rather than about the "philosophy of science". Indeed, the label "philosophy of psychology" refers to something that has little to do with the working practices of scientific psychologists. Gary Hatfield is among the few authors to have noticed this discrepancy:

> If the truth be told, though, much of what goes under the title of "philosophy of psychology" has only a tenuous relation, if any, to actual scientific psychology. In some cases this arises innocently and understandably from the equivocal use this label permits: some philosophers use the title "philosophy of psychology" as a catch-all for problems in philosophy of mind. In other cases, philosophers have appealed to results in scientific psychology to speak to questions in metaphysics, epistemology, philosophy of mind, and even philosophy of science, without making psychology an object of analysis in its own right. [Hatfield 1994, 19]

Bermudez provides a paradigmatic case of this misleading conception when he declares that "the philosophy of psychology is the systematic study of the interplay between philosophical concerns and psychological concerns in the study of cognition" [Bermudez 2005, 2]. According to this commonly shared view, the core issue is about the relation between commonsense psychological explanations and explanations from scientific psychology. This, of course, presupposes a broader conception of psychology than the one available in scientific psychology as such. Needless to say that, regarding the constant involvement of philosophy in the course of the long history of scientific psychology [Hatfield 2009, part III], one should be skeptical about the relevance of such a historically and disciplinary disconnected conception of psychology. Following Lawrence Shapiro's ironical remark, "many of the issues that Bermudez [...] [among many other authors] believe[s] to be central to philosophy of psychology would be alien to psychologists [...]" [Shapiro 2010, 793]![6]

4. Concerning the misguided nature of current debates in philosophy of mind and the need for fresh start from a more appropriate philosophy of science, see [Horst 2005, 2007].

5. [Bechtel 2009, 565, note 2]: "As philosophers of science engage particular sciences, they often [...] engage in the theoretical issues arising in the science." Even though the same author also shares a quite optimistic view on the philosophy of mind's ability to have some "potential [!] importance" to cognitive science, see [Bechtel 2010].

6. This remark about philosophy of psychology can be extended to the entire field of the philosophy of cognitive science as well. We should probably prescribe the same remedy: "In short, philosophy of cognitive science can also, and perhaps should, be thought of as a division within the philosophy of science, on par with philosophy of biology, philosophy of economics, etc. This may seem obvious, but it is not how it is usually treated" [Andler 2009b, 256].

But to be quite honest, it must be admitted that the radical significance of the proposed reorientation on philosophy is rarely assumed in its entirety, even by promoters or supporters of this integrative approach. For example, in the introduction of his *Philosophy of Psychology and Cognitive Science*, Paul Thagard does agree with Hatfield's diagnosis while trying to reinvigorate the lost but senseful understanding of the label "philosophy of psychology". When he states that "[t]he philosophy of scientific psychology must be distinguished from enterprises that have been popular in philosophy: 'philosophical psychology' and armchair philosophy of mind", no doubt that he clearly intends "to sharply distinguish philosophy of psychology and cognitive sciences from approaches to philosophy of mind that attempt to ignore scientific developments" as well as from the fake philosophy of psychology. But he doesn't seem to *fully* assume his view when he brings this further precision:

> The point of philosophy of psychology is [...] to deal with philosophical issues through close attention to developments in scientific psychology. [Thagard 2007, X]

This means, ultimately, that philosophy retains the priority in its own questioning while science can be used as a filter for philosophical questions or, at best, as a means to obtain more satisfying answers. But, if one agrees that philosophy is not inherently different from science and if the proper goal of philosophy of psychology "is not to develop conceptual truths about the mind", as Thagard rightly puts it himself, why should we continue to posit some pre-existing *intrinsically philosophical* issues that are not, in the first instance, interrelated to, motivated by, and raised in scientific ones? In what sense and to what extent do philosophical issues have to be distinguished from scientific developments?

It is not a question here of reducing philosophy to science but of recognizing their true functional interdependence in one way or another (even though some asymmetry actually remains in knowledge-producing) and at the outset of any research. Pretending to keep a close contact with sciences by picking up some ready-made results, artificially importing some experimental methods for purely philosophical purpose still makes philosophy of psychology an armchair discipline despite appearances.

