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What is Absent from Contemplative Neuroscience?

Rethinking Limits within the Study of Consciousness, Experience, and Meditation

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In conveying experiences of meditation, the question of what exceeds or should resist description has been a recurrent topic of commentary in a wide array of literature—including religious doctrine, meditation guides (secular and religious), and contextual accounts written by historians and social scientists. Yet, to date, this question has not significantly informed neuroscientific studies on the effects of meditation on brain and behaviour, in large part—but not wholly—because of the disregard for first-person accounts of experience that still characterizes neuroscience in general. By juxtaposing perspectives from non-neuroscientific accounts on the tensions and questions raised by what is *and* is not *expressed or expressible in words, this article paves the way for a new set of possibilities in experimental contemplative neuroscience.*

1. Introduction

Attempts scientifically to demonstrate the effects of meditation on brain and behaviour have been undertaken for decades (see Andresen, 2000), but in recent years the literature on this topic has burgeoned. The neuroscientific study of meditative practices is now part of a field known as 'contemplative neuroscience'. Particular attention in this field has been paid to meditation associated with Buddhist traditions and with secular Buddhist-inspired practices, such as 'mindfulness'. Attempts to assess the state of research have noted that there is evidence that meditation changes behaviour, brain activity and even brain structure, but also that there are methodological challenges associated with documenting meditation and its effects in experimental design conditions (Chen *et al.*, 2012; Tang *et al.*, 2015). Among these is the challenge of how to relate to practitioners' accounts of their lived experiences during meditation (hereafter referred to as 'meditative experiences').

In this article we argue that the recognition of concerns associated with putting experience into words can enable further possibilities for neuroscientific research. Outside the neuroscientific literature, the question of what escapes, exceeds or resists description has been a recurring topic of commentary—both in relation to meditation, and more generally (Franke, 2007). Indeed, in doctrine and philosophical analysis, in guides on meditation, in autobiographical accounts, and in sociological and anthropological studies, cautions regarding recounting experience are seen as integral to what it means to achieve a significant level of awareness and to convey one's understanding of contemplative matters. Not so within contemplative neuroscience, where little attention has been given to what is absent from accounts of meditative experience because it cannot be, is difficult to, or should not be, put into words. Whereas, as we shall see, a few studies have gone against the grain of the primarily quantitative cognitive-behavioural paradigm, and have begun to use qualitative methods to inquire into the subjective experience of meditating, to date little (if any) consideration has been given to what aspects of this experience practitioners cannot or choose not to describe.

This article discusses the limits of the verbal accounting of meditative experiences as a heuristic to challenge how to relate to practitioners' accounts of meditative experiences in contemplative neuroscience. It thereby draws on works that treat what is absent not as a void or negative, but as an active and constitutive element of interaction (Rappert, 2015), in a bid to explore what this

might yield in terms of new directions for science. Paying attention to absence will enable us to question certain assumptions in contemplative neuroscience. It will also allow us to ask non-conventional questions, in particular questions that turn the limits of expression into a topic of empirical study. These questions can, in turn, provide insights and ideas useful for experimental neuroscientific research.

We develop our argument as follows. In section 2 we review some of the promises associated with the renewed round of attention to the effects of meditation on human brain and behaviour initiated in the late 1990s. In particular, we revisit the aspirations and agendas specified by Varela (1996) and Andresen & Forman (2000) for a multidisciplinary approach to the study of contemplative experience. We highlight how our approach, which is based on thematising what is absent from accounts of the experience of meditation across various domains of knowledge and genres of expression, relates to their aspirations and agendas. In section 3 we provide an overview and analysis of the tensions associated with recounting meditative experience, as gleaned from doctrine and practical guidance on how to meditate, first-person accounts of meditative journeys, and social and cultural analyses of meditation and research experimentation. In section 4 we turn to current and future research in contemplative neuroscience and distinguish different approaches in it. We show that some researchers in this field have emphasized the need to inquire into the subjective experience of meditation in order to interpret brain activity, and have started to do so. However, as we also point out, this approach has not (at least yet) showed much consideration for the tensions and limits (acknowledged in other domains) in recounting meditative experience. In section 5 we offer some preliminary ideas for approaches in contemplative neuroscience that would display greater sensitivity to the concerns outlined in section 3. These ideas will need to be refined in dialogue with experimental scientists, and we hope that our discussion can serve as a provocation and stimulus for such dialogue.

2. The Call for a Multidisciplinary Approach to Contemplative Experience

The challenges associated with the study of meditation, and the question of what sort of research agendas are needed in response to them, have been matters of long-standing commentary. To mention two sources of inspiration highly relevant to *JCS*, both Varela (1996) and Andresen & Forman (2000) had ambitious integrative research agendas for the multidisciplinary study of experience. Varela (1996) famously advanced the proposal for an integrative research programme he dubbed 'neurophenomenology'. As the term suggests, he advocated combining quantitative

neuroscientific methods for the generation of third-person data about brain activity (e.g., neuroimaging techniques such as fMRI and PET) with phenomenological methods that would provide first-person data about a person's lived experience. In Varela's vision, phenomenologically trained subjects would be able to produce detailed reports about experience that could help scientists interpret brain activity. Vice versa, brain measurements could be used to refine self-observation and experiential reports in a process of 'circulation' and 'mutual constraints'. Varela also highlighted the situated and social-practice aspects of both first- and third-person accounts, claiming that 'so-called third-person, objective accounts are done by a community of concrete people who are embodied in their social and natural world as much as first-person accounts' (*op. cit.*, p. 340).

