Available online at www.sciencedirect.com

ScienceDirect

Current Opinion in Psychology

# Studying the experience of meditation through Micro-phenomenology☆

Claire Petitmengin[1,2], Martijn van Beek[3], Michel Bitbol[2], Jean-Michel Nissou[4] and Andreas Roepstorff[3]

Numerous scientific studies are conducted on the neurophysiological effects of meditation practices and on the neural correlates of meditative states. However, very few studies have been conducted on the experience associated with contemplative practice: what it is like to meditate — from moment to moment, at different stages of different forms of practice — remains almost invisible in contemporary contemplative science. Recently, 'micro-phenomenological' interview methods have been developed to help us become aware of lived experience and describe it with rigor and precision. This article presents the results of a pilot project aiming at applying these methods to the description of meditative experience, and highlights the interest of such descriptions for understanding, practicing and teaching meditation.

**Addresses**
[1] Institut Mines-Télécom Business School, 9 rue Charles Fourier, 91011 Evry, France
[2] ENS Paris, Archives Husserl, 45 rue d'Ulm, 75005 Paris, France
[3] Aarhus University, Interacting Minds Centre, Jens Chr. Skous Vej 4, 8000, Aarhus, Denmark
[4] Laboratory of Micro-phenomenology, 12, rue de la tourelle, 45390 Puiseaux, France

Corresponding author: Petitmengin, Claire (cp@clairepetitmengin.fr)

**Current Opinion in Psychology** 2019, **28**:54–59

This review comes from a themed issue on **Mindfulness**

Edited by **Amit Bernstein**, **Dave Vago** and **Thorsten Barnhofer**

For a complete overview see the Issue and the Editorial

Available online 25th October 2018

https://doi.org/10.1016/j.copsyc.2018.10.009

2352-250X/© 2018 Elsevier Ltd. All rights reserved.

## Introduction

In our society, where interest especially in secularized forms of meditation such as 'mindfulness' is growing exponentially, numerous scientific studies have been conducted on the neurophysiological *effects* of meditation practice [e.g. Refs. 2–8] and on the neural *correlates* of meditative states [e.g. Refs. 9–13]. Many studies have also demonstrated the psychological, clinical and preventive effects of mindfulness, providing important results [e.g. Refs. 14–19]. For example, it has been shown that the practice of meditation may reduce stress, anxiety, and depression relapse rates. Although the importance of first-person reports of meditative experience is frequently noted in the emergent field of contemplative science [e.g. Refs. 20,21,22,23,24,25•,26,27,28•], thus far, what it is like to meditate, from moment to moment, at different stages of a given practice, has barely been addressed [e.g Refs. 29,30,31,32,33,34•,35]. In some cases, phenomenological categories are used as a heuristic tool to generate hypotheses about the neurophysiological mechanisms of meditation practices [36], but apart from a recent study [37•], these categories are derived from the analysis of texts such as meditation manuals, not from phenomenological description of these practices.

This vacuum may be explained by the common assumption that since meditative experience — like any experience — is produced by brain activity, the knowledge of its neural correlates is enough to understand what is at stake in meditation and to explain its effects. It may also be due to the distrust of introspection in Western science which, ever since Auguste Comte claimed that it is impossible to walk in the street while watching oneself from the balcony, has insisted on its exclusion. Moreover, in contemplative traditions, it is not common and usually discouraged to talk about one's experience, except with one's teacher.