Our approach may appear to unfairly misread or even distort the philosophy of mind's official program. For example, Pete Mandik states that:

> Philosophy of mind has also enjoyed prominent interactions with various empirical sciences in recent debates, especially through interdisciplinary interactions with the cognitive sciences. Thus much recent work in philosophy of mind has been informed by (and to some extent, has informed) advances in psychology, linguistics, artificial intelligence, neuroscience, and anthropology. [Mandik 2010, 1–2]

Yet, in our view, what is emphatically called "interdisciplinary interactions" does not go beyond a *flatus vocis* if these interactions consist of one-side (inter)actions. Surely it is more than a rumor that philosophy of mind is at best more informed by the sciences than the reverse. Methodological naturalism, as a theoretical tenet, is more "scientifically" informed and discipline-oriented *towards philosophical issues* than philosophically-minded with an orientation towards the sciences. Once more, it may be thrilling to use the sciences as a source of inspiration in the pursuit of philosophical goals for their own sake, but it seems even more thrilling to engage in permanent transactions with the sciences and thus engage in research which does not lose contact with the practices of scientists. In any case, our authors have greatly benefited from what was, and still is, happening *within* the realm of the sciences, thus attributing more weight to the problems faced by empirical and experimental research than to a specific philosophical agenda, whether scientifically informed or not.

Two examples (which are incidentally also interrelated) seem to illustrate the approach which prevails in the present collection of essays.

3 What is psychophysics really about? Sketch for a semantic analysis of sensation

Ever since the end of the nineteenth century, we have repeatedly heard that scientific psychology—the science established in laboratories, the psychology which proudly opposed the old armchair psychology, the fruit of thinkers who believed themselves to be amply equipped to explore the dark continents of the human and, occasionally, the animal mind—draws its high epistemic status from psychophysical theorems set forth by Gustav Theodor Fechner. There is much truth to this well-worn assertion. Fechner provided hypotheses which enabled the experience of sensory impressions to be referred to the purely material sphere and the relations between stimuli and sensations to be determined in mathematical terms and thus to reach a level of articulation which previous savants like Immanuel Kant thought to be metaphysically impossible. It is certainly no longer strange to talk of psychophysics as a perfectly well-accepted branch of research. The founding of *The International Society for Psychophysics* in 1984 and the annual *Fechner Day* held over the past thirty years[7] are further evidence that this tradition is still alive and well.[8]

However psychophysics, in its commonly known version (i.e., as a subject matter taught in lectures and seminars offered in colleges and universities), only represents part of the original paradigm developed by Fechner. There is

7. See http://www.ispsychophysics.org/.

8. In the introduction to his handbook, Christian Bonnet asserts that "the questions raised by Fechner are still hot topics for current research" [Bonnet 1986, 9].

no doubt that post-Fechnerian psychophysics underwent subtle adjustments and that the relations between stimuli and sensations have been further investigated in a way that he could hardly have anticipated. But this physicist originally outlined an *outer* as well as an *inner psychophysics*. Outer psychophysics covers that which one now commonly subsumes under the denomination of "psychophysics", while inner psychophysics, in contradistinction, has been simply pushed out of sight. There remains practically no trace of it in the collective memory of today's psychology communities, except in the form of a mere psycho-physiology.[9] This part of the Fechnerian research program was intended to precisely determine the relations between internal (or neural) stimuli and *lived sensations*. Therefore, this kind of study was initially far from being circumscribed to the mere investigation of the relation between neuro-electric responses and the intensity of sensation as is often believed when this section of Fechner's program is deemed worthy of mention. It originally took *psychological* processes into account and not just their physiological and anatomical counterparts [Fechner 1860, 11], [Fechner 1877, 3].[10]

Does it really matter, however, whether Fechner's initial research program was forgotten [Scheerer 1987] after having been cut in two? Does it really matter, considering the fact that one half of it not only promoted relevant theories, but also proved to be acceptably successful for nearly a century and a half? It certainly does not matter to those who unknowingly mistake one half of the research program for the entire project.[11] It would, however, matter to those who prefer not to easily stick with the everyday habits of normal science and who have enough curiosity to ask questions like "What's the equivalent of a physically defined stimulus of the outer world for a stimulus—let's say: of proprioceptive origin—considered from the point of view of inner psychophysics?" Moving beyond normal psychophysics to study sensations which are the result of *some kind* of physical stimulus, but certainly, as is the case with phosphenes, *do not relate to outer stimuli*, e.g., unabsorbed lightwaves, compels us to deal with specific problems of methodology, experimentation

9. For a short presentation of Fechner's inner psychophysics and its relevance for current cognitive sciences, see [Scheerer 1992]. Murray's attempt to show the existence of a line of research from inner psychophysics to modern signal detection theory should also be mentioned [Murray 1993], though this attempt is rooted in a rather vague historical narrative allowing for many approximations (see [Gundlach 1993b] for critical comments).