Similarly, and even more broadly, in a Special Issue of *JCS* on religious and spiritual experience, Andresen & Forman (2000) advocated drawing on the methods and analyses of 'the myriad disciplines' contributing to the study of consciousness—such as neuroscience, physiology, philosophy, cognitive science, psychology, and anthropology. In their view, only a rich interdisciplinary approach could do justice to the complexity of religious experiences. In line with this outlook, they listed four main domains for the study of religious experience (*op. cit.*, pp. 10-12):

> 1) *doctrinal analysis*: textual and historical examination of how divine messages are revealed through human language and concepts;
> 2) *social expression*: understanding of how religious experience is an outcome of social, cultural, institutional and interpersonal dynamics;
> 3) *subjective experience*: examination of the qualities of the lived character of religious experience;
> 4) *scientific research*: efforts to determine the biological correlates of religious experience.

Each of these domains, they argued, provides important knowledge about religious experience, as well as aligned methods and findings. A proper understanding of religious experience would bring together researchers from these different domains to examine how various doctrinal, social, subjective, and scientific factors influence one another. For example, researchers considering how cultural background, religious training and socialization 'set up situations and influence our ability to have most experiences, including many mystical ones' (p. 9) could team up with others examining how first-person religious experiences influence the belief system of a person, a group, or (in the case of particularly influential religious leaders) an entire culture. The

vector of influence would thus be considered in both directions, and this could be done for each of the four domains of inquiry.

Both Varela's call for a rigorous study of experience that combines first- and third-person data, and Andresen & Forman's call to foster bi-directional influences between domains provide models for interdisciplinary research. The approach we adopt in this article retains these authors' basic convictions that it is best to avail ourselves of insights from multiple relevant domains if we wish to do justice to the complexity of meditative experiences.[1] The orientation we follow here is one of tracking a broadly defined problem through various incarnations across disciplines and contexts of inquiry. Our guiding question thereby is: '*What are the limits to putting meditative experience into words?'*. We ask what can be learned by attending to these limits as set out in doctrinal texts, by those guiding others in the pursuit of meditation, and in the negotiations between expert meditators and researchers wishing to study their practices. The shape of such an excursion is indicated in the following section, after which we consider its implications for current and future research in contemplative neuroscience.

3. Indicating Limits in Accounts of Meditative Experience

The aim of this section is to show that the question of how to relate to meditative experience—and in particular to what is not, cannot or should not be said about it—has been a topic of commentary and debate in several disciplines and varied contexts of inquiry. Given the complexity of this topic, our discussion will be selective and indicative; it will point to different incarnations of the problem of putting meditative experience into words, as well as surface tensions and disagreements. Driven primarily by the intention to suggest new possibilities for neuroscience, we put a range of considerations on the table, and indicate these as matters of in-situ negotiation or unsettled debate. In particular, we limit our discussion primarily to Buddhist meditation—and even here we provide only a selection of the relevant literature and ideas.

To start, it should be noted that 'Buddhism' comprises many systems of thought and situated practices that have varied significantly over time and space, and much the same can be said about meditation within Buddhist traditions. The place of meditation as a source of insight and as the basis for Buddhist doctrine has been subject to varied treatments over time, between traditions, within traditions depending on one's status, as well as across geography (e.g., Lopez Jr., 2008). Compounding an already complicated picture is the diverse range of translated meanings that

have been associated with central Buddhist terms like 'mindfulness' (Gethin, 2011), which have been taken up in a variety of more or less secular practices in North America, Europe, and elsewhere.

Our discussion of what is not, cannot or should not be said about meditation is organized into three subsections:

(1) ways in which doctrinal and philosophical analysis, as well as more popular treatises on Buddhism and guides for meditative practice, have problematized putting experience into words;
(2) ways in which accounts of meditative experience vary over time and across settings;
(3) particular patterns of accounts that have emerged in collaborations between Buddhist meditators and neuroscientists, and other experimental studies.

3.1 Limits of accounts as a topic in doctrine and guidance for meditation practitioners

Figures within Buddhism and scholarly commentators have long discussed whether meditative experiences (in some instances only extraordinary ones, but in other instances a much wider range) can and should be captured by meditators through words, and whether they can and should be communicated to others. In some traditions, such as Zen Buddhism, cultivating habits of reflecting and talking about one's meditation experience is regarded as interfering with the latter, especially in the case of practices intended to produce non-conceptual, non-discursive 'empty' experiences. In this tradition, monks are often required to stop reading texts about meditation during periods of intensive practice.[2]

The teachings of the Buddha already refer to the potential reductions and dangers associated with putting experiential insights into words. In the Surangama Sutra, the Buddha warns of how non-enlightened minds can become engrossed in the teachings, mistaking them for awakening itself—in the same way that individuals can fixate on a finger that points to the moon rather than looking at the moon (see Ho, 2008, p. 160). Yet, in spite of these warnings, the teachings use language to talk about experience and its limits. The manner in which this is done has invited different interpretations about what can become known through words about meditative insights.

