LOGICAL ANALYSES OF VIPASSANĀ MEDITATION

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ABSTRACT

In this paper we propose logical analyses of *Vipassanā Meditation* as modus ponens or universal instantiation, as based upon identification, analysis, and interpretation of the meditation as a (spiritual) thought experiment (STE like e.g. *huàtóus* and *kōans* in Chan and Zen).*

The analyses consist in completing the unfinished enthymematic argument of the *Sutta-nipāta* by explication of hidden major. We speculate the thought experiment inference might be brought about by a faculty like mindfulness. The thought experiment analyses link the meditation to global cross-cultural theories and arguments in philosophy as Ibn Sīnā's *Flying Man* and, notably, René Descartes's *Cogito*. Last, we will give some indications how *Vipassanā Meditation* may be explained with help of western theories of consciousness.

Vipassanā Meditation and (S)TE*

To: *Mother* (Without Whom Not)

Although we are not a practising Buddhist, we assume Siddhartha Gautama's attainment of Enlightenment – as by development of mindfulness in *Vipassanā Meditation* – is among the greatest TE* of all times

> But I have not gone forth to seek sense pleasures.
>
> I have gone out to strive, seeing danger in them,
>
> And seeing safe refuge from them in renouncing.
>
> That is my heart's desire.
>
> ....
>
> .... I shall have more
>
> Of mindfulness, of understanding,
>
> I shall have greater concentration.
>
> For living thus I come to know
>
> The limits to which feeling goes.

My mind looks not to sense desires ...

(Ñāṇamoli 2001, 12-13, 20 – *Sutta-nipāta* 3.1–2)[1]

It can be considered an *Abstract Spiritual TE*. Just because it is quite abstract we can hardly say anything about its deeper contents and probably it is rather about a constitution of mind and body, and proper bodily and mental preparation than about mental exercises only. We will try and say something about its logical structure and compare it to more TE, notably a paradigmatic western TE, René Descartes's *Cogito*, thereby refraining from e.g. its moral senses and implications. Both Descartes's *I* and Siddhartha Gautama's *Enlightenment* can be considered *abstract* entities.[2]

The faculty involved, that may perform the TE, is not intuition (e.g. Descartes's *Cogito*), or alertness (Ibn Sīnā's *Flying Man*), but probably mindfulness, possibly accomplished by breathing techniques. We assume that the TE inference has a logical basis and it is part of logical apparatus as may appear evident after explication of the TE into a logically valid argument. Our interpretation remains within the logical realm, revealing the logical structure of the TE; it is not firstly about investigations into the nature of the faculty involved, but we will discuss some considerations in support of the mindfulness interpretation.

We assume a fourfold philosophical definition of TE. Ontologically speaking, TE are mental phenomena; hermeneutically speaking, TE are TE texts; logically speaking, TE are incomplete arguments or enthymemes; on pragmaticist definition TE are cognitive mental tests (i.e. tests that are executed in the mind) that are designed to resolve predefined problems (see Hertogh 2015a).

In case of the *Vipassanā Meditation*, it is obvious that it is about a mental phenomenon. The *Vipassanā Meditation* appears in a Buddhist religious text, the *Padhāna Sutta, Sutta-nipāta, The Great Struggle* or *Exertion*. For this reason, it is a religious thought experiment, quite often additionally characterised by a supernatural dimension. In section Logical analyses of Spiritual TE, we will show that *Vipassanā Meditation* is an enthymeme (according to *Webster's 11th*, 'a syllogism in which one of the premises is implicit'), that may be logically analysed as *modus ponens* instantiation. The *Vipassanā Meditation* may be considered a kind of cognitive instrument to reach Enlightenment, a Buddhist supernatural dimension. In section Interpretation of *Vipassanā Meditation*, we will try and explain the workings of the meditation in terms of western theories of consciousness.

Spiritual TE

Next to a religious TE, the *Vipassanā Meditation* may be considered a *Spiritual TE*, like, e.g., Chan and Zen meditations. Spiritual TE have spiritual and psychological functions of meditation and their predefined goal is

possibly contributing to ease of mind, reflection on theological issues and, finally, attainment of Enlightenment.[3]

Chan and Zen meditations are not abstract but *symbolic* because their practitioners meditate on *kōans* and *huàtóus* – possibly by same faculty of mindfulness, but directed to statements from recorded sayings, dialogues, 'religious biographies' of Chan and Zen masters (Heine and Wright 2010, v, Aitken 1991, Waddell 2010). We use symbolic in its semiotic sense as signifying a relation to signs, most often conventional signs of language as used in the Buddhist scriptures. *Huàtóu* (話頭) literally means 'word head', and *kōan* (公案, from Chinese *gōng'àn*) 'public case', i.e. beyond private opinion.

Though *kōans* and *huàtóus* may resemble western paradoxes and conundrums their goal is quite different, for western paradoxes are not used for any spiritual purpose, but are only specimens of reasoning and logic, sometimes paradoxically used to show the very limits of reason and logic. The western paradoxes may lack any predefined goal as resolution of a scientific, psychological or theological issue.

A famous modern *kōan* attributed to Hakuin Ekaku

You know the sound of two hands clapping;
tell me, what is the sound of one hand?