This lack of knowledge about meditative experience seems to hamper the understanding of both the effects of practice and its neural correlates: its effects, because only fine-grained descriptions of the practitioners' experience would enable us to understand the processes mobilized during meditation, that may help to explain such effects [38]; its correlates, because the more the neuroimaging techniques are refined, the finer the level of granularity of description of the corresponding experience needs to be in order to enable the cognitive neuroscientist to make sense of recorded brain activity [39]. Moreover, by focusing on the effects and correlates of meditation, scientific studies seem to forget the essence, the very purpose of this practice which is to train oneself to 'see things as they are' (see e.g. Ref. [40•]). What does this training consist of? What do practitioners experience

---

☆ This article is a synthesis and update of Ref. [1].

at different stages of their trainings? To begin to answer these questions, the only way is to ask them what they live. But even for advanced meditative practitioners, who are supposed to have developed a very fine awareness of their experience, it is often not so easy to describe precisely what they actually do when they practice. We applied 'Micro-phenomenology', a recently developed method allowing one to become aware of one's experience and to describe it with precision, to meditative practice. After a brief presentation of the method, we will give an example of the type of descriptions it enabled us to collect. We will then highlight the interest of such descriptions for the understanding, the practice and the teaching of meditation.

## Micro-phenomenology

Micro-phenomenology is a method of descriptive phenomenology inspired by the '*entretien d'explicitation*' initially developed by the French psychologist Pierre Vermersch [41–43] to help persons engaged in professional practices to become aware of the implicit part of their actions and transfer their expertise. At the instigation of Francisco Varela, this method was adapted to the domain of cognitive science to describe any type of lived experience [44]. It has been complemented by a method for analyzing verbal reports and detecting regularities in the form of generic structures [45,46].

The particularity of the method is to help the interviewee provide descriptions of the *microdynamics* of *singular* experiences, even in their initially *unrecognized* dimensions. Here is a short excerpt of interview:

- *When I realized that I was gone, the thought vanished.*
- *How did it vanish? Was it instantaneous or gradual?*
- *It was very quick, but it nevertheless took a moment.*
- *And what happened during this moment?*
- *[silence . . . ] I loosen, I loosen my tension on that thought.*
- *And when you loosen your tension on that thought, what do you loosen?*
- *In fact I loosen a light tension in my head.*
- *Where exactly is this light tension in your head?*
- *It is at the top to the right and at the front of the head.*
- *And when you loosen it, how do you go about it, what do you do?*
- *And so on.*

This excerpt shows that the questions of the interviewer are 'empty of content': they are limited to drawing the subject's attention to the various moments of the experience, without suggesting any content, for example: 'what happened at that moment?', 'what happened then?'. Another typical question consists in questioning the verbs of action used by the interviewee, for example: 'when you loosen this tension, what do you do?', a question which is at the same time very focused and non-inductive, because completely empty of content. It helps the interviewee stabilize his/her attention on a subtle inner micro-gesture and provide a precise description, without infiltrating any presuppositions. The question 'How do you know that your attention is now loosened?' draws the interviewee's attention towards implicit criteria of accurate realization of this micro-gesture. The slowing down of the verbal flow, the presence of hesitations and silences, co-verbal gestures, and the use of action verbs in the present tense are then clues that the subject is not reciting pre-existing knowledge but is discovering previously unnoticed processes.

The iterative structure of micro-phenomenological interviews helps the subject to evoke the experience to be described multiple times, while guiding his/her attention towards a diachronic mesh which is finer each time. The resulting descriptions are very fine-grained. An interview to elicit a description of a few seconds of experience commonly takes one hour.

The evaluation of the reliability of the reports [47–51] is based on the one hand on the assessment of the content-empty character of the *interviewer's* interventions, and of their ability to guide the interviewee from the expression of generalities, comments, judgments and conceptualizations *about* meditative experience towards the evocation and description of a singular lived experience of meditation. This evaluation is based on the other hand on clues of reliability detected in the *interviewee's* answers, such as the verbal, non-verbal and para-verbal clues of contact of the interviewee with his/her experience, or the consistency of the description in spite of the iterative structure of the interview.

The main difficulty of the method is its apparent simplicity: just like meditative practice, the extreme simplicity of the micro-phenomenological interview, far from being 'natural', is an art which requires extensive, long-term training.