Consider for instance the debate between Tsong khapa (1357-1423) and Go rampa (1429-1489) as examined in Thakchoe (2007). Both were exegetes within the Tibetan Madhyamaka tradition, in which meditation is treated as necessary to realizing ultimate truth. Both agreed that ultimate truth is nondual and as such transcends the conventional subject-object distinction. They differed, however, in the role they attributed to conceptual thought (and thus, we can extrapolate, to language) in realizing ultimate truth. According to Tsong khapa, ultimate truth is realized through the mutual support of conceptual and non-conceptual thought; conceptual thought helps provide access to ultimate truth, but is not sufficient. According to Go rampa, on the other hand, only non-conceptual thought is capable of realizing ultimate truth, and must operate 'entirely without reliance on any empirical [conventional, conceptual] epistemic resources' (Thakchoe, 2007, p. 136). Conceptual thought is incompatible with the nondual nature of ultimate truth and thus needs to be entirely transcended. As such, whereas in Tsong khapa's approach there seems to be room for language to collaborate with non-conceptual understanding to lead to ultimate truth, in Go rampa's approach language can only be an obstacle.

The notion that some forms of experiential insight are indescribable, and thus cannot be conveyed to other people, has also been a prominent theme in many contemporary Western scholastic analyses of Buddhism (e.g., Kasulis, 1981). Cultivating Buddhist-inspired wisdom thus requires appreciating the limits of words and the need to move beyond them (even if one may use words to call attention to this need; see Burton, 2000). The notion that some forms of insight are indescribable has also been a prominent theme in more popular portrayals, such as D.T. Suzuki's philosophical depiction of Zen Buddhism, with its frequent and evocative refutations of the idea that Zen can be described (e.g., Suzuki, 1949).

The insistence that ultimate truth is non-conceptual in nature relates to discussions about the *ineffable*. Within self-accounts, those experiences which language cannot capture often figure as peak experiences of insight (Lerner, 1977, pp. 60, 72, 100, 127). Against those positing or subscribing to notions of the 'ineffable', others have specified and listed various states or levels of experience, including the succession of stages that lead to higher-order insights (as in Goleman, 1988; Shear, 2014).[3] For instance, Brown (1977) examined how texts in the Tibetan *MuhGmudru* tradition specify experiential states attained during both initial and adept levels of meditation. He did so in order to counter popular beliefs that meditative or mystical states (be they ordinary or extra-ordinary in character) are 'ineffable'. Instead of placing them beyond words, Brown offered a 'phenomenology of meditative experience' (p. 238). However, despite

this stated goal, he also acknowledged that certain higher-order states discussed in *MuhGmudru* (such as the notion of 'subtle energy') are too complex to be described—even though they are the 'starting point of meditative insight' (p. 261) for advanced practitioners. More widely, different evaluations have been provided of whether central but multiply interpreted states of meditative experience within Buddhism, such as 'nirvana', can be described (Albahari, 2011).

Turning from what *cannot* to what *should* not be said, in the Buddhist-inspired secular context of Mindfulness-Based Stress Reduction, through the writings of Jon Kabat-Zinn, novice meditators are instructed to fight the impulse to advertise their meditation practice to others: 'If you do decide to start meditating, there's no need to tell other people about it, or talk about why you are doing it or what it's doing for you. In fact, there is no better way to waste your nascent energy and enthusiasm for practice and thwart your efforts so they will be unable to gather momentum' (Kabat-Zinn, 1994, p. 29). Here, the issue is not ineffability but the distraction that results from keeping a running commentary during meditation practice—in Kabat-Zinn's words, 'more thinking'—which detracts from staying with one's moment-to-moment awareness as it unfolds.

Scholars have also pointed out that there may be pedagogical reasons why one should not talk about the experience of meditation. Some people may not be able to appreciate what they hear about meditative experience if their own contemplative progression has not prepared them (Herrigel, 1999, p. 23). Thus, experienced meditators are warned that they may inadvertently hamper the progress of relative novices when talking about higher states of consciousness, because such descriptions may reinforce delusional thinking, set up expectations for what 'should' be experienced, and romanticize the practice of meditation (Kornfield, 2001). Accordingly, the decision of talking about meditative experience depends on the situation and on whom one is talking to.

For present purposes, while the points above only offer the briefest of treatments, they illustrate that the communication of meditative experiences and related states of consciousness is not an uncontroversial activity within Buddhist texts and their interpretation, and within (Buddhist-inspired or secular) meditation guides.

3.2 Accounts of meditative experience as varying over time and setting

In this sub-section we review some of the considerations informing the expression of meditative experiences in social situations where such expression is deemed salient, and also potentially problematic. These considerations inform individuals' decisions on what to say and to whom, and they prompt us to question what has been stated about experience.

To begin, we can note that communal mores have had a bearing on decisions about what should be disclosed about the details of meditation practice—as is highlighted in accounts of early attempts to enrol Buddhist monks in scientific research relating to meditation. A case in point is the story of senior Tibetan monks in retreat on Bhagsu Mountain, who were approached by a team of scientists in 1992 (Houshmand *et al.*, 2002; Harrington, 2008). One by one, the monks denied to have achieved any significant spiritual attainment, and politely declined to expand on their meditation practices. Given that they were recommended by the members of the Council for Religious and Cultural Affairs of the Tibetan government-in-exile, this outcome was very surprising to the scientists. They eventually learned that the monks' reluctance stemmed from monastic prohibitions against extolling one's spiritual accomplishments or comparing them with others'. In addition, the monks were not convinced that supporting the cause of science would be as important as continuing to focus on their own progress towards enlightenment.

The latter is a complicated issue. Paine (2004, p. 202) tells of the Dalai Lama publicly changing his mind on this matter in 1979, moving from the view that engagement with scientists would be a distraction for senior monks, to the argument that 'our friends to the East [the Chinese] might be impressed with a Western explanation of what we are doing' (see also Harrington, 2008).[4] In the late twentieth-century, meditation and its scientific explanation became a form of 'soft power', a way to ensure the survival of Tibetan Buddhism at a time of its repression in its homeland (see Whalen-Bridge 2015).[5] What is and is not conveyed about the lived experience of meditation is thus a situated, negotiated, and to some extent dynamic, matter.