A traditional *huàtóu* attributed to Zhaozhou Congshen

Has a dog Buddha-nature or not?
Zhaozhou answered, Wú (无).[4]

These meditations may only point at an experience of Enlightenment. They are superseded by the *Vipassanā Meditation* because Enlightenment is not only considered to be pointed at in this meditation, but also psychologically and theologically effected. Different from sophistry and paradoxes, Spiritual TE are used as devices of problem-solving, they yield psychological and spiritual results that have been confirmed by medical investigations (e.g. Baer 2003), and quite different from sophistry they are non-commercial and aim at redemption from deception, etc., instead of adding to it.

The method of meditation may seem to come quite close to methodologies discussed in TE literature as 'reflective equilibrium', 'armchair inquiry' (Sorensen 1992) or 'guided contemplation of an imaginary scenario' (Gendler 1996), but, again, the philosophical TE lack a spiritual aim. Though aim and background may be different, we will propose a TE analysis of *Vipassanā Meditation* applying the same TE theory as used in analysis and interpretation of secular and scientific TE. The analysis and interpretation will appear particularly similar to Descartes's *Cogito* analysis.[5]

In the Buddhist tradition, the concepts of *I* and *God* are more often associated or even identified than in the philosophical west and they sometimes describe part of the possible mystical aspects of the *Vipassanā*

Meditation, unity with ultimate nature, God, etc. Our interpretation does not consider possible mystical aspects in particular, which may be additional and not necessary to the spiritual aim of the TE.

We won't discuss such (theological) concepts as *nirvana*, often quoted as the state of Enlightenment attained by the *Vipassanā Meditation*. However, apart from mystical aspects and different from Descartes's subjectivist *Cogito, Vipassanā Meditation* may have a predefined altruist sense, too – compassion or loving kindness (e.g. Gunaratana 2011; Kabat-Zinn 2000; paraphrased in Baer 2003).

Logical analyses of Spiritual TE

We will first make some preliminary logical remarks on *kōans* and *huàtóus* in section Logical remarks on kōans and huàtóus, before we will show TE and deep analyses of *Vipassanā Meditation* as (universal) modus ponens (instantiation) in section Logical analyses of *Vipassanā Meditation*.

Logical remarks on *kōans* and *huàtóus*

Both conundrums introduced in section Spiritual TE can be logically analysed and we guess the first one was a problem for the old school of classical logic (that considered e.g. bivalence as a basic indispensable logical law, principle or, mathematically speaking, axiom), but that constitute no problem anymore for new schools of logic who accept existence predicates and many-valued logic. The second conundrum hinges on the metaphysical concept of *wu* and it is therefore rather a metaphysical conundrum than an elementary logical problem. Most importantly, however – and this is one of the main differences with western paradoxes and sophisms – is that both these conundrums have not been designed as logical problems first, that is, problems about what there is in the outside, external world, but may be considered as Spiritual TE, that is, as models of consciousness, and in this latter sense we will try and explain them with help of recent western theories.

Above all, let's make it clear that they are not just physical, biological problems about clapping of hands and dogs. Clapping of one hand is not just physically impossible (though not really impossible, one hand can still make a clapping sound when one claps the fingers to the palm of the hand, but this gesture will make a different and lesser loud sound than two hands, so it could be considered not really clapping or not really the same as clapping with two hands), but the concept itself of clapping one's hands presupposes two hands (as usual attributes of humans and some animals, chimpanzees, for instance, who are also able to clap their hands), so clapping with one hand is usually considered conceptually and logically impossible.

For the old school of logical empiricists and contemporaries it means, e.g., that clapping one's hands is a property that can be formalized by a predicate letter with a variable and two hidden constants (e.g. xCa_1a_2: x is Clapping her/his hands a_1 and a_2), that becomes ungrammatical when there is only one hand, that is, when there is a constant missing to complete the predicate letter (e.g. xCa_1?). Considered as an ungrammatical statement, possibly a grammatical joke, its conscious effect may come close to what Ludwig Wittgenstein calls the depth of philosophy

> The problems arising through a misinterpretation of our forms of language have the character of *depth*. They are deep disquietudes; their roots are as deep in us as the forms of our language and their significance is as great as the importance of our language – Let us ask ourselves: why do we feel a grammatical joke to be *deep* … (And that is what the depth of philosophy is.) (Wittgenstein 1953, #111)[6]

Bertrand Russell could have analysed statements like Ekaku's minor as a problem of existential import, existence predicate, etc., as it is comparable to his example 'the King of France is bald' (Russell 1905, 483, 484, 479–' … A phrase may be denoting and yet not denote anything; e.g., 'the present King of France'), when there is, in fact, no King of France, at the moment, thereby denying existence could be considered just another property as for example 'is bald', 'has a wig', etc. (in classical logic 'p is/exists' is formalised as p, and 'p is not/does not exist' as -p). 'What is the sound of one hand clapping?' may be answered trivially by 'there is – i.e. there exists – no sound of one hand clapping' (even, 'it is logically impossible for the sound of one hand clapping to exist', but we would have to add, in this 'actual world', since we remain in the realm of classical logic). What we are asking for presupposes something that, in fact, does not exist, so we have to state something about a non-existent – is this possible or not? And, is such a statement T(rue) or F(alse)? These were the questions Russell and many more logicians in his days were struggling with.