## Describing meditative experience: the emergence of a thought

We began to apply this 'experiential microscope' to processes of which meditation practice enables the practitioner to become aware, such as the twofold process of loss of contact with the current situation and generation of virtual ones in mind-wandering episodes. Several experienced practitioners described in detail the early phases of the emergence of a 'thought' before it develops into a virtual scene in which the practitioner becomes absorbed. Their accounts suggest the following micro-dynamic process, which remains a hypothesis to be confirmed by further studies.

A thought at first seems to emerge in the form of a tiny 'impulse', which one of the practitioners locates in the center of her chest.

> "Not so much an image, but a felt sense that something arises. Like a little movement . . . a perturbation. It's not a thought yet. It's just a kind of a stirring. Something is about to happen." (Anna)

This micro-impulse is immediately followed by a tension towards this first movement, which seems localized in the eyes and the head, closely associated with a retention of the breathing and a tightening in the throat.

> "A tension corresponding to the intention to do something, comparable to the feeling of scrutinizing something visually, of making an effort to see better something far away, which gives a sensation of tension inside the skull." (Anna)

The effects of this tension are the following:

> ***A lack of circulation of the flow of energy in the body***: "It is as if life is not flowing completely freely in the body. There is less permeation by life" (Helen)

> ***A feeling of disconnection of the head and the body:*** "It feels like the head is cut off from the body". (Anna)

> ***A point of disconnection***: "The flow of the energy between the body and the head gets built up in the throat." (Anna)

> ***A subtle feeling of discomfort elicited by this disconnection***: "It's uncomfortable"; "A kind of, a subtle numbness"; "A feeling, a kind of discomfort"; "Not like feeling nauseous or anything like that, but just like, a sense of that." (Helen)

Usually this process of emergence of a micro-impulse, immediately followed by a tension, remains unnoticed and develops to give birth to a virtual scene in which the attention becomes absorbed. Experienced practitioners are often able to recognize this and to disengage from it.

The trigger of this releasing is for Anna the awareness of the feeling of disconnection, itself triggered by the sensation of discomfort associated with this disconnection:

> "It's uncomfortable, so it kind of brings attention to itself. That's how I know the disconnection happened." (Anna)

The releasing of the tension may be spontaneous, involuntary, but can also be facilitated by voluntary inner micro-gestures such as releasing the breath and the tightening in the head or the throat, opening the scope of attention and using peripheral vision, or accentuating the awareness and density of the back and bottom of the body:

> "I go down, I drag something down in the body. It becomes denser in the lower body." (Lise)

The effects of this letting go or releasing include the disappearance of the emerging thought, a reconnection of the head and the body, a feeling of flow and warmth, of connection between oneself and the world, of dissolution of the rigid border usually felt between them.

## Usefulness of the interviews

### Understanding effects of meditation

In summary, in several descriptions we collected, as soon as the premise of a thought arises in the form of a tiny 'impulse', a subtle tension may have the effect of producing a sense of disconnection between the head and the body or a feeling of discomfort or 'numbness'. When in the course of mind wandering episodes the emerging thought is transformed into a virtual scene, this loss of bodily awareness may intensify up to a complete loss of awareness of bodily feelings. The descriptions we collected suggest that this loss may elicit a kind of rigidification and partitioning not only between the head and the body, but between 'inner' and 'outer' space, between the subject and the environment. Conversely, coming back to the present sensations allows life and warmth to flow again. It fosters a reunification of mind and body, self and world, creating a feeling of deep relief, connectedness and freedom.

It seems to us that these descriptions may offer an interesting avenue for explaining the unhappiness said to be associated with mind wandering [52], as well as a possible therapeutic effect of meditation (e.g. Ref. [53]). We can hypothesize that the discomfort generated by attentional drift is not (only) due to the (pleasant or unpleasant) content of the virtual scene, but to the very loss of contact with the intimacy of experience, notably bodily experience. The therapeutic effect of meditation would not be explained by the attainment of a particular experiential content, but by the process of regaining contact with lived experience, regardless of its content. Furthermore, Micro-phenomenology opens an interesting line of research on this very process, by giving us the means to investigate the micro-acts that enable us to come into contact with our experience and 'see what is there'.

