

An Introduction to the Enactive Scientific Study of Experience

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> Context • The enactive approach to cognition affirms the relevance of the study of lived experience within cognitive science. **> Problem** • Taking experience as the phenomenon of investigation, while at the same time recognizing it as a necessary medium of any scientific activity implies theoretical, epistemological, and methodological challenges that have to be addressed in order to undertake the scientific study of experience. At the same time, it calls for a development of an alternative, non-objectivist and non-representationalist framework for and by addressing those challenges. **> Method** • After presenting the development of the idea of cognition as enaction and pointing to its consequences for the understanding of science, we situate the scientific study of experience within the enactive approach, presenting neurophenomenology as the methodological implementation of the enactive framework that motivated the development of first-person methods. We distinguish the micro-phenomenological interview and descriptive experience sampling as examples of such methods, reviewing their distinctive features. **> Results** • Understanding first-person research against the background of the enactive approach is shown to be crucial for bringing about the radical epistemological shift that an enactive position entails. **> Implications** • The examination of the relationship between first-person research and enaction makes it possible to clarify the ground from which to address the specific challenges that arise in studying lived experience. Investigating these challenges is necessary for developing a coherent research program for the enactive scientific study of experience. **> Key words** • **Consciousness studies, descriptive experience sampling, enaction, first-person methods, lived experience, micro-phenomenological interview, radical neurophenomenology, reflexivity.**

Introduction

« 1 » For constructivist approaches, the concept of experience is as fundamental as the concept of the observer: It is through experience that the subject constructs her reality (Glaserfeld 1995). And yet, even though constructivism is its product, Western science has neglected the primacy of first-person experience in favor of the objectivist third-person perspective. First-person knowledge has been regarded as unreliable and prone to biases. Instead, mainstream science turned to an allegedly mind-independent world of objects different from the subject who is studying it, and took a position that, above all, has lost familiarity with our lived embodied experience and the practices that allow us to come into contact with it.

« 2 » In the last few decades, this mainstream view has been challenged from various areas of research, proposing a more

critical vision of science that recognizes the role of the observer and her embodied experience in the generation of knowledge. In particular, the development of the enactive approach to cognition contributed to opening up a space of studying experience in the field of cognitive science. This space was explicitly claimed in the research program of neurophenomenology proposed by Francisco Varela (1996).

« 3 » With this proposal, Varela called for the development of a science of consciousness that recognizes the primacy and the irreducible nature of lived experience. In particular, he invited the establishment of a dialogue between the mainstream third-person approaches of cognitive science and the disciplined study of experience from a first-person perspective. This proposal was echoed in several research groups in the field of cognitive science (for a comprehensive overview, see Berkovich-Ohana et al. 2020), prompting the concern for the study

of experience and promoting the development of specific methods and procedures.

« 4 » However, the depth of the implementation of this radical proposal has been called into question (e.g., Vörös 2014; Petitmengin 2017; Bitbol & Petitmengin 2017), as many neurophenomenological studies appear to deal with the theoretical, epistemological, and methodological tensions underlying the attempt to establish a dialogue between the third- and first-person methods by simply stepping onto the third-person side, assuming an objectivist framework. Consequently, the insights that lived experience can bring to the study of consciousness (and to science in general) have been compromised and are, therefore, of limited use.

« 5 » Surrendering to the objectivist framework is a consequence of the different degrees of development and consolidation of third- and first-person approaches. Making first-person investigation a research program is a relatively recent venture. A co-

herent framework for first-person research is still under construction: one that would make it possible to connect the phenomenon of study (i.e., lived experience), the theoretical background, the methodologies, and the criteria for the evaluation of research results. The purpose of this special issue is to contribute to the formulation of this alternative research program and to explore its possibilities and limitations.

« 6 » In this editorial, we will provide a brief review of the enactive approach and the study of lived experience both historically and methodologically, followed by a summary of the three target articles that constitute the first part of the two-part special issue. In the editorial to the second part of the special issue, published in the next issue of *Constructivist Foundations*, we will discuss the challenges awaiting the enactive scientific study of experience.

The enactive approach to cognition and cognitive science

« 7 » In this section, we outline the historical development of defining cognition as enaction and what this understanding means for the understanding of science.

Historical notes on seeing cognition as enaction

« 8 » In *The Embodied Mind (TEM)*, Varela, together with Evan Thompson and Eleanor Rosch (1991), introduced the notion of *enaction* to describe the idea of cognition as an embodied and dynamical process in which the cognizing organism *brings forth* (i.e., *enacts*) its world through its sensorimotor coupling with the environment. Radically departing from and challenging the classical objectivist representationalist views, the authors considered cognition not as the manipulation of internal, physically instantiated symbolic representations of an external world, but as a “skillful know-how in situated and embodied action” in which “[c]ognitive structures and processes emerge from recurrent sensorimotor patterns of perception and action” (Thompson 2007: 13).