Nowadays, however, quite a few logicians accept existence predicates, so this problem may be considered resolved (e.g. Saul Kripke's possible worlds semantics, e.g. Kripke 1963, 1980, e.g. 1963, 70 *E(x)*) – the sound of one hand clapping does not exist (in the 'actual world'). Also many- or three-valued logics – which are quite common these days, but still considered non-classical logics – could easily handle the problem by answering the question of the truth value of 'what is the sound of one hand clapping?' by 'the sound of one hand clapping is neither true, nor false' or, e.g. 'undetermined', 'irrelevant', 'possible' (e.g. ½ next to 0 for False and 1 for True – see e.g. Łukasiewicz 1920, 1970; Kleene 1938; Hempel 1945).

Different from western logic, Ekaku's conundrum may draw attention to the psychology or consciousness of (uttering or discovering) this paradox,

beyond the mere feeling of a joke (which may only hold for pragmatical S-H, Speaker-Hearer, situations where it is indeed intended as a joke) unto a spiritual (or conscious) experience, possibly experience of emerging consciousness or insight.

With regards to *kōans*, we guess Douglas Hofstadter's concept of a 'feedback loop' as a model of consciousness may apply conveniently to cover the logical, psychological and metaphysical – e.g. conscious – aspects of the TE. There are analogies to optical illusions, impossible objects etc. Wittgenstein discusses some of them in the last part of *Philosophical Investigations* as instances of the '"dawning" of an aspect' (Wittgenstein 1953, 194). Analogous to the clapping conundrum we could think of optical illusions, e.g. Jastrow's rabbit-duck/duck-rabbit, Necker cube (see Wittgenstein 1953, resp. 194, 193)[7] and Penrose figures (see e.g. Penrose 1989, 2004). Hofstadter (1979) discusses many analogies of *kōans*, e.g. in the visual arts the lithographs of graphic artist M.C. Escher, as 'visual realizations' of loose and tight feedback loops. Hofstadter considers 'feedback loops' the basic building blocks of human cognition and consciousness, preceding his book *I Am a Strange Loop* (2007)

> My belief is that the explanation of 'emergent' phenomena in our brains - for instance, ideas, hopes, images, analogies, and finally consciousness and free will - are based on a kind of Strange Loop, an interaction between levels in which the top level reaches back towards the bottom level and influences it, while at the same time being itself determined by the bottom level. (Hofstadter 1979, 709)[8]

In section Mindfulness and consciousness studies, we will return to Hofstadter's cross-cultural hypothesis.

Zhaozhou's *huàtóu* has a metaphysical aspect related to the concept of *wu*. The Chinese *wu* (無 or 无) is translated to *mu* in Japanese (無) and Korean (무), under which name it may be better known in the west. It is a metaphysical concept, signifying negative, not, without, nothing, emptiness, non-existent, unasking, impossible, without cause, awareness (Chan awareness – prior to experience or knowledge), non-being (*Dao De Jing* non-being – from which being is produced), etc. (please, see *Wikipedia* at 'Mu (negative)').

In its negative meaning of non-existent *wu* is similar to the minor of Ekaku's *kōan*, but if this could be considered a feature of *kōans* and *huàtóus*, generally speaking, goes beyond the limited scope of this research which focuses on logical analyses and interpretations of *Vipassanā Meditation*. *Huàtóus* and *kōans* could be considered enthymemes, too, like *Vipassanā Meditation*, and at this stage we won't add deep analyses of *kōans* and *huàtóus*, and focus on *Vipassanā Meditation* instead.

Logical analyses of *Vipassanā Meditation*

There are at least two important similarities between the *Cogito* and *Vipassanā Meditation*

a – Rhetorical use of the *I*, thereby generalising from, respectively, Descartes or the *I* personage of Descartes's text, and the creator of the *Sutta-nipāta* or the *I* personage of the *Sutta-nipāta*, traditionally considered Siddhartha Gautama – to all of humankind.

b – Both are TE par excellence because the very method and contents of the TE are (about) thinking, mind, etc. We might say that *Vipassanā Meditation* probably is the greatest TE of all time, even greater than Descartes's, because it chronologically and theoretically precedes Descartes's. Both *Vipassanā Meditation* and *Cogito* presuppose some sort of difference between mind and body and it is likely that Buddhism may have inspired later doctrines and theories on the same topic, even in the west.

The similarities accord with a feature of TE as explained by John Norton as an 'inductive step' from the particularity of TE premise(s) to generality of the conclusion

> Thought experiments are arguments which:
> (i) posit hypothetical or counterfactual states of affairs, and
> (ii) invoke particulars irrelevant to the generality of the conclusion.
> (Norton 1991, 129)

Enthymematic TE

Both the *Vipassanā Meditation* and the *Cogito* can be considered TE, and both can be considered an incomplete argument or enthymeme (from ancient Greek ἐνθύμημα, *enthumēma*). Enthymeme as mentioned in Aristotle's *Rhetorics* is a rhetorical syllogism, an inductive argument about probabilities, while a categorical syllogism, a deductive argument, is about truth. Both enthymemes and strict syllogisms are apprehended by the same faculty

> Hence, the man who makes a good guess at truth is likely to make a good guess at probabilities.
> (Aristotle 2010, I, 1 Arist. *Rhet.* I.1, 1355a, trans. W. Rhys Roberts)

In a strict sense, enthymeme refers to Aristotle's rhetorical syllogisms, but in a broad sense it refers to incomplete arguments and syllogisms, generally speaking.