### Practicing meditation

What do words do to meditative experience? In some contemplative contexts, the use of language is considered as an obstacle to deepening the practice. However, all the practitioners we interviewed agreed that micro-phenomenological interviews helped them to refine, deepen and stabilize their practice. Even if words do not describe an experience completely satisfactorily, they serve as 'handles' or 'pointers' that enable the practitioner to discriminate subtle aspects which might have vanished without their help:

> "One thing I find with the interview is that it sharpens your awareness, the clarity about what is actually going on. And the sharpening lies in the work that goes into finding words." (Helga)

Furthermore, words may have the power to trigger in the listener or reader the recognition of an experience which was previously unnoticed. The recognition of the experience which is pointed to by the word, and the adoption of this word by the listener, mark the start of a possible intersubjective agreement on that word to designate a particular subtle meditative movement. In other words, the indicial function of words does not prevent the creation of a shared, specialized vocabulary to communicate about meditative experience.

### Teaching meditation

Meditation instructors who have been trained in the micro-phenomenological interview method testify that it is also useful for them in the context of their teaching. On the one hand, a more refined awareness of their own practice helps them to refine their meditation instructions. On the other hand, micro-phenomenological interviews with their students help them to obtain a better sense of how they actually practice, to identify better the difficulties they meet, and to develop a richer palette of instructions tailored more precisely to particular individuals at specific points in their development.

## Conclusion

Interviews enable us as researchers to begin to collect fine-grained descriptions of the microgenesis of the structures of experience that we usually take for real, such as the rigid separation between inner and outer space, and between subject and object [54•,55]. This work of description helps us to understand better how these structures generate suffering, and to understand better the process through which they sometimes dissolve.

Our pilot study shows that meditative experience is a research object in its own right that is of great value to first, understand the processes that are involved in meditation; second, understand their effects, including their therapeutic effects; third, refine the teaching of meditation; fourth, refine our understanding of the concrete processes that underlie some concepts of Buddhist epistemology. Since experience is primary [56], its disciplined micro-phenomenological investigation provides a necessary and irreducible insight into its unfolding.

## Acknowledgements

The "Phenopilot" project, as it was called, was supported by a grant from the Mind and Life Institute. Part of the research in Denmark was funded by grants from the Velux Foundation and the Danish Research Council for Culture and Communication.

## References and recommended reading

Papers of particular interest, published within the period of review, have been highlighted as:

- • of special interest

1. Petitmengin C, Van Beek M, Bitbol M, Nissou JM, Roepstorff A: **What is it like to meditate? Methods and issues for a micro-phenomenological description of meditative experience**. *J Conscious Stud* 2017, **24**:170-198.
2. Desbordes G, Negi LT, Pace TWW, Wallace BA, Raison CL, Schwartz EL: **Effects of mindful-attention and compassion meditation training on amygdala response to emotional stimuli in an ordinary, non-meditative state**. *Front Hum Neurosci* 2012, **6**:292 http://dx.doi.org/10.3389/fnhum.2012.00292.
3. Allen M, Dietz M, Blair K, van Beek M, Rees G, Vestergaard-Poulsen P, Lutz A, Roepstorff A: **Cognitive-affective neural plasticity following active-controlled mindfulness intervention**. *J Neurosci* 2012, **32**:15601-15610.
4. Reiner K, Tibi L, Lipsitz JD: **Do mindfulness-based interventions reduce pain intensity? A critical review of the literature**. *Pain Med* 2013, **14**:230-242 http://dx.doi.org/10.1111/pme.12006.
5. Rosenkranz MA, Lutz A, Perlman DM, Bachhuber DR, Schuyler BS, MacCoon DG, Davidson RJ: **Reduced stress and inflammatory responsiveness in experienced meditators compared to a matched healthy control group**. *Psychoneuroendocrinology* 2016, **68**:117-125.
6. Chételat G, Mézenge F, Tomadesso C, Landeau B, Arenaza-Urquijo E, Rauchs G, André C, de Flores R, Egret S, Gonneaud J *et al.*: **Reduced age-associated brain changes in expert meditators: a multimodal neuroimaging pilot study**. *Sci. Rep.* 2017, **7**.
7. Kral TRA, Schuyler BS, Mumford JA, Rosenkranz MA, Lutz A, Davidson RJ: **Impact of short- and long-term mindfulness meditation training on amygdala reactivity to emotional stimuli**. *NeuroImage* 2018, **181**:301-313.
8. Fucci E, Abdoun O, Caclin A, Francis A, Dunne JD, Ricard M, Davidson RJ, Lutz A: **Differential effects of non-dual and focused attention meditations on the formation of automatic perceptual habits in expert practitioners**. *Neuropsychologia* 2018, **119**:92-100.
9. Brefczynski-Lewis JA, Lutz A, Schaefer HS, Levinson DB, Davidson RJ: **Neural correlates of attentional expertise in long-term meditation practitioners**. *Proc Natl Acad Sci U S A* 2007, **104**:11483-11488.
10. Brewer JA, Worhunsky PD, Gray JR, Tang YY, Weber J, Kober H: **Meditation experience is associated with differences in default mode network activity and connectivity**. *Proc Natl Acad Sci U S A* 2011, **108**:20254-20259.
11. Lutz A, Brefczynski-Lewis JA, Johnstone T, Davidson RJ: **Voluntary regulation of the neural circuitry of emotion by compassion meditation: effects of expertise**. *PLoS One* 2008, **3** e1897.
12. Lutz A, McFarlin DR, Perlman DM, Salomons TV, Davidson RJ: **Altered anterior insula activation during anticipation and experience of painful stimuli in expert meditators**. *Neuroimage* 2013:538-546.

13. van Leeuwen S, Singer W, Melloni L: **Meditation increases the depth of information processing and improves the allocation of attention in space**. *Front Hum Neurosci* 2012, **6**:133 http://dx.doi.org/10.3389/fnhum.2012.00133.

14. Jensen CG, Vangkilde S, Frokjaer V, Hasselbalch SG: **Mindfulness training affects attention - or is it attentional effort?** *J Exp Psychol Gen* 2012, **141**:106-123 http://dx.doi.org/10.1037/a0024931.

15. Mrazek MD, Franklin MS, Phillips DT, Baird B, Schooler JW: **Mindfulness training improves working memory capacity and GRE performance while reducing mind wandering**. *Psychol Sci* 2013, **24**:776-781 http://dx.doi.org/10.1177/0956797612459659.

16. Zanesco AP, King BG, Maclean KA, Saron CD: **Executive control and felt concentrative engagement following intensive meditation training**. *Front Hum Neurosci* 2013, **7**:566 http://dx.doi.org/10.3389/fnhum.2013.00566.

17. Kuyken W, Hayes R, Barrett B, Byng R, Dalgleish T, Kessler D, Lewis G, Watkins E, Brejcha C, Cardy J, Causley A, Cowderoy S, Evans A, Gradinger F, Kaur S, Lanham P, Morant N, Richards J, Shah P, Sutton H, Vicary R, Weaver A, Wilks J, Williams M, Taylor RS, Byford S: **Effectiveness and cost-effectiveness of mindfulness-based cognitive therapy compared with maintenance antidepressant treatment in the prevention of depressive relapse or recurrence (PREVENT): a randomised controlled trial**. *Lancet* 2015, **386**:63-73.

18. Teasdale JD, Segal ZV, Williams JMG, Ridgeway VA, Soulsby JM, Lau MA: **Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy**. *J Consult Clin Psychol* 2000, **68**:615-623.

19. Segal ZV, Williams JMG, Teasdale JD: *Mind-fulness-based Cognitive Therapy for Depression: a New Approach to Preventing Relapse*. New York: Guilford Press; 2002.

20. Lutz A, Thompson E: **Neurophenomenology: integrating subjective experience and brain dynamics in the neuroscience of consciousness**. *J Conscious Stud* 2003, **10**:31-52.