This has been so in relation to face-to-face encounters too. Jordt (2007, chapter 2) draws on the pedagogical manual for the tradition of Satipatthana Vipassana meditation, devised in twentieth-century Burma, to elucidate the periodic interviews that teachers were meant conduct with students amidst long periods of sitting and walking meditation. In the interview situation, students' verbal expression of their experience of meditation is constituted interactively and

pedagogically. The teacher seeks to distinguish, and to train the student in distinguishing, what the student has authentically experienced from what he or she narrates based on conceptual knowledge gained by reading or hearing about the experiences of other people. The manual suggests a variety of follow-up questions and 'tests' to allow '[t]he experience and the idea-of-the experience [to be] distinguished according to the depth and exactitude of the yogi's cultivated observational skills' (Jordt, 2007, p. 73). Making this distinction requires much expertise and carries high stakes, as incorrect assessments about progression are treated as having karmic consequences for both student and teacher (Jordt, 2007, p. 70).

Others have argued that the very categories of meditative experience are contextually contingent. As Sharf (1995; 2000) has contended, scholars and practitioners of religion refer to the perception of discrete and definite 'inner' qualitative experiences. In this, experience is treated as a given 'it' (even if it may be difficult to put into words). One of the ways Sharf criticizes such thinking is to marshal empirical observations in order to show that multiple 'its' are represented by the same terminology. For instance, as he argues in the cases of Vipassana meditation and Zen Buddhism, the meaning of the prevalent experiential categories and terms has changed over time and has been contested amongst adept masters, suggesting that there is no ultimate agreed referent. Sharf also contends that many of the labels used to refer to experience (such as Suzuki's notion of 'pure experience') are fairly recent inventions tailored to make sense to Western audiences. On the other hand, Shedneck's study of Thai meditation teachers provides grounds for downplaying the relevance of Sharf's arguments. As she notes, at least some teachers of Theravada Buddhism in Thailand's international meditation centers consider it both effective and legitimate to use secular, universalizing, therapeutic-psychological language when teaching meditation to foreigners (Shedneck, 2015). They argue that 'Western psychology is a useful translator and stepping stone to understand deeper Buddhist concepts' (*op. cit*, p. 134, n11), and that such translation does not affect 'the experience of insight itself', which is fundamentally beyond language in any case (p. 147). Herein, the focus is not with the extent of the representational correspondence between words and experience, but with how terminology pragmatically serves the goal of advancing the process of awakening.

In sum, then, in this sub-section we have illustrated that what *is* and *is not* said about the lived experience of meditation intersects with concerns for tradition, authenticity, survival and truth, against the backdrop of ongoing changes to the communities and circumstances in which Buddhism is practiced.

3.3 Patterns of accounts in collaborations between Buddhist meditators and experimental studies

Attempts scientifically to identify and study the effects of meditation raise questions of their own about how experiences are and should be recounted, and about the interplay between what is and is not put into words about meditative experience. At stake are questions about the compatibility between science and meditation, as well as whether meditation in itself can be regarded as a form of scientific method (Schmidt & Walach, 2014a).[6]

Consider then some contrasting orientations to descriptions of meditative experience. In multiple book-length analyses, Austin (1998, 2006) has sought to bring together his training in Zen Buddhism and neurology. While making reference to William James's ([1902] 1925) analysis of the ineffability of experience, as well as D.T. Suzuki's writings regarding how words distract from understanding Zen, Austin 'points the way' towards Zen by recounting a number of his own personal experiences of altered states of consciousness—such as selflessness and *samadhi* (mental tranquillity) (e.g., Austin, 2006, pp. 353, 407-409, 479). He offers such first-person accounts in addition to reports and analyses of meditation stages and states (such as varieties of 'oneness'). For Austin, identifying his own altered experiential states provides a basis from which to circulate between third-person human neurological and physiology data, and first-person accounts (in this case his own; see also Austin, 2016), while still acknowledging that not all experiences can be rendered in words.

Contrast this orientation to experience with that of another person possessing a dual identity that spans both science and Buddhism. The first chapter of Goleman's (2003) popular book *Destructive Emotions* has served as an emblematic account of collaboration between experimental scientists and Buddhist monks (see, e.g., Ricard, 2007; Levenson *et al.*, 2012). Goleman describes a battery of exceptional test results in 2000 for Matthieu Ricard, a French Buddhist monk with a PhD in molecular genetics. What is worthy of note for the purposes of this article is how Ricard's lived experience is absent from the scientifically oriented descriptions of those experiments (see Rappert *et al.*, 2016). Whereas it is said that he entered into particular meditative states, no description is given of the lived qualities or character of those states. Instead, terms like 'compassion' and 'concentration' are used as generic labels to designate discrete and definite states. Even in his autobiographical account of the 2000 experiments, Ricard (2007) uses generic labels, and at times even third-person language, to report his experience of the experiments

through a conventional scientific style.[7] As we develop further in section 4, the citation of labels rather than description of experience is still prevalent in contemplative neuroscience. What the lack of first-person descriptions of lived experience means in the case of Ricard is that he and others sidestep potentially thorny questions about the relationship between Buddhist vocabularies for experience, and Western scientific vocabularies for neural and physiological measurement.[8] It thus also has the effect of reducing the need to enter into debates about what can and cannot, should or should not, be put into words.