Lakatos (1976) calls attention to the use of TE as informal proofs in Pre-Euclidean mathematics, enthymematic structures that can trigger more creativity than Aristotle's formal syllogisms

.... This is characteristic of ancient informal logic, that is, of the logic of proof or of thought-experiment or of construction; we regard it as enthymematic only through hindsight; it was only later that the increase of content became a sign, not of the power, but of the weakness, of the inference ....
(Lakatos 1976, 81n2 – italics in original)

Enthymeme is discussed by Roy Sorensen as a typical form of TE argument, in a chapter about 'The Logical Structure of Thought Experiments'

Arguments are typically presented as enthymemes. An enthymeme is an abbreviated formulation of the argument, that is, a formulation missing a premise or conclusion. Since the gain in brevity is constrained by the desire to be understood, there is a limit on how short an enthymeme can be. If we clip too much, the misshapen utterance becomes ambiguous or incomprehensible. … Logic helps us avoid this vice by giving us the ability to make arguments explicit. The premises of the regimented argument can be carefully inspected for plausibility and relevance. This naked state also provides the best basis for comparisons with other arguments: hidden parts become visible, and false parts disappear…
(Sorensen 1992, 133)

In the next section, we will show that *Vipassanā Meditation* can be analysed as *modus ponens* or *universal instantiation*, quite analogous to Descartes's *Cogito* applying the hypothesis that TE may be analysed with help of formal logic, completing the incomplete enthymematic arguments by hidden or tacit, contextual or theoretical premises, principles, axioms, presuppositions, etc. (see Hertogh 2015a).

Deep structure – modus ponens instantiation

The *Vipassanā Meditation* – reconsidered as an (incomplete) TE argument – may be analysed as follows

[1]

Suppose

> Mx x wants to attain Mindfulness, understanding, concentration
> Sx x seeks Sense impressions
> -   negation
> →   (material) implication, if … then …

then ⎯⎯   ⎯⎯
      | |
- Sa
Ma
⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯
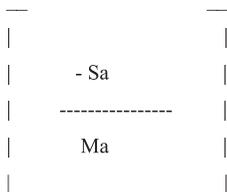
a signifies a logical constant – in application to *Vipassanā Meditation*, an individual, *I* of (creator, narrator, *I* personage of) the *Sutta-nipāta* (like *I* of the *Doubt TE* in Descartes 1637, e.g. 1901). On logical explication of e.g. Mx ≠ Sx - implying Mx →/ Sx, Mx → - Sx, Sx →/ Mx, Sx → - Mx, - Sx → Mx – as major of the argument, the (inference of the) TE argument becomes logically valid as modus ponens (p → q, p *therefore* q) instantiation (e.g. x is instantiated by a in next formula)

[2]

– Sx → Mx
– Sa
– – – – – – –
Ma

As according to TE theory, the first formula, [1], has been bracketed because it is not a logically valid argument yet, but the second formula, [2], can do without brackets as it is a logically valid formula as *modus ponens* and *universal instantiation*, which logical figures amount to e.g. Carnap (1966) model of scientific explanation and prediction.[9]

The major – Sx → Mx cannot only be understood as an inequality, of Sx and Mx, Sx ≠ Mx (or Mx ≠ Sx), but also as an opposition for which logic has no unequivocal sign. Lexicology (in some dictionaries) uses the same mathematical operator for an antonymous relation (≠); of course, antonymy, like synonymy, is a metaphysical relation and that is one of the reasons why there may not be a simple sign for it in logic.[10]

The opposition is clear from the passage

I have gone out to strive, *seeing danger* in them,

And seeing *safe refuge from them in renouncing*.

That is my heart's desire.
(italics added)

as well as a repetition of the inequality in the end

My mind looks not to sense desires …

which statement is like a repetition of the very first line of the passage

But I have not gone forth to seek sense pleasures.

but not anymore as kind of empirical premise now, but as conclusion after explanation of the argument in between, which is based on opposition between mind and sense. The inequality is like a (conceptual) opposition

for only by 'renouncing' of 'sense pleasures' can one find 'safe refuge from them'.

Summarising, the core argument of *Vipassanā Meditation* draws a contrast between 'sense pleasures' or 'sense desires' on the one hand and 'mindfulness', 'understanding' and 'concentration' on the other hand. Remarkable is the line

> For *living* thus I come to know
>
> The limits to which feeling goes.
>
> (italics added)

We may infer two things from it –

First, different from western philosophy it is not only about a way of thinking but a way of living, involving both mind and body, though one would expect a strong emphasis on mind.

Second, one of the (sub)goals of the enterprise appears to 'know the limits to which feeling goes.'

We will not digress on these propositions here, since it may go beyond the main purpose of this paper, i.e. to demonstrate that *Vipassanā Meditation* can be analysed as a logical argument by application of TE theory (see Hertogh 2015a).

Interpretation of *Vipassanā Meditation*

In the last part of the paper, we will try and discuss the nature of the TE inference in *Vipassanā Meditation* e.g. which faculty may perform it.[11] In section Mindfulness (*sati*), we will argue in favour of the consideration that faculty concerned is mindfulness. In section Mindfulness and consciousness studies, we may touch upon similarities between concepts of mindfulness and western notions of consciousness. Finally, in section What TE theory adds, we summarise what TE theory may add to analyses and interpretations of *Vipassanā Meditation*.

Mindfulness (*sati*)

Like intuition is considered the (psychological) faculty involved in Descartes's *Cogito* and alertness (تنبه *tanbih*) in Ibn Sīnā's *Flying Man*, mindfulness is quite often mentioned as the relevant faculty when performing Gautama's *Vipassanā Meditation*.