« 9 » Developing the concept of enaction was another milestone in a long sci-

entific tradition that began with the idea of focusing on the dynamic and ever-changing character of biological and cognitive systems, a tradition that started with cybernetics and which continued with Humberto Maturana and Varela’s work in biology of cognition. In their theory, they considered living organisms to be “autopoietic” systems (i.e., self-producing and self-maintaining systems that bring forth their own cognitive domain; Maturana 1970; Maturana & Varela 1980, 1987) and established the notions of structural determinism, structural coupling, and operational closure of the nervous system.

« 10 » Nowadays, enaction is often presented in the context of so-called “E-approaches” or “4E cognition” (Newen, de Bruin & Gallagher 2018; Zaslowski & Arminjon 2018) – a heterogeneous collection of theories and research practices in cognitive science that, in contrast to viewing the mind as a largely disembodied information-processing machine, describe cognition and the mind as *embodied, embedded, extended, and/or enacted* (with some lists adding the dimensions of *affective*, as well as *experiential* and *ecological*).

« 11 » However, the assimilation of the notions of “enaction,” “embodiment” (as it is construed in *TEM*) and their derivatives under the umbrella of E-approaches has been accompanied by diluting or altogether overlooking the substantial philosophical commitments of the original proposal of enaction. The conception of cognition as enacted has been often appropriated to emphasize the active and bodily character of cognition without challenging the underlying metaphysical assumptions of realism and representationalism (Vörös, Froese & Riegler 2016).

« 12 » By contrast, introducing the idea of cognition as embodied action in *TEM* was part of a radical project of challenging the hegemony of the representationalist paradigm, which is based on the dichotomy between the *inner* (the pregiven cognitive system) and the *outer* (the pregiven external world). This paradigm leaves no choice other than explaining a cognitive system in terms of representing the system-independent existing world, or in terms of projecting its cognitive structures onto it. Enaction challenges this separation by seeing the cog-

nitive being and her world as inseparably related through mutual specification or co-determination (*TEM*: 199, also “dependent coorigination,” *ibid*: 150).

The enactive understanding of science

« 13 » In studying human cognition, we encounter the seemingly paradoxical situation of being the object of our own research. Science is the collective endeavor of cognitive beings, engaged in cognizing about the phenomena populating their experiential reality, producing explanations and descriptions of these phenomena. In cognitive science, this is the phenomenon of cognition itself. At first glance, it might be trivial to say that “any such scientific description, either of biological or mental phenomena, must itself be a product of the structure of our own cognitive system” (*TEM*: 10). However, as was already pointed out by second-order cybernetician Heinz von Foerster, since “a brain is required to write a theory of a brain” (2003: 289), when studying the mind, the observer becomes part of the observed system, and her own properties part of the descriptions of her observations. In this way, a second, closer look at the above claim reveals important implications for our understanding of (cognitive) science: Accepting the enactive framework, the conception of cognition as enaction must reflexively refer back to the very cognitive and epistemic processes involved in putting it forward.

« 14 » The reflexive application of enactive ideas about cognition to scientific activity and scientific knowledge results in a necessarily *non-objectivist conception of science* that makes it impossible to think of science as a tool that sheds light on things-in-themselves. Instead, the enactive understanding of science suggests that we should consider scientific activity as the systematic and ever more sophisticated extracting of rules from our lived experience. As such, science is not only fallible and prone to mistakes but also inextricably linked with us.

« 15 » Since the concept of enaction itself is a product of science, it cannot be considered a solid conceptual *ground* any more than other cognitive theories. Stressing the dynamic *interdependence* of mind and world, it cannot, at the same time, grant either side an *independent* existence. Instead, enaction is to be understood as a heuris-

tic – a conceptual instrument intended to “point beyond itself” (*TEM*: 228) towards an understanding of *groundlessness* as a fundamental feature of all human epistemic processes: “Cognition as the enactment of a world means that cognition has no ground or foundation beyond its own history, which amounts to a kind of ‘groundless ground’” (Thompson 2016: xviii).

« 16 » How can this unorthodox epistemic situation of groundlessness be dealt with in the context of cognitive science? Varela, Thompson, and Rosch’s way of confronting the unavoidable reflexivity of all epistemic processes in the context of studying the mind was to create and explore the “fundamental circularity” (*TEM*: 3) between cognitive science and human experience. The enactive framework suggests that lived experience is irreducible and central to any understanding of the mind, and that first-person inquiry is a necessary complementary partner to the third-person approaches of mainstream cognitive science. In particular, the idea is that inquiry into lived experience and cognitive scientific inquiry should be carried out in a mutually enriching and informing way. This takes us to the central topic of the special issue: the question of *how* to study lived experience in the enactive approach. Here we outline various concepts related to this question, while, in the editorial to the second part, we will address the challenges that derive from it.