The lack of attention to first-person descriptions also obscures the ways in which interactions within experimental settings may affect accounts. Elsewhere, the interaction between experimenters and participants has become associated with producing particular patterns of description. In a detailed study of the language of introspective reporting in psychological experiments (not related to meditation), Wooffitt & Holt (2011) showed that participants' management of speech and silence indicate that they are sensitive to the requirements of the setting (for example, the fact that the experimenter is taking notes), act out common-sense understandings of the phenomenon under investigation (e.g., the speed and rhythm with which images would appear in their consciousness), and appreciate the obligations of a 'proper' research subject (e.g., by verbalizing that there is 'nothing to report' so that the researcher knows the subject is still attentively watching his or her experience). Self-reporting, Wooffitt & Holt argue, is a form of social action: the interplay of verbalizations and silences serves to coordinate participants and experimenters.

This last point brings us back to Varela's (1996) argument about individual experience being an intersubjective, rather than an entirely 'private' phenomenon. Wooffitt & Holt go further though in their orientation to language, an orientation held widely in the social sciences that can be labelled as a 'discursive' (see Edwards 1997). Here, rather than treating language as a means of (more or less accurately) representing experience, 'to *say* something' is treated as a way 'to *do* something' (Austin 1962, p. 12). In the experimental setting this means that, as managed social actions, descriptions should be understood as given in such kinds of interaction settings, and their meaning needs be understood as a form of action that helps constitute what counts as an experiment (and, as part of this, the roles of experimenters and participants). As a result, for Wooffitt & Holt, along with others that adopt a discursive approach, it is naïve to treat description as simply a mapping experience. In section 5 we consider proposals for future

research attentive to the assumptions of both representational and discursive orientations to language.

These brief examples serve to indicate different ways in which scientific collaborations limit the description of meditative experience. In some cases, lived experience drops out of view altogether—even if the persona and abilities of the meditator do not. In others, it is circumscribed as a gateway to scientific explanation. Meanwhile, discursive approaches such as the one by Wooffitt & Holt draw attention to the performance of speech and silence about first-person experience as a form of action within a specific *inter*action.

The discussion in this section has provided a range of responses, from various kinds of literature, to the question of '*What are the limits to putting meditative experience into words?'*. We have seen that the verbal communication of meditative experiences and related states of consciousness is not unequivocally encouraged within Buddhist texts and their interpretation; that putting experience into words (and what vocabularies are chosen) is evaluated differently—and is a matter of ongoing adjustment—across places and times; and that there are multiple ways in which scientific settings produce limits to verbalizing experience. In the following two sections we bring these varied yet overlapping problematizations in conversation with ongoing work on the integration of first-person reports in contemplative neuroscience.

4. Experience in Contemplative Neuroscience

We turn now to, first, how experiences of meditation have been rendered within neuroscientific research and, second, how an expanded consideration of limits and absences could inform such research in the future. As we show in this section, in line with Varela's (1996) neurophenomenology (section 2), contemplative neuroscience has begun to rely on participants' experiential reports to make sense of brain activity during meditation. In so doing, it has started to address notable gaps in the dominant cognitive-neuroscientific paradigm, which typically adopts primarily a quantitative approach and does not include asking participants about their experiences in any depth.

Most significantly for present purposes, the introduction of a neurophenomenological approach within contemplative neuroscience has provided a starting platform for addressing the

complexities of what is *not* said about experience—and, as we argue below, there is scope for enriching this approach further.

We can distinguish three attitudes toward experience and self-reports in contemplative neuroscience. The first one characterizes the dominant paradigm, and typically involves measuring brain activity in participants engaged in a cognitive-behavioural task, without asking them anything about their experience (for recent examples of this approach, see Ahani *et al.*, 2014; Gard *et al.*, 2015; Pasquini *et al.*, 2015; Taren *et al.*, 2015; Villemure *et al.*, 2015). This attitude is in line with a long tradition in psychology and cognitive science that regards introspection and self-reports as unreliable and non-scientific. Interestingly, scientists working within this paradigm occasionally call for more attention to experience and self-reports—although typically in a cautious and under-developed way, in the final paragraphs of scientific publications discussing 'questions for the future'. For example, in their otherwise extensive review of the neuroscience of mindfulness meditation, Tang *et al.* (2015, p.222) briefly note that 'interpretations of study outcomes remain tentative until they are clearly linked to subjective reports', but do not provide suggestions for how to realize this link.

The second attitude characterizes what we call 'thin' neurophenomenological studies (see also Rappert *et al.*, 2016). These studies aim to correlate brain activity with pre-established experiential categories. Experimenters here typically ask participants to enter into a specific meditative experiential state, and measure their brain activity while they are sustaining such state. For example, Lutz *et al.* (2004) asked participants with different levels of expertise (long-term Buddhist meditators and novices) to generate an experience of 'pure compassion', characterized as 'unrestricted readiness and availability to help living beings' (p. 16369), and compared brain activity during this task. This approach is 'neurophenomenological' because it relies on experience to make sense of neurophysiological data. Yet we characterize it as only 'thinly' neurophenomenological, because it does not involve asking participants to talk about their practice and experience; it just requires that they enter a certain pre-identified experiential state and at most rate their immersion in it, and signal when they are out of it. This approach can certainly be useful and productive. For example, Berman & Stevens (2015) recently adopted it to show that nondual states of awareness in meditators from different traditions correlate with the same pattern of EEG activity (see next section for more details; for another fruitful application of 'thin' neurphenomenology, see Lutz *et al.*, 2002).