Vipassanā means insight in Pali, the Pali word for mindfulness is *sati*. Nevertheless, these names, insight and mindfulness meditation, are often used interchangeably, e.g. according to Bhante Henepola Gunaratana

> Mindfulness is the center of Vipassanā meditation and the key to the whole process. It is both the goal of this meditation and the means to that end. You reach mindfulness by being ever more mindful….
> (Gunaratana 2011, 139)

Like with paradoxes we find irrational, non- or alogical interpretations of mindfulness, e.g. as 'presymbolic … not shackled to logic', 'above and beyond words', etc.

> Mindfulness is the English translation of the Pali word *sati*. *Sati* is an activity. What exactly is that? There can be no precise answer, at least not in words. Words are devised by the symbolic levels of the mind, and they describe those realities with which symbolic thinking deals. Mindfulness is presymbolic. It is not shackled to logic. Nevertheless, mindfulness can be experience – rather easily – and it can be described, as long as you keep in mind that the words are only fingers pointing at the moon. They are not the moon itself. …
> Mindfulness is a subtle process that you are using at this very moment. The fact that this process lies above and beyond words does not make it unreal – quite the reverse. Mindfulness is the reality that gives rise to words – the words that follow are simply pale shadows of reality.…
> (Gunaratana 2011, 131)

The difference with the western paradoxes remains the spiritual aim of the *Vipassanā Meditation* since *Vipassanā Meditation* is rather similar to prayers and contemplation than to philosophical conundrums, sophisms, etc.

In Descartes's *Cogito*, Ibn Sīnā's *Flying Man* and Gautama's *Vipassanā Meditation*, the TE points to something beyond the words of the TE, something abstract beyond the concrete act of the TE, in fact, it points to the (possible) existence of the mind (as distinct from the body) which can't be materialised, although words as *I* are considered indications of the abstract entity involved. For this reason the TE may be categorised as *Abstract TE*.

Interpretations of mindfulness as 'seeing' 'things as they really are' and 'seeing' 'the true nature of all phenomena' seem rather metaphysical and their discussion goes beyond the scope of this paper. But the first 'fundamental activity' characteristic of mindfulness (or *sati*) as described by Gunaratana 'remind[ing] us of what we are supposed to be doing' or 'attend[ing] constantly to what is really going on in the mind' (Gunaratana 2011, 140), comes close to the contents and conclusion of Descartes's TE, since Descartes couldn't conclude but that he couldn't deny or doubt the fact he was actually thinking and doubting at the very moment. Also Descartes's TE looks like a meticulous, scrupulous – in fact, methodological – investigation of the power and activity of thinking, the mind.

Of course – as e.g. Gunaratana remarks (Gunaratana 2011, 134, 136) – mindfulness is different from thinking but one may wonder if the latter may

describe Descartes's notion of 'cogitare' adequately as, e.g. the thinking of Descartes's TE may be related to (feelings of) doubting as well.

We would explain 'cogitare' ('res cogitans' as opposed to 'res extensa' in Descartes's terminology) as an umbrella term covering not just discursive thinking, but many more cognitive processes that go on in the mind as remembering; not just cognition, but many more processes that can't be sharply distinguished from emotion, as dreaming; not just symbolic processes but also iconic processes as imaging, imagining, picturing, etc.

Western philosophers can use the exercises of eastern philosophy to their advantage, as according to e.g. Gunaratana

> Meditation sharpens your concentration and your thinking power.
> (Gunaratana 2011, 10)

Mindfulness and consciousness studies

In this section, we survey a couple of theories in western philosophy of mind and consciousness studies. Cognitive scientists as Daniel Dennett are mentioned in discussions of mindfulness. We will highlight Douglas Hofstadter's global cross-cultural proposal, the concept of metacognition, continental phenomenology, etc. In the end of the section, we outline an example of western research confirming medical merits of Buddhist exercises of mindfulness. For full comprehension, we may advise the reader to consult the references.

In western consciousness studies the cognitive theory of consciousness has been popularised by e.g. Daniel Dennett (1991). Dennett's notion of 'Cartesian theater' is mentioned in Sharf (2014)

> Superficially, this notion of bare attention [one more interpretation of *sati* discussed by Sharf] would seem predicated on an epistemological model that Daniel Dennett calls the 'Cartesian theater' and Richard Rorty dubs the 'mirror of nature' …
> (Sharf 2014, 944)

Robert Sharf (2014) discusses analogies between western philosophy as about deconstruction of the 'metaphysics of presence' and conceptions of Chan as 'mindlessness' e.g.

> … Richard Rorty, in his *Philosophy and the Mirror of Nature* (1979), invokes the mirror metaphor in an extended critique of representational models of mind and associated correspondence theories of truth. Rorty's attack on foundationalism – his rejection of epistemological theories that appraise the truth-value of propositions according to their supposed fidelity to the external world – is reminiscent of Huineng's famous 'Bodhi has no tree; The bright mirror has no stand.' The subitists [Chan teachers of the

Southern School] reject any articulation of the path and any form of practice that takes the terms 'mind' and 'mindfulness' as referencing discrete and determinable states or objects or meditative experiences....
(Sharf 2014, 951)

We have shown how we can retain logic and rationality in analysing TE as René Descartes's *Cogito* and Siddhartha Gautama's *Vipassanā Meditation* and contrarily to the sceptics in Gautama's and Descartes's days – as well as contemporary scepticism – we have shown how logic can be used to complete these TE as logically valid arguments without recourse to vague and undefined concepts of 'meditative experience' – apart from mindfulness and consciousness that are working in many more processes than only meditation – and that these logical analyses make possible global cross-cultural hypotheses of analogies like Hofstadter's, which assumes that 'Zen ideas' like *kōans* 'bear a metaphorical resemblance' (Hofstadter 1979, vi) to ideas in western mathematics and logic, extending his *Gödel, Escher, Bach* hypotheses to eastern philosophy.