Enaction and the study of lived experience

« 17 » In this section we look at neurophenomenology as the methodological implementation of the enactive approach, briefly present selected first-person methods, and highlight the relevance of understanding first-person research against the background of the enactive approach.

« 18 » Before turning to the presentation of neurophenomenology, we want to emphasize that developing a framework for the coherent study of experience to be in line with the enactive approach requires more than finding ways of establishing correlations between first- and third-person data. Consequently, while the topics introduced in this section (and in this special issue

more broadly) revolve around the neurophenomenological framework, they are not only relevant for studying experience under the paradigm of neurophenomenology designed to acquire both first- and third-person data, but also for studying experience in a wider context, irrespective of whether it is integrated with third-person methods of cognitive science.

The neurophenomenological program

« 19 » While emphasizing the importance of studying lived experience for the understanding of the mind and cognition, *TEM* did not, however, put forward a specific methodological framework for such investigation. Instead, the search for descriptive phenomenological accounts of lived experience primarily considered two sources: selected elements from the tradition of phenomenological philosophy (with particular focus on Maurice Merleau-Ponty’s phenomenology of the lived body), and Buddhist philosophy (with particular focus on meditative experience and mindfulness practices).

« 20 » In the three decades since *TEM*’s first publication, many of those working in fields related to cognitive phenomena have adopted a more welcoming attitude to the study of consciousness, have increasingly recognized the potential of a dialogue with phenomenology both on the theoretical level (e.g., Thompson 2007; Gallagher & Zahavi 2012; Colombetti 2014) and the applied level (e.g., Varela & Shear 1999b; Depraz, Varela & Vermersch 2003), and have developed various first-person methods for the systematic empirical exploration of lived experience. The major encouragement for the latter was the publication of Varela’s call for the research program of neurophenomenology (Varela 1996).

« 21 » Proposed as the “methodological expansion of the enactivist framework” (Vörös, Froese & Riegler 2016: 192), the neurophenomenological program starts from the non-objectivist philosophical foundations of the enactive approach with the decidedly *methodological* aim of establishing a concrete research practice that would foster the circulation between cognitive science and human experience: one in which first-person (phenomenological) accounts of lived experience and third-person

(behavioral and physiological) accounts “relate to each other through reciprocal constraints” (Varela 1996: 343).

« 22 » The concept of *reciprocal constraints* (in the literature also called *mutual constraints*) refers to the insistence that “both domains of phenomena have equal status in demanding a full attention and respect for their specificity” (ibid), and that investigating one side can and *should* inform and constrain investigations of the other side with regard to research questions and research designs, including the protocols of data acquisition and data analysis.¹

« 23 » The neurophenomenological program emphasized that disciplined first-person accounts cannot be acquired with “quick-and-easy” methods (Varela & Shear 1999a: 11) such as pre-defined psychological questionnaires, or with the casual, “just-take-a-look” (ibid: 2) attitude of everyday reporting on experience. While such approaches might sometimes tell us *something* about experience, they tend to fall prey to the habitual, natural attitude of everyday life that “assumes a number of received claims about both the nature of the experiencer and its intended objects” (Varela 1996: 336), including the “realist prejudice” about the existence of the observer-independent objective world (Depraz, Varela & Vermersch 2003). Without shifting to the phenomenological attitude, from which “the world and my experience appears as open and in need of exploration” (Varela 1996: 336), reporting on experience will tend to reproduce people’s beliefs about the experience, themselves, and the world, rather than describe experience as it is concretely lived in the first person. Inspired by Husserl’s phenomenological philosophy, it is this suspension of the natural attitude that distinguishes first-person methods as envisioned by Varela and

1 | In practice, studies aiming at establishing reciprocal constraints have adopted a variety of research designs, including the approach of “front-loading” phenomenological categories and insights into the experimental design of cognitive scientific studies (Gallagher 2003; Gallagher & Sørensen 2006). For a typology of bridges that have been established in past studies, see Berkovich-Ohana et al. (2020; section “Building Bridges Between Phenomenology and Physiology – Mutual Constraints”).

colleagues from the arguably theory-laden observational practices of introspectionist schools (Varela 1996).²

« 24 » Accordingly, Varela insisted that producing genuine first-person accounts requires “a proper, rigorous method and pragmatics” for the exploration and analysis of experience (Varela 1996: 347) that would enable a *disciplined cultivation of the phenomenological attitude* in examining experience, as well as the *intersubjective communication* of the results of such examination. Therefore, the neurophenomenological proposal entailed an explicit call for establishing first-person³ methods: methods for a systematic, phenomenologically guided acquisition of first-person data on lived experience.