In addition, recently a few studies have adopted a third, more complex and complementary attitude toward participants' experience, which we characterize as neurophenomenologically 'thick'. These studies employ qualitative methods from psychology and the social sciences to collect rich first-person data. In our view, they successfully integrate such methods with the quantitative ones of neuroscience, eventually identifying important specific categories of experience and their neural underpinnings. Thus consider the study conducted by Dor-Ziderman *et al.* (2013) on different states of self-awareness in long-term Vipassana meditators. Here, participants were asked to enter three different 'self-related' states, including a 'selfless condition' in which they had to try to be aware of the present moment without however experiencing themselves as subjects of experience. Importantly, in addition to adopting standard measures of self-reports involving Likert scales, the experimenters interviewed participants, asking them to describe their experience during the task 'freely and in their own words, without reflection or judgment' (p. 4). They found that, for the 'selfless condition', participants gave descriptions that could be grouped into three categories. Of these, one category (labelled 'lack of ownership') turned out to be associated with a distinct neural signature.[9] A similar methodology characterizes Garrison *et al.*'s (2013) study. They also asked participants (long-term meditators, including some non-Buddhists) to describe their experience in their own words via open-ended questions. By using grounded theory (a widespread inductive qualitative approach in the social sciences that entails starting from participants' accounts to build conceptual categories and theoretical schema), the experimenters were able to extrapolate several categories of experience, which they used to identify and interpret specific patterns of brain activity. These studies illustrate a 'thicker' neurophenomenological approach than the one described in the previous paragraph, because the experimenters collected relatively detailed verbal self-reports from participants to identify specific categories of experience, which they used in turn to interpret brain activity.

In our view, these recent developments are particularly promising, because they open up a space in contemplative neuroscience where it becomes possible to (at least begin to) address the considerations regarding the 'not said' we highlighted in the previous section. For example, it becomes possible to ask participants about their attitude towards the tasks they are required to perform, about difficulties they might encounter when having to report their experiences, about their awareness of contextual constraints, and so on. In this way, questions pertaining to what cannot or should not be said about meditation, together with an enhanced sensitivity towards the participants' background, tradition, and history of meditative training, can become part of the neuroscientific inquiry (see next section for more specific suggestions).

Promoters of the neurophenomenological approach themselves have paid little heed to this possibility. When limits have been identified and recognized as part of experimental research, the approach advocated has been one of rendering lived experience *as explicit as possible*. This orientation is apparent in the 'explicitation interview' developed by Vermersch, Petitmengin and others, including Varela (see Depraz *et al.*, 2003; Petitmengin, 2006). In this interviewing method, the interviewer's role is to keep redirecting the interviewee's attention to her lived experience as it occurred in the past (immediate or remote), and to help her make explicit previously implicit or un-thematized aspects of such experience. This method requires the interviewer to 'probe' experience in as much depth as possible, gently soliciting the interviewee to relive a certain moment again and again, so that she may note aspects of the experience that were not apparent during initial rounds of self-observation and self-reporting. Promoters of this method have sometimes shown awareness of the difficulties associated with putting experience into words. Echoing some of the Buddhist themes given in the previous section, Petitmengin & Bitbol (2009, p. 389) note that 'words … don't display experience, they only point at it' and warn that, in becoming absorbed in verbal descriptions, individuals may lose sight of their experience. And yet, this consideration has generally not led promoters of the explicitation interview to make the limits of verbal expression into an object of inquiry, or at least to recognize the need for *caution* about the possibility or advisability of trying to capture certain experiences through words; nor have these scholars treated what participants do *not* say about their experiences as potentially indicating an awareness of their awareness.[10] Rather, they have strived for the development of ever more refined techniques of representation to help people become aware of otherwise implicit experiences, and to report on them in as much detail as possible. Arguably, then, this approach has given primacy to what can be verbalized (over what cannot) in other ways too, given that interviewing methods to extrapolate categories of experience invariably rely on what gets said, rather than on what is, can, or should not be said.

5. Future Agendas for Contemplative Neuroscience

How, then, might the theme of the 'not said' about meditative experiences inform future research in contemplative neuroscience? How can neuroscientific studies display a greater sensitivity to the issues we presented in section 3? We now offer some ideas, with the proviso that they are at this stage preliminary and would need to be refined in dialogue with experimental neuroscientists. Our main goal here is to stimulate further reflections on how to develop a thick

neurophenomenological approach to meditation that is sensitive to the limits of putting meditative experience into words, as discussed in contexts outside contemplative neuroscience.

1. *Attitudes*. We saw in section 3 that there are different attitudes toward verbalizing meditative experiences, and we identified various reasons for this—from different philosophical assumptions about the relation between conceptual thought and lived experience, to practical and pedagogical concerns about how most effectively to learn/teach meditation, to sociocultural and scientific norms. As a first step, it would thus seem important to understand whether and how these different attitudes affect how participants relate to the task of recounting meditative experience in the experimental context. Differences in training and tradition, sociocultural background, assumptions about 'Western science', as well as interpersonal dynamics in the experimental setting may well influence the ability and willingness of meditators to talk about their experience, and how they eventually do so. Experimental research, we think, would have much to gain from explicitly acknowledging and addressing these possibilities and, accordingly, from taking participants' practical and theoretical background into consideration, discussing with them their attitude toward talking about the experience of meditating, and using this information to design and refine experiments, or at least to decide how to analyse data. At the very minimum, it seems that contemplative-neuroscientific publications describing a neurophenomenological approach could at least mention some of these complexities.