Rorty has to give up the metaphysics of presence because (e.g.) he wants to hold on to materialism in the field of philosophy of mind. Contrarily, we assume mindlessness may be considered one more kind of mindfulness. Rorty's 'ironism' may enclose him into the confines of his tradition ('... continuing the conversation of the West ...' Rorty 1979, 394) without any (mirrors to) understanding and appreciation of non-western cultures and philosophy.

Although we refrain from moral and ontological interpretations in this paper (which interpretations may be considered metaphysical, going far beyond an outline of the logical structure), we consider Hofstadter's (1979) proposal of consciousness defined as 'feedback loops' or analogies of cognition that may, in fact, constitute the *I - kōans*, amongst others, may reveal and suspend the circular or feedback structure of cognition and consciousness.

In a 2005 *Wired* interview Hofstadter refers to his 1979 *Gödel, Escher, Bach* as a theory of consciousness

What *Gödel, Escher, Bach* was really about – and I thought I said it over and over again – was the word I. Consciousness. It was about how thinking emerges from well-hidden mechanisms, way down, that we hardly understand. How not just thinking, but our sense of self and our awareness of consciousness, sets us apart from other complicated things. How understanding self-reference could help explain consciousness so that someday we might recognize it inside very complicated structures such as computing machinery. I was trying to understand what makes for a self, and what makes for a soul. What makes consciousness come out of mere electrons coursing through wires.
(Kelly 1995)

Theories of consciousness may come close to descriptions of mindfulness e.g. Scott Bishop et al.'s definition of mindfulness as metacognition

> In summary, we propose that mindfulness can be defined, in part, as the self-regulation of attention, which involves sustained attention, attention switching, and the inhibition of elaborative processing. In this context, mindfulness can be considered a metacognitive skill (cognition about one's cognition …). Metacognition is thought to consist of two related processes – monitoring and control …. The notion of mindfulness as a metacognitive process is implicit in the operational definition that we are proposing since its evocation would require both control of cognitive processes (i.e. attention self-regulation) and monitoring the stream of consciousness ….
> (Bishop et al. 2004, 233)

We guess in theories of intentionality, phenomenology, we may find some clues for a better understanding of mindfulness, beyond mere scientific psychology.

Ruth Baer defines 'mindfulness' with help of the concept of intentionality

> Mindfulness involves intentionally bringing one's attention to the internal and external experiences occurring in the present moment, and is often taught through a variety of meditation exercises.
> (Baer 2003, 125)

Phenomenology was introduced into philosophy by Edmund Husserl, which new discipline was based on analyses of intentionality. It is concerned with (objects of) awareness, consciousness. It has many followers, from Jean-Paul Sartre to nowadays aforementioned Daniel Dennett.

Sartre described the enterprise of phenomenology of the image as kind of introspection, reflection

> So we shall ignore theories. We want to know nothing about the image but what reflection can teach us. Later on we shall attempt, as do other psychologists, to classify the consciousness of the image among the other types of consciousness, to find a 'family' for it, and we shall form hypotheses concerning its inherent nature. For the present we only wish to attempt a 'phenomenology' of the image. The method is simple: we shall produce images, reflect upon them; that is, attempt to determine and to classify their distinctive characteristics.
> (Sartre 1940, 1966, 4)

Dennett's heterophenomenology is third-person phenomenology that is about to check subjective self-reports with scientific, empirical data.

Like performing TE, exercises of *Vipassanā Meditation* may breach methodological constraints of science and scientific experiments, viz., objectivity, controllability and repeatability. Scientific research and experiments are – and should be – 'objective', that is, e.g. controllable (by third parties, control groups, parallel studies, etc.) and repeatable.

TE can't live up to these constraints, and introspection is not a scientific, controllable, repeatable methodology. The same may hold for the subjective enterprise of meditation and exercises of mindfulness; these are not perceivable by others in any 'objective' way. In as far as brain activity can be displayed by monitoring and measurement, it does not disclose the very personal character of subjective experience, that which Thomas Nagel calls *What it is like to be X for X* (Nagel 1974) and Sartre's *être pour-soi* (vs. *être en-soi, being-for-itself vs. being-in-itself see Sartre* 1943, e.g. 2001).

Logically, TE from consciousness may trigger modal analyses involving conceivability arguments (e.g. Kirk 2015, 1974a, 1974b) and anti-materialist modal argument (e.g. Chalmers 1996, 2010).

Finally, we will address the possible beneficial medical effects of practice of meditation or workings of mindfulness on human health.