First-person methods

« 25 » Today the nascent field of the first-person study of experience has a few well-defined first-person methods, resulting from methodological developments both within and outside the neurophenomenological framework.

« 26 » Stemming from a community of researchers gathered around the neurophenomenological proposal, publications such as *On Becoming Aware* (Depraz, Varela & Vermersch 2003) and *The View from Within* (Varela & Shear 1999b) set the ground for developing first-person methodologies by drawing on a wide range of influences – from Husserlian phenomenology, to contemplative traditions and practices, to introspective psychology and somatic practices.

« 27 » In the neurophenomenological context, the first well-defined study using first-person methods was conducted in the scope of Claire Petitmengin’s research on

the emergence of intuition (Petitmengin 1999). Drawing on prior work by Vermersch (1994), Petitmengin adapted his “entretien d’explicitation” (translated into English as “explicitation interview” and later “elicitation interview”) – an interview technique originally used for enabling the articulation and transmission of implicit knowledge in professional practice – for the context of cognitive science, leading to the establishment of the method today known as the *micro-phenomenological interview* (MPI) (Petitmengin 2006; Petitmengin, Remillieux & Valenzuela-Moguillansky 2019). Guided by the phenomenological practice of the *epoché* as the suspension of the natural attitude, MPI aims at helping the interviewee to select a singular experience, precisely situated in space and time, “evoking” this experience, and describing it. The description usually aims at elucidating the synchronic as well as the diachronic dimension of a given experience. The former refers to the configuration of different aspects of the experiential “landscape” at a particular moment, and the latter to how this experiential landscape has unfolded through time. Assisting the interviewee in providing this description entails loosening her absorption in the content (the “what”) of experience by asking specific questions that allow the articulating of its mode of givenness (the “how”), as well as bringing the interviewee’s focus back to lived experience whenever she strays away from it towards describing instead generalities, explanations, beliefs, or judgments about it.

« 28 » Other first-person methods have been advanced independently of the proposal for the neurophenomenological program. Among these, the most established and well-defined is the *descriptive experience sampling* method (DES) developed by Russell Hurlburt in the early 1980s (Hurlburt 1990, 2011; Hurlburt & Akhter 2006). DES aims at apprehending what Hurlburt calls “pristine inner experience,” i.e., “anything that is going on in awareness at the particular moment” (Hurlburt 2011: 52). In contrast to MPI, where the selection of the experiential episode to be investigated is defined by the research question of the particular study (and might target anything from the just-elapsed moment of experience to years- or even decades-old experience), DES uses a

beeper to sample the momentary ongoing experience just prior to the moment of the beep. This sampling is paired with subsequent “expositional interviews” that further explore and clarify the sample of experience. DES insists on “bracketing presuppositions” (Hurlburt 2011: 133f) about experience and on focusing the interviewee’s attention on the experience as it was concretely lived in a specific moment in time. This makes DES, while not itself originally based on the phenomenological method, compatible with the idea of suspending natural attitude central to Varela’s neurophenomenological proposal.

« 29 » Over the last two decades, MPI and DES have been employed in a number of stand-alone, exclusively first-person research designs, but also increasingly combined with third-person methods in neurophenomenological studies.⁴

« 30 » Beyond MPI and DES, neurophenomenological studies have employed a variety of other approaches for acquiring data on experience: from iteratively training participants to delineate stable and individual-specific phenomenological categories in their own experience (e.g., Lutz et al. 2002), through relying on retrospective or concurrent self-reports provided by expert meditation practitioners (e.g., Dor-Ziderman et al. 2013; Jo et al. 2014), to employing different versions of quantitative experience sampling paradigms (e.g., Christoff et al. 2009).⁵

« 31 » Importantly, not all of these approaches fit the characteristics of first-person methods envisioned in the original neurophenomenological proposal (Varela 1996; Varela & Shear 1999a; Depraz, Varela & Vermersch 2003). Rather, the term “first-person method” is sometimes used in a broader sense to denote *any* kind of method that gathers *some* first-person data on experience (even if these come in a form selecting a digit on a Likert scale). In this line, Berkovich-Ohana et al. (2020) suggest a broader understanding of the first-person

2| For a critique of introspectionism from the perspective of specific first-person methods, see Monson & Hurlburt (1993) and Bitbol & Petitmengin (2013).

3| Interview-based first-person methods, in which the interviewer assists the experiencing subject in examining her experience and articulating the report, are sometimes called “second-person methods” (e.g., Froese, Gould & Barrett 2011; Olivares et al. 2015). In order to avoid confusion, in this editorial we stick to the term “first-person methods” to describe any kind of method aimed at providing first-person data that follows the considerations outlined above.