2. *Ease/difficulty*. Relatedly, it would also seem important to take into account how easy or difficult participants find it to talk about various aspects of their meditation practice and accompanying experiences. The invitation here is to resist the temptation to assume that all participants recognize and verbalize meditative experiences with the same degree of ease and confidence, and irrespective of the details of the experimental setup. It may be that reported ease/difficulty varies across participants depending on hours of practice, type of training and meditative tradition, philosophical assumptions, and nature of the experience under study. Additionally, and in line with the findings of Wooffitt & Holt (2011) mentioned earlier, the ease of recounting experience (and even the willingness to offer any report at all) may depend on the interactional dynamics of the experimental setup, including with whom participants are asked to interact in the course of a study (e.g., spiritual teacher, scientist, other). Our suggestion is that a neurophenomenologically thick contemplative neuroscience could show some sensitivity to these possibilities, and attempt to address them in the experimental context. A first step in this direction could involve identifying experiences that are reportedly easier to put into words than

others, and exploring whether there are distinctive neural differences between them and other experiences that are pointed to as harder to express. A further step could involve identifying the conditions that appear to make it easier for subjects to talk about their experiences.

3. Ineffability. Following immediately from the previous point, it would also be interesting to investigate experiences that participants report to be *impossible* (not just difficult) to put into words (i.e., experiences that appear to be 'ineffable'). Experimenters could use qualitative phenomenological methods to explore these cases in some detail. Do participants find it impossible to talk about a certain experience because they feel they lack the appropriate vocabulary? Or is it the case that nothing can be said about a certain experience because of its nondual, objectless nature—as with states of 'pure, contentless awareness … completely devoid of all determinate phenomenological contents' (Shear, 1994, p. 320)? Are there, in other words, different experiences of 'ineffability' and, if so, can they be identified? And do different experiences of ineffability, if any, correlate with distinctive patterns of neurophysiological activity?

One could also carry out a neurophenomenological investigation into the *phases* leading up to, and/or following from, experiences identified as ineffable. What happens in experience before and/or after an experience that cannot be put into words? And what happens at the neurophysiological level? To illustrate this idea more concretely, consider the 'thin' study by Berman & Stevens (2015), briefly mentioned in the previous section. The experimenters here looked at the EEG neural signatures of nondual states of awareness, defined as 'absent of phenomenological content, characterized by pure awareness … and a dissipation of any sense of separateness between self and other' (p. 2). They asked participants trained in different contemplative traditions and practices (Vipassana, Transcendental Meditation, visualization, and others) to engage in meditation after being instructed as follows: 'If at any point during your meditation you become aware that you have transitioned from a state of non-thought (or transcendence, mental silence, or nonduality), back into a state of thought, please indicate this by winking your left eye, as long as you can do so without disruption of your meditation' (p. 5). Results showed that, irrespective of meditative technique, self-indicated states of nondual awareness correlated with a distinctive EEG signature. This interesting study, we suggest, could be productively complemented by a phenomenologically 'thicker' investigation of the temporal structure of participants' meditation practice, and by using participants' reports to interpret brain activity. For example, one could ask meditators whether they prepare for a state of nondual

awareness and, if so, how (e.g., do they actively seek to achieve it? Or do they let it 'come' by adopting a more passive, receptive attitude?). One could also explore the moment the meditators note that the state of nondual awareness has dissipated, and inquire into what happens at the physiological level when this noting occurs. Is it possible to identify a neural 'transition pattern' between nondual and dual awareness? If so, can experience be probed further to identify something in it corresponding to this neural transition—perhaps by using here techniques borrowed from the 'explicitation interview' mentioned in the previous section?[11] (See Jo *et al.,* 2014 for a recent application of an iterative method that used self-reports and neural measures to generate further hypotheses about the relationship between experience and brain activity).

4. *Meta-awareness*. Over time, meditating is said to change people's awareness not just of the world, but also of oneself and of one's awareness of self and world (i.e., meditation is said to enhance meta-awareness). These changes are likely to come with an increased awareness also of the *limits* of one's capacities to conceptualize and/or talk about one's experiences. A further possibility for a neurophenomenologically thicker approach to meditation, then, could involve conducting longitudinal studies to explore such changes in meta-awareness (if any), including changes in one's awareness of the difficulties and limitations of putting experience into words (if any). Here, qualitative and phenomenological investigations could be used to explore possible changes, over time, in participants' meta-awareness; data obtained in this way could then be used to interpret brain activity, aiming to understand whether possible changes in meta-awareness are underpinned by specific changes in brain activity. Data about brain activity could in turn be used as an additional source of information for both experimenters and participants, perhaps to indicate whether and how experiential reports could be further refined.

5. *Ability to report*. Neurophenomenological approaches to meditation often assume that expert meditators are able to provide more accurate and fine-grained accounts of their experiences than non-meditators or novices (e.g., Lutz *et al.*, 2007; Jo *et al.*, 2014). We think that this contention would benefit from a thick neurophenomenological investigation, as it makes a number of assumptions about expert meditators' linguistic-representational capacities. One way to test the assumption that accuracy increases with practice could involve measuring physiological activity in non-meditators, novices and expert meditators, and asking them to report their bodily sensations in real-time, to check whether expert meditators are indeed more accurate than other participants in describing bodily sensations.[12] As part of this investigation, one could ask whether there are traditions that encourage talking about the experience of meditation more than others,

and whether these differences affect meditators' ability to put their experiences into words, as well as their meta-awareness. Also, one could investigate whether any differences in the capacity to describe experience also come with differences in brain activity. This research might make it possible to classify meditators on the basis of not just how many hours of practice they have (currently the standard criteria in contemplative neuroscience), but also of their ability to talk about their experience, including their awareness of the difficulties and limitations of doing so.