10. For further developments on Fechner's psychophysics *as a whole project*, see, if not exclusively, Gundlach's incomparably well executed historical and epistemological account of Fechnerian psychophysics [Gundlach 1993a].

11. Furthermore, what is now meant by "psychophysics" refers more to a mere set of techniques integrated to experimental psychology and sensory physiology than to a genuine discipline (see [Farell & Pelli 1999] and [Ehrenstein & Ehrenstein 1999] for reviews). In short, the modern psychophysical approach follows at least these two criteria: careful experimentation (controlled stimuli, reliable task) and data analysis (psychometric functions, statistical tools).

and measurement which are usually ignored in normal post-Fechnerian psychophysics, if we discard their dilution into mere physiological investigations.

Yet, there is no need to look back to the era of Fechner and some of his early followers to notice that normal, conventional (i.e., outer) psychophysics is unlikely to address the totality of the phenomena it claims to explain. The starting point of outer psychophysics is the correlation between physical stimulus and sensory response but physical stimulus does not cover all of *what is perceived*—it is clearly difficult to consider bistable or multistable phenomena from a purely psychophysical point of view:[12] there is a perceptual variation which does not rely upon a correlative variation in physical parameters.

Let us take, for example, the unsurprisingly trivial experience one undergoes when contemplating reversible figures like the Necker cube or Rubin vase, also known as the Rubin face (see figure 1).[13] Here is a description of what happens (realistically) when one looks at the Rubin face/vase figure under constant external conditions (with no increment of luminosity occurring). One perceives either a vase against a black background or two faces in profile facing one another on two sides of a white background. In addition, the perceived content of the same surface reverses from one "meaning" to the other "meaning", i.e., from opposite faces to vase, or *vice versa*. Moreover, when we carefully look at what happens in the course of this visual experience, it clearly may be fairly difficult to stop the figure from reversing automatically. It seems as if the figure has reversed under the impact of some physiological agent unbeknown to the subject.

According to classical theorems drawn from Fechner's *outer* psychophysics, reversible figures should be ontologically barren from occurrence. Indeed, the stimulus remains the same throughout the experience of the Rubin face/vase figure. Hence, the sensation should in turn remain the same, too. This kind of paradoxical experiential and experimentally tested outcome ought to be taken seriously at face value and received as a welcome opportunity to reconsider certain significant semantic and epistemic issues in psychological research.[14]

12. See [Strother, Van Valkenburg *et al.* 2003] and [Kubovy & Gepshtein 2003] for reviews of Michael Kubovy's decisive works on that issue.

13. For further details on Rubin's approach, see [Rubin 1915]. [Pind 2014, 90–109] has recently presented in English the main results of Rubin's doctoral dissertation.

14. Let us note that the figure/ground assignment remains a hot topic for *experimental psychology* which has, until now, analyzed the relevant perceptual grouping cues to include symmetry [Bahnsen 1928], parallelism [Metzger 1936], convexity [Kanizsa & Gerbino 1976], edge-region grouping [Palmer & Brookes 2008], extremal edges [Palmer & Ghose 2008], etc., i.e., cues which are said to determine the figure/ground organization. In addition, experimental psychology studies the impact of lower-regions in a visual scene [Vecera, Vogel *et al.* 2002] upon the figures so that they appear phenomenologically closer to the observer, or the top-down influence of higher-order processes (such as object-recognition and attention) on figure assignment (see [Rock 1975], [Peterson 1994] and [Peterson & Gibson 1993]) to mention only some examples of more or less current research.