21. Khachouf OT, Poletti S, Pagnoni G: **The embodied transcendental: a Kantian perspective on neurophenomenology**. *Front Hum Neurosci* 2013 http://dx.doi.org/10.3389/fnhum.2013.00611.

22. Thompson E: **Neurophenomenology and Contemplative Experience**. In *The Oxford Handbook of Religion and Science.* Edited by Clayton E. Oxford University Press; 2008 http://dx.doi.org/10.1093/oxfordhb/9780199543656.003.0015.

23. Thompson E: *Waking, Dreaming, Being: Self and Consciousness in Neuroscience, Meditation, an Philosophy*. Columbia University Press; 2014.

24. Shear J: **Meditation as first-person methodology: Real promise and problems**. In *Meditation: Neuroscientific Approaches and Philosophical Implications.* Edited by Schmidt S, Walach H. Berlin: Springer; 2014:57-74.

25. • Davidson RJ, Kaszniak AW: **Conceptual and methodological issues in research on mindfulness and meditation**. *Am Psychol* 2015, **70**:581-592.

A systematic discussion of the challenges for contemplative science with constructive suggestions for moving forward.

26. Sparby T: **On the nature of contemplative science and some prospects for its future development**. *J Conscious Stud* 2017, **24**.

27. Ellamil M, Fox KCR, Dixon ML, Pritchard S, Todd RM, Thompson E, Christoff K: **Dynamics of neural recruitment surrounding the spontaneous arising of thoughts in experienced mindfulness practitioners**. *NeuroImage* 2018, **136**:186-196.

28. • van Beek M: **All in the brain? Contemplative life and the anatomical theatre of the mind**. In *Anthology - Anatomical Theatre.* Edited by Vinje P. Oslo: Uten Tittel Forlag; 2018:14-23.

An anthropological perspective on the field of contemplative studies.

29. Khalsa SS, Rudrauf D, Damasio AR, Davidson RJ, Lutz A, Tranel D: **Interoceptive awareness in experienced meditators**. *Psychophysiology* 2008, **45**:671-677.

30. Fox KCR, Zakarauska P, Dixon M, Ellamil M, Thompson E, Christoff K: **Meditation experience predicts introspective accuracy**. *PLoS One* 2012, **7** e45370.

31. Berkovich-Ohana A, Dor-Ziderman Y, Glicksohn J, Goldstein A: **Alterations of time, space, and body in the mindfulness-trained brain: a neurophenomenologically-guided MEG study**. *Front Psychol* 2014 http://dx.doi.org/10.3389/fpsyg.2913.00912. 03 December 2013.

32. Lindahl J, Kaplan CT, Winget EM, Britton WB: **A phenomenology of meditation-induced light experiences: traditional Buddhist and neurobiological perspectives**. *Front Psychol* 2014 http://dx.doi.org/10.3389/fpsyg.2013.000973.

33. Sparby T: **Investigating the depths of consciousness through meditation**. *Mind Matter* 2015, **13**:213-240.

34. • Ataria Y: **Where do we end and where does the world begin? The case of insight meditation**. *Philos Psychol* 2014:1-19 http://dx.doi.org/10.1080/09515089.2014.969801.

This study addresses the question of the fundamental experiential mechanisms that create the separation we ordinarily perceive between an "internal" and an "external" world, from the description of the gradual dissolution of this border in the experience of a highly skilled meditation practitioner.

35. Ataria Y, Dor-Ziderman Y, Berkovich-Ohana A: **How does it feel to lack a sense of boundaries? A case study of a long-term mindfulness meditator**. *Conscious Cogn* 2015, **37**:133-147.

36. Lutz A, Jha AP, Dunne JD, Saron CD: **Investigating the phenomenological matrix of mindfulness-related practices from a neurocognitive perspective**. *Am Psychol* 2015, **70**:632-658.