These, then, are some possibilities for engaging contemplative neuroscience with existing discussions about experience and its verbalization. In offering novel possibilities for experimentation that take as their topic the contingencies and limits of accounts, our agendas aim to promote ways in which self-reports and bodily measures can be put in conversation with one another along the lines advocated in section 2.

6. Concluding Remarks

As a contribution to the current mix of both curiosity and caution that characterizes the scientific study of meditation, we have aimed to advance a set of possibilities for future research. We situated current experimental methodological challenges against tensions associated with recounting experiences that feature in writings on meditation in a variety of genres. The limits of verbalizing experiences of meditation have been prominently discussed in Buddhist doctrine, first-person accounts of meditative journeys, and social and cultural analyses of meditation and research experimentation. In highlighting some of the ways authors grapple with what is not put into words about experiences of meditation, we sought to show how these allied bodies of writing can be a creative resource for contemplative neuroscience.

To date, considerations regarding what can, should, and is not said about experience have not significantly informed contemplative neuroscience research—in large part because of the ways in which neuroscience in general disregards first-person accounts of experience. Yet, we have argued, recent developments of the neurophenomenological approach are paving the way for a contemplative neuroscience that *can* engage those tensions and questions, generating new possibilities for accommodating first-person perspectives in its wake.

Centred on ways of working *with* absence, the type of engagements we have started to signpost in this article could be mutually enriching. Contemplative neuroscience offers the potential to render longstanding debates and questions about spiritual doctrine and subjective experience

into empirical topics for investigation. Likewise, a contemplative neuroscience informed by the wide-ranging and extended discussion about what cannot be said about experience offers additional agendas for research. This holds the potential not just to open up new topics for experimentation, but also for the transformation of what forms of science are possible that Varela (1996) hoped for through the development of neurophenomenology.

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Notes

[1] As one anonymous referee rightly pointed out, these calls for integrating first- and third-person data face various challenges. A particularly difficult one is posed by the long-standing divide between quantitative and qualitative methods, which come with different and seemingly incompatible philosophical and epistemological assumptions. Notably, whereas neuroscientists often rely on some forms of naïve realism (e.g. in relation to the representational abilities of language), social scientists typically endorse a social constructivist framework. We think that, in spite of these undeniable differences and the need for caution when engaging in interdisciplinary research, it is possible to integrate different methods to study conscious experience in a productive way. We say more about this in section 4, where we illustrate neuroscientific studies that, in our view, successfully integrate qualitative and quantitative methods.

[2] Thanks to Jonathan Shear for this point.

[3] Also, see Sharf (2000) for a refutation of the premises underlying this type of specification.

[4] Thanks to John Whalen-Bridge for this point.

[5] This observation is not unique to Tibetan Buddhism in recent times. Buddhism has a long history of modifying teachings and practices to facilitate its spread and survival—spurring concomitant changes to the role and significance of meditation (Shedneck, 2015, chapter 6). Consider for example also the politico-religious significance of Burma's mass lay meditation movement that came to prominence in the mid-twentieth century (Jordt, 2007).

[6] Whereas this section continues to focus on Buddhist meditation in particular, of course not all meditation subjects are religiously affiliated. For an analysis of how the secular mindfulness movement enables new ways of bringing experience within the remit of scientific forms of thinking and analysis, see Walach (2014ab).

[7] Ricard's accounts can also be contrasted with those that discuss meditative experience through Buddhist terminology, as in Lopez Jr. (2008, chapter 5); see also the approach advocated by Schmidt (2014).

[8] On a related note, discussions of the dissemination and uptake of Buddhist-inspired meditation by Western practitioners often point to the erasure of religious (ritual and soteriological) and cultural meanings in the process (Andresen, 2000; Lopez Jr., 2008; Faure, 2012). Critics have argued that what the West has received is a narrow notion of meditation that is anthropologically and historically inaccurate: meditation in Asian Buddhist societies tends to be both less widespread and closer to devotional practices than its Western projection would have one believe (Lopez Jr., 2008; Faure, 2012).

[9] This experiment is similar to the one conducted by Lutz *et al.* (2002), who investigated participants' visual perception of 'magic eye pictures' (autostereograms). Here, too, the experimenters asked participants to describe their experience in their own words, and were accordingly able to identify categories of experience that enabled them to make sense of patterns of brain activity that would otherwise have appeared as mere noise.

[10] A similar tendency can be found in Thompson (2015), who examines several yogic accounts of consciousness, and maps them onto recent neuroscientific findings. Even when he discusses conscious states traditionally characterized as objectless and non-conceptual, he does not make reference to what is or may *not* be talked about these states, and it is not clear whether he thinks that there are experiential states that do not lend themselves easily (if at all) to neurophenomenological investigation because of their objectless and non-conceptual nature, and/or because of social conventions about disclosure.

[11] For example, one could use specific 'deepening techniques' involving 'Ericksonian language'—see Petitmentin (2006, p. 250).

[12] Interestingly, a study by Sze *et al.* (2010) found that reported visceral awareness in meditators did *not* correlate with actual cardiac activity. The authors attributed this result to the inadequacy of their self-report inventory for bodily awareness, which did not inquire about real-time bodily sensations but only asked participants about their bodily functioning more generally. A thick neurophenomenological study addressing this topic would ask participants to describe their bodily sensations as they occur (or immediately after), and compare these reports with measurements of related bodily activity.