4| For a comprehensive overview of studies, see “Research axes” on <https://www.microphe-nomenology.com> for MPI, and “Selected papers” on <http://hurlburt.faculty.unlv.edu> for DES.

5| For an overview of empirical studies related to the neurophenomenological program, see Berkovich-Ohana et al. (2020: 3, in particular Table 2).

side of neurophenomenological studies, placing first-person data on a continuum of complexity between

- *Thin phenomenology* at the lower end, which includes results acquired through questionnaires and self-reports, often relying on pre-defined categories; and
- *Thick phenomenology* at the upper end, which encompasses “highly refined, detailed and dynamic accounts of singular subjective experiences (such as data gathered through micro-phenomenology)” (ibid: 5).

« 32 » According to Berkovich-Ohana and colleagues, methods anywhere on this continuum of complexity can play a role in neurophenomenological research, depending on the aim and design of the specific research projects: Thin phenomenology allows for a rapid, repeated, and uniform collection of data that is easier to formalize, while thick phenomenology can provide more refined accounts of experience, but ones that are more difficult to generalize and quantify.

“Radical” understanding of neurophenomenology and the primacy of experience

« 33 » Neurophenomenology is today often understood much more broadly than suggested in its original proposal: Labelling a study as “neurophenomenological” sometimes implies nothing more than that researchers collected, alongside third-person physiological and/or behavioral data, *some* type of data on experience, and took both sides into account in *some* way. This broadening of the notions of “first-person method” and “reciprocal constraints” has been accompanied by overlooking the non-objectivist roots and implications of the neurophenomenological proposal. As has been pointed out by various authors (e.g., Vörös, Froese & Riegler 2016; Bitbol & Antonova 2016; Vörös 2017), a careful reading of the neurophenomenological proposal results in much more than a recipe for a research design: it brings the researcher to challenge the very assumptions of the theory and practice of objectivist science.

« 34 » Relating to this broadening, Petitmengin (2017; see also Bitbol & Petitmengin 2017) distinguishes between two interpretations and implementations of the

neurophenomenological program that she calls mild (light) and radical (deep) neurophenomenology. *Mild neurophenomenology* refers to research whose main aim is to establish correlations between first- and third-person data – a process that, as mentioned above (Footnote 1), can be carried out in a variety of ways. However, Petitmengin stresses that regardless of how refined the first- and third-person data and the correlations between them are, research in mild neurophenomenology considers the “subjective” and “objective” poles and the gap between them as pre-given, complying – in attempts at bridging this gap – with the objectivist (or “correspondentist”; Petitmengin 2017: 141) understanding of the epistemic status and validity of first-person data.

« 35 » *Radical neurophenomenology*, on the contrary, regards experience as more than the “subjective pole” of neurophenomenological research. Instead it recognizes it as the primary medium in which the subjective and the objective poles are co-constituted in the first place. In other words, radical neurophenomenology (as a consistent reading of the original neurophenomenological proposal) insists that adopting a genuinely phenomenological attitude requires one to recognize lived experience not only as a possible “object” of scientific study, but as a necessary *starting point and medium* of any type of scientific activity – or that, as Varela put it in an often-quoted passage: “Lived experience is where we start from and where we all must link back to, like a guiding thread” (Varela 1996: 334).

« 36 » At the same time, this radical (i.e., consistent) understanding of neurophenomenology points towards a necessity for developing alternative, non-objectivist and non-representationalist epistemological frameworks for first-person research (Bitbol & Petitmengin 2013; Kordeš 2016; Kordeš & Demšar 2018). It recognizes that results of first-person studies cannot be evaluated by comparing their correspondence to the desired yet inherently unattainable “original” experience back in time. Consequently, the criteria of validation shift towards an alternative processual or performative basis (Petitmengin & Bitbol 2009; Petitmengin 2017).

Some open questions for the enactive science of experience

« 37 » Based on the above considerations, we can conclude that for the enactive approach, first-person methods are more than just an instrument for acquiring data on lived experience as one of the phenomena of cognitive scientific investigation, they are more than a magnifying glass zooming in on subjectivity. Rather, to study experience means to study and question the very context and assumptions of scientific activity. As pointed out by Varela,

“It requires us to leave behind a certain image of how science is done, and to question a style of training in science which is part of the very fabric of our cultural identity.” (Varela 1996: 347)

The reflexive conundrum of taking experience as a phenomenon of investigation – as first-person methods do – but at the same time recognizing it as what makes any type of investigation and knowledge construction possible in the first place, implies theoretical, epistemological, and methodological challenges and open questions that have to be addressed in order to undertake the enactive study of experience. To mention but a few:

- How does the enactive approach understand the notion of experience, and how is “experience” operationalized and delimited as a phenomenon of investigation in the research practice of specific first-person methods?
- How are the concepts of “natural attitude,” “phenomenological attitude,” and “epoché” understood and translated into research practices that follow phenomenological guidelines?
- How is the requisite of suspending assumptions and beliefs about experience related to considering the social, cultural, and historical context in which a given experience unfolds?
- How does the enactive approach conceive of the relationship between experience and language, and how does this translate into understanding the process of producing verbal descriptions of experience?
- How does the enactive approach understand the process of remembering a past experience, central to the implementation of first-person methods?