In Baer (2003) research and findings are listed that 'suggest that mindfulness-based interventions may be helpful in the treatment of several disorders.' E.g. Mindfulness-Based Stress Reduction (MBSR – developed by Kabat-Zinn 1990) may relieve 'chronic pain' and it may reduce 'high stress levels' (from cancer patients to community volunteers); Mindfulness-Based Cognitive Therapy (MBCT) may contribute to relieve of depression ('preventing relapse of major depressive episodes'); Dialectical Behavior Therapy (DBT) can treat 'borderline personality disorder'. The paper concludes e.g.

> In spite of significant methodological flaws, the current literature suggests that mindfulness-based interventions may help to alleviate a variety of mental health problems and improve psychological functioning.
> (Baer 2003, 139)

and

> As described by Kabat-Zinn (2000), the practice of mindfulness meditation is concerned with the cultivation of awareness, insight, wisdom, and compassion, concepts that may be appreciated and valued by many people yet difficult to evaluate empirically.
> (Baer 2003, 140)

What TE theory adds

We may draw, say, six conclusions from the logical analyses of *Vipassanā Meditation*.

First, in our interpretation the *Vipassanā Meditation* can be understood as an enthymematic argument presupposing a doctrine about relation between mind and body, possibly connected by 'feeling'. When we explicate

this principle the *Vipassanā Meditation* changes from an incomplete TE argument into a sound logical argument.

Our analyses are consistent with the view that *Vipassanā Meditation* is about attaining mindfulness (*sati*), in the phrasing of the *Sutta-nipāta* this is – or this is attained by – mindfulness itself, understanding, concentration.

Second, TE analyses add clear similarities and analogies to many more arguments in the history of philosophy, notably René Descartes's *Cogito*, which has a similar enthymematic structure and which may be completed in the same way as the *Vipassanā Meditation*, exemplifying the logical figure of *modus ponens* (*instantiation*). Both the concept of enthymeme and modus ponens go back on Aristotle; 'enthymeme' has recently been revived and updated in TE literature (as Lakatos 1976, Sorensen 1992), and '(universal) modus ponens (instantiation)' by epistemologists and philosophers of science as Rudolf Carnap and Karl Popper.

Third, the TE analyses add logical structure to the argument which may give at least this passage of the *Suttas* an argumentative structure rather than just features of narrativity and (auto)biography, with which it is traditionally endowed. For example, the repeat of the first line in the last line as sort of conclusion indicates that the creator of the *Padhāna Sutta* may have intended to explicate some sort of argument, instead of only narration of 'meditative experience'.[12]

Fourth, as logic – especially mathematical logic, like mathematics itself – may be considered a (near-)universal instrument that has been successfully applied in many communities and cultures around the globe, the argument of the *Vipassanā Meditation* wins not only on global cross-cultural analogues and similarities, but also (near-)universal validity and soundness. Different from western paradoxes and conundrums the argument is not meant to destruct any confidence in reason or rationality, but, contrarily, it is intended to implement exercises of mindfulness and meditation, that successfully hook on many branches of knowledge and life – logic, cognitive science, phenomenology, philosophy of mind and religion, and all ways and walks of life (as e.g. result of a particular practice of living).

Fifth, analyses of *Vipassanā Meditation* may go far beyond methodological boundaries of modern science, scientific branches of psychology, like behaviourism, social psychology, etc. That's why it may be fruitful to apply phenomenology and consciousness studies (e.g. Sartre, Nagel, Dennett, Kirk, Chalmers) and both classical and non-classical logics (many-valued logic, modal logic e.g. Kripke's PWS) to interpret consciousness TE, that Spiritual TE like *Vipassanā Meditation, kōans* and *huàtóus* may resemble to some extent.

Sixth, the successful application of logic and mathematics to TE as diverse as Descartes's *Cogito*, Ibn Sīnā's *Flying Man* and Gautama's *Vipassanā Meditation* provides for sufficient logico-scientific justification to render cross-cultural hypotheses (as Hofstadter 1979) less far-fetched than they may seem. Since the similarities between the TE are only structural, they don't necessarily determine the contents of key concepts of TE inference as 'intuition' (Descartes), 'alertness' (Ibn Sīnā) and 'mindfulness' (*Vipassanā Meditation*), but the analogies may nevertheless contribute to a deeper comprehension of the terms that are that many centuries and miles apart.

Notes

*TE : thought experiment(s)

STE : spiritual thought experiment(s)

1. *Vipassanā* (Pali) or *Vipaśyanā* (Sanskrit विपश्यन) or *Insight* (current English translation) *Meditation*.

   Our interpretation relates its contents to the relation between mind and body, and its methodology to thought experiments, see e.g. Descartes's *Cogito* in western philosophical tradition, after our (primarily secular) TE theory as developed in e.g. 'Semantics of Thought Experiments' (Hertogh 2015a).

   The 'breathing' interpretation may connect the South Asian meditation to Chinese meditations, that focus on *qi* (traditional Chinese 氣, simplified Chinese 气), e.g. Qi Cong meditation.

   The quote is derived from Ñāṇamoli (2001, 12-13, 20) who does not mention the original text but reference to the *Sutta-nipāta*, Sn. 3.1, 3.2, *The Struggle for Enlightenment*.