FIGURE 1: A Rubin-type reversible figure

The sketchy reconstruction of the case of Rubin's reversible figures draws our attention to one concept of psychological research, namely the concept of sensation. The concept of sensation is highly controversial in the history of psychophysics. But it seems hard to discard sensation from psychophysics without compromising its psychological relevance (see [Shapiro 1994]). Viewed in terms of the traditional approach to psychophysics, seeing two faces and then seeing one vase (or *vice versa*) reflects a theoretically paradoxical situation, since a constant stimulus cannot be the cause of two distinct sensations. But, conversely how could a single, stable, and unchanging stimulus provoke two distinct, and distinguishable, sensations? If we closely consider the high frequency of reports on subjects who see two faces and/or a vase (while figure and ground reverse depending on whether you see a vase or two faces first), we could alternatively hypothesize that the stimulus (the whole figure with its physical parameters objectively presented to the subject) remains constant while the sensation (i.e., the psychologically relevant state called "sensation" in traditionally taught psychophysics) presents either two faces or a vase. This evidence is doomed to remain a mystery if *that which is perceived* is reduced exclusively to the *physical* parameters of the one, unchanging stimulus. The investigation of phenomena requires that a distinction be made between (a) *the object* of sensations (such as the figure presented to the subject with all its physical, purely objective, neutral or subject-independent properties) and (b) *the content* of sensations (such as the figure of a vase or the figure of two faces as perceived by a subject and phenomenologically grasped with no consideration for the subject's assumptions concerning the realness of the properties of the object at stake). The paradox of reversing sensations (in terms of post-Fechnerian psychophysics) may thus be due to a definition of "sensation" which is either too loose or broad and thus implies that whatever one sees, hears, smells, feels by touch, etc., is conventionally subsumed under the term. This is despite the fact that so-called "sensations" may be quite diverse insofar as they are (a) *considered from a purely objective or idealised standpoint* (as if our sensory states can be strictly correlated to some determined and constant physical features of the stimuli) and (b) insofar as they are *being*

experienced by subjects. In other words, traditional psychophysics, as received and enlarged by post-Fechnerian scholars, may cause all sorts of problems for itself. It is likely, indeed, that it confounds *that which it unravels by methodically organized research acts* with *the fully-fledged thing it intends to unravel*.[15]

4 The phenomenological requiredness: a scientific concern and prospect

However, phenomena such as following the movements made by afterimages in one's visual field, perceiving first a vase and then two faces (or *vice versa*), seeing phosphenes in an absolutely dark room, noticing auras at the onset of migraines, or feeling different kinds of pains in one's forearm or in the abdomen, are too intrinsically bound to one's own streams of perceptual experience to fit any *a priori* framework, be it philosophical or not. These phenomena are observable only to the person who "experiences" them, to put it crudely. They occur inside the subject, whereby the word "inside" is both used metaphorically and in a possibly misleading way. The least one would have to acknowledge, however, is that these phenomena, if made the content of propositions, are uttered, expressed and possibly described in first person reports. These reports may turn out to be insufficiently concise (a subject may correct her/himself while thinking twice about the phenomenon at stake), and yet, due to their reference to the stance "from within", they have to be taken into account for what they are—a source of first-hand distinctions between various kinds of mental states that one lives through, sometimes against one's will (as with patches of itchy skin) and which sometimes become the focus of sustained attention (as has often happened in experimental studies of afterimages since 1750).

Research in psychology cannot (or rather must not) ignore subjects noticing, perceiving, feeling and perhaps suffering pain. For without the study of such experiences, we would not sense what it is like not to be someone else. However it would be an error to infer from this assumption that one's own perspective on one's "inner" mental life will yield genuine psychological knowledge under any circumstance. Some exercises in introspection quickly show with a high degree of reliability that some mental states and/or processes are easily graspable, whereas other such mental states and/or processes tend to remain indiscernible notwithstanding the efforts of self-observation undertaken by subjects. Let us return to the example of the Rubin vase. Does the black part of this figure cause one or several sensations? Should one identify what one perceives as the black and the white parts of the figure with two

15. We here overtly allude to a passage of Theodor W. Adorno's introduction to the sociology of music: "one realizes that the division of scientific labor causes the "Verwechslung des methodisch Veranstalteten mit der Sache selbst [...]" [Adorno 1973, 397].

distinct visual impressions or several of the same or should one say perhaps that there is a set of fuzzy single impressions which combine into a figure? If we consider either of the two faces then the nose is easily distinguishable from the mouth. But, do we now have two elements of a profile, or do we rather see a nose and a mouth which, in turn, are made of little bits of a nose and fragments of a mouth, respectively. And what about the dozens of feelings, moods, and similar states of mind which appear hard to characterize with the sufficient precision a subject either desires or is required to attain by a physician, psychotherapist or judge?