- How does the enactive approach frame the intersubjective dimension inherent to collecting and analyzing data in first-person research? How can the intersubjective dimension involved in constructing first-person knowledge be taken into account in building a non-objectivist framework for assessing the validity of results of first-person research?
- What is the epistemic status of results of first-person research, particularly in relation to the enactive understanding of remembering, language, and intersubjectivity as intrinsic to the acquisition of first-person descriptions?
- How can we build a consistent framework for the validation of first-person research that would embrace the dynamic and transformative character of coming into contact with experience, which presents both the *condition for* and the *result of* first-person investigation?

Some of these questions will inspire the editorial to the second part of the special issue.

Introducing the contributions

« 38 » This special issue was conceived in the context of a three-year project called “An embodied approach to the study of experience” whose overall aim was to generate an international and interdisciplinary collaborative network to address the challenges of implementing this project.

« 39 » The majority of articles included in this two-part special issue are related to the presentations held at the conference “An embodied approach to the study of experience” that took place in an online format between the 5 and 9 October 2020, envisioned as the culmination of the described project.⁶ The articles aim at contributing to the exploration and advancement of the enactive approach to the scientific study of experience from a variety of perspectives, encompassing both theoretical analyses and presentations of empirical research.

6| The talks are available at https://www.youtube.com/watch?v=YHPXoBKzxFY&list=PL1yIa9mDbxqVQOIE1u3jvFUzZBV_14tOn&index=2

« 40 » The three contributions in this first part of the special issue demonstrate the diversity of questions emerging from considering the scientific study of experience from an enactive perspective, and the variety of angles that are relevant for thinking about them.

« 41 » The article by **Michel Bitbol** delves into the very philosophical core of Varela’s neurophenomenological proposal by developing a metaphysical (or “quasi-metaphysical”) counterpart to the methodological framework of neurophenomenology. Bitbol criticizes Varela’s anti-metaphysical attitude, considering it an obstacle to the dissemination and reception of the neurophenomenological project amongst philosophers of mind and cognitive scientists who are interested in the metaphysics of mind and consciousness. After surveying a selection of established ontologies, Bitbol suggests an alternative metaphysics that prioritizes conscious experience over that which is experienced as external world. Adopting this stance, which takes consciousness to be prior to knowledge of the brain qua object, as opposed to asking how consciousness can arise from a physical brain (an approach that takes an external, mind-independent world for granted) alters how we view the hard problem. The implications for how we can then conceive of brain, mind, and experience are explored, aided by Merleau-Ponty’s “intra-ontology,” appealing to a cybernetic dialectic of constitution and emergence, and concluding with a defense of neurophenomenology as a methodological approach that avoids the hard problem.

« 42 » The article by **Claire Petitmengin** stresses the existential and transformative dimension of coming into contact with experience. Petitmengin suggests that being cut off from and unobservant of our lived experience has disastrous consequences for individuals and society as a whole. Based on a long-term practice of researching lived experience with micro-phenomenology, she describes what she calls the “felt” dimension of experience. She highlights the transformative potential of getting in touch with this dimension, which she suggests is essential for resolving the dire problems we globally face nowadays.

« 43 » The article by **Sebastián Medeiros, Carla Crempien, Alejandra Vásquez-Rosati, Ja-**

viera Duarte, Catherine Andreu, Álvaro Langer, Miguel Ibaceta, Jaime Silva, and Diego Cosmelli presents an example of an empirical neurophenomenological study that integrates first- and third-person methods. Their main objective is to establish a neurophenomenological understanding of mindfulness-based interventions in relation to coping with depressive and anxiousness-related symptoms. The authors examine the experiential dynamics of searching for emotional regulation strategies before and after participants engaged with the mindfulness-based intervention. The study is neurophenomenological in the “mild” sense of attempting to correlate first- and third-person data. First-person data consist of first-person accounts acquired with MPI (thick phenomenology) and questionnaire-based reports (thin phenomenology), while third-person data consist of physiological measures of heart rate variability. One case study is presented in detail. The commentaries on this contribution point at interesting challenges of combining first and third-person methods.