37. • Przyrembel M, Singer T: **Experiencing meditation – Evidence for differential effects of three contemplative mental practices in micro-phenomenological interviews**. *Conscious Cogn* 2018, **62**:82-101.

The study uses the micro-phenomenological interview method to detect experiential patterns associated with different kinds of meditative practice, and transforms these patterns into specific codes enabling performing quantitative analyses on these qualitative data.

38. Philippot P, Segal Z: **Mindfulness based psychological interventions. Developing emotional awareness for better being**. In *Ten Years of Viewing from Within. The Legacy of Francisco Varela.* Edited by Petitmengin C. Exeter: Imprint Academic; 2009:285-306.

39. Lachaux JP: **If no control, then what? Making sense of 'neural noise' in human brain mapping experiments using first-person reports**. *J Conscious Stud* 2011, **18**:162-166.

40. • Tulku Urgyen Rinpoche: *As It Is*. Hongkong and Esby: Rangjung Yeshe Publications; 1999, 2000

Teachings on the Buddhist path in the Tibetan Vajrayana tradition by one of the most respected 20thth century masters of meditation.

41. Vermersch P: *L'entretien d'explicitation*. Paris: ESF; 1994/2017.

42. Vermersch P: **Describing the practice of introspection**. In *Ten Years of Viewing from Within. The Legacy of Francisco Varela.* Edited by Petitmengin C. Exeter: Imprint Academic; 2009:20-57.

43. Vermersch P: *Explicitation et Phénoménologie*. Paris: PUF; 2012.

44. Petitmengin C: **Describing one's subjective experience in the second person: an interview method for the science of consciousness**. *Phenomenol Cogn Sci* 2006, **5**:229-269.

45. Petitmengin C: **The intuitive experience**. In *The View from Within. First-Person Approaches to the Study of Consciousness.* Edited by Varela F, Shear J. Exeter: Imprint Academic; 1999:43-77.

46. Petitmengin C, Remillieux A, Valenzuela C. Discovering the structures of lived experience. Towards a micro-phenomenological analysis method. To appear in *Phenomenol Cogn Sc*.

47. Petitmengin C, Bitbol M: **The validity of first-person descriptions as authenticity and coherence**. *J Conscious Stud* 2009, **16**:363-404.

48. Petitmengin C, Remillieux A, Cahour C, Carter-Thomas S: **A gap in Nisbett and Wilson's findings? A first-person access to our**

**cognitive processes**. *Conscious Cogn* 2013, **22**:654-669 http://dx.doi.org/10.1016/j.concog 2013.02.004.

49. Bitbol M, Petitmengin C: **A defense of introspection from within**. *Construct Found* 2013, **8**:269-279.

50. Bitbol M, Petitmengin C: **On the possibility and reality of introspection**. *Mind Matter* 2016, **14**:51-75.

51. Bitbol M, Petitmengin C: **Neurophenomenology and the micro-phenomenological interview**. In *The Blackwell Companion to Consciousness,* 2nd edition. Edited by Schneider S, Velmans M. Wiley & Sons; 2017.

52. Killingsworth M, Gilbert D: **A wandering mind is an unhappy mind**. *Science* 2010, **33**.

53. Farb N, Daubenmier J, Price CJ, Gard T, Kerr C, Dunn BD, Klein AC, Paulus MP, Mehling WE: **Interoception, contemplative practice, and health**. *Front Psychol* 2015, **6**:763 http://dx.doi.org/10.3389/fpsyg.2015.00763.

54. Petitmengin C: **Enaction as a lived experience. Towards a radical neurophenomenology**. *Construct Found* 2017, **12**:139-147.
•

A presentation of "radical neurophenomenology", a project aiming at investigating the process of co-constitution of the subjective and objective poles, within lived experience, through the micro-phenomenological exploration of the emergence of a perception or an idea.

55. Petitmengin C: **Discovering the microgenesis of the hard problem**. *Construct Found* 2017, **12**:159-162.

56. Bitbol M: *La conscience a-t-elle une origine*. Paris: Flammarion; 2014.