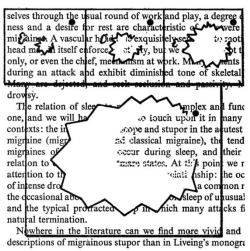
Being aware of one's mental states and processes needs to be characterized epistemologically as a key to psychological research. Yet this key alone is by all means far from being sufficient. The character of reports of mental states and processes is both an unsettled and an exciting challenge. Indeed, what do psychologists study when using, for example, first person reports on sensory experiences? Do they confront sensory data rather than linguistic data, which refers to subjects' having perceptions? To what extent a psychologist is committed, in a way or another, to the language of perception? On the contrary, should he/she reduce the verbal report, as far as possible, to a yes/no response, in order to get the unbiased and online process by which the subject is performing the task? Are psychologists capable of solving the problem of disentangling the content of first person *reports* on sensory data, on the one hand, from the *content* of *sensory data* as experienced by subjects, on the other? If, for whatever epistemological reason, we assume that we cannot do without first person reports to begin with, the problem at hand seems to be intractable without other strategies enabling researchers to move beyond such reports on sensory perception—and on other so-called "private" mental states and processes, like pain, itches, dreams, etc. (we readily admit that the adjective "private" is most likely a misnomer).

Hence, since most mental phenomena experienced by subjects are neither self-explicatory nor always fully graspable, and since such lacunae often do not escape the observation of subjects themselves,[16] psychological research needs to *coordinate phenomenal experiences* with *research methods of various kinds*—be they physiological, psycho-somatic, social psychological, and so on. This kind of coordination (past and present) is the key topic of the papers collected for the present issue.[17]

16. [Schumann 1900] indicates how useful self-observation can be, as a research method, to discover new effects or phenomena. But he also recognizes how difficult it is to find observers with such a fine and accurate ability. Furthermore, one must admit that some phenomenal concepts are intrinsically hard to describe by themselves, as it is the case with "the visual field" (see [Koenderink, van Doorn *et al.* 2015]).

17. See also [Ehrenstein, Spillmann *et al.* 2003] and [Spillmann 2009] on the relation between phenomenology and neuroscience, and [Pinna 2010] for a mutual enlightenment between phenomenology and outer psychophysics. We set aside the question whether or not a descriptive (pre-)science (?) (such as experimental phenomenology) can also explain—and not only describe—the modes of appearing of perceptual phe-

A single example may illustrate the overall approach focused upon here. Take the commonly reported, examined, and diagnosed phenomenon of negative scotoma in migraines. This consists of an "area of partial or total blindness which may follow, or, on occasion, precede a scintillating scotoma" [Sacks 1971, 79]. This phenomenon is no doubt accessible to the person experiencing it because (trivially) otherwise it would not be noticed. In addition, it is topic of many first person reports. Given medical, paramedical, and everyday encounters with migraines in various individual and social contexts, these first person reports are easily turned into third person reports. The phenomenon itself has been selected (and continues to be selected) as a topic of hot medical research.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and the typical protracted ... hich many attacks fi
natural termination.
Nowhere in the literature can we find more vivid and
descriptions of migrainous stupor than in Liveing's monogr

FIGURE 2: Variants of migraine scotoma. From: [Sacks 1971, 78]

Though avalanches of scotoma-linked visual sensations may vary from person to person, in principle at least they are suitable for iconical typification and representation as an illustration in Oliver Sacks's monograph on migraines clearly shows (see figure 2).

Migraines are examples of the undeniable feeling of something wrong more often than not combined with a temporal and intermediate acceleration of peristaltic movements, spasms, decreasing or increasing secretion, an unstable and fluctuating nervous system, and varying degrees of headache. The scotoma, whether scintillating or negative, thus turns out to be embedded in a huge number of organic processes which extend, so to speak, from the skin to the belly to the eyes and the whole nervous system. Given such all-encompassing bodily conditions, it would certainly be an epistemological error to reduce the mental phenomenon of a scotoma either to how it is described as an experience ("private" in nature, seeing scintillating or more or less enduring blind spots in one's visual field) or to systematically discard that which is accessible only to the experiencing person.

However this example of course does not mean that *all* mental states and processes are suitable for the same types of first and third person reports, the

nomena. This strategy has been promoted by [Metzger 1936, 1941], [Kanizsa 1980, 1991], [Bozzi 1989], [Bianchi & Davies In preparation], [Vicario 1993], and more recently [Albertazzi 2011, 2012, 2013].

same experimental designs developed for further studies, the same explanatory schemata and the same patterns of psychological theories.

The approach that we prefer to adopt, then, in studies of regional or even local epistemology is to take single cases of psychological research as a starting point for study of the methods used in field and lab experiments and the critical determination of which kinds of concepts are at stake.

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