Conclusion

« 44 » Our stroll through the historical development of enaction, the neurophenomenological program, and first-person methods let us emphasize the radical epistemological shift that is entailed in the enactive position. This radical shift results in theoretical, epistemological, and methodological challenges. So, our stroll has not ended yet. In the editorial to the second part of this special issue, we will systematize and address some of those challenges. In doing so, we attempt to advance the development of a coherent research program for the scientific study of experience conceived from an enactive perspective.

Funding

Camila Valenzuela-Moguillansky has been supported by project REDI170181 of ANID, (Agencia Nacional de Investigación Científica y Tecnológica – Chile) – PCI (Programa de Colaboración Internacional).



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References

- Berkovich-Ohana A., Dor-Ziderman Y., Trautwein F.-M., Schweitzer Y., Nave O., Fulder S. & Ataria Y. (2020) The hitchhiker's guide to neurophenomenology: The case of studying self boundaries with meditators. *Frontiers in Psychology* 11: 1680. [► https://cepa.info/6666](https://cepa.info/6666)
- Bitbol M. & Antonova E. (2016) On the too often overlooked radicality of phenomenology. *Constructivist Foundations* 11(2): 354–356. [► https://constructivist.info/11/2/354](https://constructivist.info/11/2/354)
- Bitbol M. & Petitmengin C. (2013) A defense of introspection from within. *Constructivist Foundations* 8(3): 269–279. [► https://constructivist.info/8/3/269](https://constructivist.info/8/3/269)
- Bitbol M. & Petitmengin C. (2017) Neurophenomenology and the micro-phenomenological interview. In: Schneider S. & Velmans M. (eds.) *The Blackwell companion to consciousness*. Second edition. Wiley & Sons, Hoboken NJ: 726–739. [► https://cepa.info/4120](https://cepa.info/4120)
- Christoff K., Gordon A. M., Smallwood J., Smith R. & Schooler J. W. (2009) Experience sampling during fMRI reveals default network and executive system contributions to mind wandering. *PNAs* 106(21): 8719–8724.
- Colombetti G. (2014) *The feeling body: Affective science meets the enactive mind*. MIT Press, Cambridge MA.
- Depraz N., Varela F. J. & Vermersch P. (2003) *On becoming aware*. John Benjamins, Amsterdam.
- Dor-Ziderman Y., Berkovich-Ohana A., Glicksohn J. & Goldstein A. (2013) Mindfulness-induced selflessness: A MEG neurophenomenological study. *Frontiers in Human Neuroscience* 7: 582. <https://doi.org/10.3389/fnhum.2013.00582>
- Foerster H. von (2003) Ethics and second-order cybernetics. In: *Understanding understanding*. Springer, New York: 287–304.

- <https://cepa.info/1742> French original published in 1991. ► <https://cepa.info/1733>
- Froese T., Gould C. & Barrett A. (2011) Re-viewing from within: A commentary on first- and second-person methods in the science of consciousness. *Constructivist Foundations* 6(2): 254–269. ► <https://constructivist.info/6/2/254>
- Gallagher S. (2003) Phenomenology and experimental design: Toward a phenomenologically enlightened experimental science. *Journal of Consciousness studies* 10(9–10): 85–99. ► <https://cepa.info/2277>
- Gallagher S. & Sørensen J. B. (2006) Experimenting with phenomenology. *Consciousness and Cognition* 15(1): 119–134.
- Gallagher S. & Zahavi D. (2012) *The phenomenological mind*. Routledge, London. ► <https://cepa.info/4356>
- Glaserfeld E. von (1995) *Radical constructivism: A way of knowing and learning*. Falmer Press, London. ► <https://cepa.info/1462>
- Hurlburt R. T. (1990) *Sampling normal and schizophrenic inner experience*. Plenum Press, New York.
- Hurlburt R. T. (2011) *Investigating pristine inner experience: Moments of truth*. Cambridge University Press, Cambridge.
- Hurlburt R. T. & Akhter S. A. (2006) The Descriptive Experience Sampling method. *Phenomenology and the Cognitive Sciences* 5(3–4): 271–301.
- Jo H. G., Wittmann M., Borghardt T. L., Hinterberger T. & Schmidt S. (2014) First-person approaches in neuroscience of consciousness: Brain dynamics correlate with the intention to act. *Consciousness and Cognition* 26: 105–116.
- Kordeš U. (2016) Going beyond theory: Constructivism and empirical phenomenology. *Constructivist Foundations* 11(2): 375–385. ► <https://constructivist.info/11/2/375>
- Kordeš U. & Demšar E. (2018) Excavating belief about past experience: Experiential dynamics of the reflective act. *Constructivist Foundations* 13(2): 219–229. ► <https://constructivist.info/13/2/219>
- Lutz A., Lachaux J.-P., Martinerie J. & Varela F. J. (2002) Guiding the study of brain dynamics by using first-person data: Synchrony patterns correlate with ongoing conscious states during a simple visual task. *Proceedings of the National Academy of Sciences* 99(3): 1586–1591. ► <https://cepa.info/2092>
- Maturana H. R. (1970) *Biology of cognition*. Biological Computer Laboratory (BCL) Research Report BCL 9.0. University of Illinois, Urbana. Reprinted in: Maturana H. R. & Varela F. J. (1980) *Autopoiesis and cognition: The realization of the living*. Kluwer, Dordrecht: 5–58. ► <https://cepa.info/535>
- Maturana H. R. & Varela F. J. (1980) *Autopoiesis and cognition: The realization of the living*. Kluwer, Dordrecht. ► <https://cepa.info/556>
- Maturana H. R. & Varela F. J. (1987) *The tree of knowledge: The biological roots of human understanding*. Shambhala, Boston. ► <https://cepa.info/591>
- Monson C. K. & Hurlburt R. T. (1993) A comment to suspend the introspection controversy: Introspecting subjects did agree about “imageless thought.” In: Hurlburt R. T. (ed.) *Sampling inner experience in disturbed affect*. Plenum, New York: 15–26.
- Newen A., de Bruin L. & Gallagher S. (eds.) (2018) *The Oxford handbook of 4E cognition*. Oxford University Press, Oxford.
- Olivares F. A., Vargas E., Fuentes C., Martínez-Pernía D., & Canales-Johnson A. (2015) *Neurophenomenology revisited: Second-person methods for the study of human consciousness*. *Frontiers in Psychology* 6: 673. <https://doi.org/10.3389/fpsyg.2015.00673>
- Petitmengin C. (1999) The intuitive experience. *Journal of Consciousness Studies* 6(2–3): 43–47. ► <https://cepa.info/2411>
- Petitmengin C. (2006) Describing one’s subjective experience in the second person: An interview method for a science of consciousness. *Phenomenology and the Cognitive Sciences* 5(3–4): 229–269. ► <https://cepa.info/2376>
- Petitmengin C. (2017) Enaction as a lived experience: Towards a radical neurophenomenology. *Constructivist Foundations* 12(2): 139–147. ► <https://constructivist.info/12/2/139>
- Petitmengin C. & Bitbol M. (2009) The validity of first-person descriptions as authenticity and coherence. *Journal of Consciousness Studies* 16: 363–340. ► <https://cepa.info/2377>
- Petitmengin C., Remillieux A. & Valenzuela-Moguillansky C. (2019) Discovering the structures of lived experience: Towards a micro-phenomenological analysis method. *Phenomenology and the Cognitive Sciences* 18(4): 691–730. ► <https://cepa.info/6664>
- Thompson E. (2007) *Mind in life: Biology, phenomenology, and the sciences of mind*. Harvard University Press, Cambridge MA. Reviewed in ► <https://constructivist.info/3/2/117>
- Thompson E. (2016) Introduction to the revised edition. In: Varela F. J., Thompson E. & Rosch E., *The embodied mind: Cognitive science and human experience*. Revised edition. MIT Press, Cambridge MA: xvii–xxxiii. ► <https://cepa.info/4379>
- Varela F. J. (1996) *Neurophenomenology: A methodological remedy to the hard problem*. *Journal of Consciousness Studies* 3(4): 330–349. ► <https://cepa.info/1893>
- Varela F. J. & Shear J. (1999a) First-person methodologies: What, why, how? *Journal of Consciousness Studies* 6: 1–14. ► <https://cepa.info/2080>
- Varela F. J. & Shear J. (eds.) (1999b) *The view from within: First-person approaches to the study of consciousness*. Imprint Academic, Thorverton UK.
- Varela F. J., Thompson E. & Rosch E. (1991) *The embodied mind: Cognitive science and human experience*. MIT Press, Cambridge MA.
- Vermersch P. (1994) *L’entretien d’explicitation [The explicitation interview]*. ESF, Paris.
- Vörös S. (2014) The uroboros of consciousness: Between the naturalisation of phenomenology and the phenomenologisation of nature. *Constructivist Foundations* 10(1): 96–104. ► <https://constructivist.info/10/1/096>
- Vörös S. (2017) Enacting enaction: Conceptual nest or existential mutation? *Constructivist Foundations* 12(2): 148–150. ► <https://constructivist.info/12/2/148>
- Vörös S., Froese T. & Riegler A. (2016) *Epistemological odyssey: Introduction to special issue on the diversity of enactivism and neurophenomenology*. *Constructivist Foundations* 11(2): 189–204. ► <https://constructivist.info/11/2/189>
- Zaslavski N. & Arminjon M. (eds.) (2018) Special Issue “E-approaching Cognition with Shaun Gallagher.” *Constructivist Foundations* 14(1). ► <https://constructivist.info/14/1>