   A (USA standard ALA-LC) Latin transliteration of the original Pali verses of the quote (I shall … sense desires) can be found on *Access to Insight* web site, e.g., the second part of the quote

   … bhayyo cittaṃ pasīdati,
   Bhiyyo sati ca paññā ca samādhi mama tiṭṭhati.
   …
   … Tassa mevaṃ viharato pattassuttamavedanaṃ,
   Kāme nāpekkhate cittaṃ …
   (Bullitt 2013 'Sn_utf8' cf. Andersen and Smith 1913, 75
    https://www.accesstoinsight.org/tipitaka/sltp/Sn_utf8.html)

   As Bhikkhu Ñāṇamoli explains in his introduction, since the turn of the 19th century there are no doubts anymore among scholars about Buddha Gautama's historical existence, and the *Vipassanā Meditation*, by which Siddhartha Gautama is considered to have reached Enlightenment, is estimated to have taken place in 528 BCE (according to European scholars, the Sinhalese reckoning places it in 467 BCE).

   Sutta-nipāta is part of the Pali canon of Theravada Buddhism and consists of five chapters. First lines of the quote are derived from the last verses of the first section of Chapter 3 (*Mahā Vegga*), *Pabbajjā Sutta*. The second passage is

from the middle of the second section of Ch. 3, *Padhāna Sutta*, *The Great Struggle* (Ireland), *Striving* (Bodhi, Khantipalo, Norman), *Exertion* (Ṭhānissaro), just after Gautama's meeting with Māra. Most of the time we stick to Ñaṇamoli's translation, although we here and there hint at connotations of some more translations related to mindfulness (*sati*) next to Ñaṇamoli's understanding and concentration, e.g., Ṭhānissaro's discernment, Bodhi's, Ireland's, Khantipalo's and Norman's wisdom, but the latter may express metaphysical (possibly including mystical) aspects of *Vipassanā Meditation*, like 'seeing' 'things as they really are,' where we abstract from in this paper.

2. *Vipassanā Meditation* and *Cogito* or *Doubt* TE have obvious similarities. The *Cogito* may be considered an *Abstract TE* – revealing the *I* – but in the 2015 dissertation we firstly discuss it as an *Indexical TE* from philosophy of mind, and show that it can be comprehended without appeal to any spiritual dimension. All humanities TE are indexical because their contents are related to the thought experimenter, 'by virtue of real connections' (Peirce 1911 in PEP 1998). The same may hold for *Vipassanā Meditation*.

3. 'Spiritual' as adjective is derived from noun of 'spirit'. According to *Webster's 11th* the word dates from the 13th century, it is Middle English, derived from 'Anglo-French or Latin; Anglo-French, *espirit, spirit,* from Latin *spiritus,* literally, breath, from *spirare* to blow, breathe'. In Christianity there is a theological trichotomy as mind-soul-spirit; according to one of its many interpretations, the first is secular and mortal, the second is transcendent and immortal, and the third is kind of transcendent relation to the divine, the Christian God e.g. doctrine that man is a mirror of God.

4. Hakuin Ekaku (白隠慧鶴 1686 – 1769 Edo period) is one of the most famous Japanese Zen Buddhists. Translation *kōan* Norman Waddell (2010). Zhaozhou Congshen (趙州從諗 c. 778 – c. 897) is considered the greatest Chan master of the Tang dynasty. Translation *huàtóu* Robert Aitken (1991). An example of a sophistic paradox is Achilles and the Tortoise by the Pre-Socratic philosopher Zeno of Elea, belying Achilles could ever catch up with a tortoise in a footrace.

5. Descartes's *Cogito* is discussed in Chapter 6 of Hertogh (2015a), and publication for *Trans/Form/Ação*, Hertogh (2016). Its logical structure is modus ponens instantiation. On logical analysis the core line (*je pense, donc je suis, cogito ergo sum*) appears as minor of the argument as it is an individual rather than a general statement

　　　I think, therefore I am

The hidden major can be phrased as follows

　　whatever has the property of thinking, exists

Applying mathematical logic, the structure of the argument is displayed with help of existential quantification (instead of exemplification of an individual constant): *Suppose*

Tx　　x Thinks
Ex　　x Exists/is
$\wedge x$　　universal quantifier
$\vee x$　　existential quantifier
$\rightarrow$　　(material) implication, if … then …

$(\wedge x\ Tx \rightarrow\ \ Ex)$	whatever thinks, exists
$\vee x\ Tx$	there is an x (e.g. I, Descartes), that thinks
– – – – –	TE, intuition
$\vee x\ Ex$	there is an x (e.g. I, Descartes), that exists

  Like *Vipassanā Meditation* the *Cogito* is considered an enthymeme; explication of the major finishes the incomplete argument and renders it into a logically valid argument. The logical analysis of Ibn Sīnā's *Flying* (or *Floating* or *Suspended*) *Man* is more complex possibly involving modal logic, but it is also about difference between body and mind, to which one is alerted (rather than inferred) in the Persian TE (see Hertogh 2015b).

6. Particularly on a first secularist interpretation, some *huàtóus* and *kōans* may sound like a joke. If one wants to be pessimistic about human nature, one could think that this *kōan* wants to make fun of disabled persons who are missing one hand or arm, of *dis*ability generally speaking, as it seems to be about a *bodily im*possibility to clap only one hand. However, the cruelty disappears when one may consider it a political correct example of emancipation and equal opportunity of disabled persons. Furthermore, it is well possible that clapping of one hand may have had a special, e.g. ritual, significance in Japan's Edo Period, like dogs may have had a special Buddhist status in China's Tang Dynasty, interpretations that go beyond these logical analyses.

7. A Necker cube is a drawing of a cube which may be visually perceived in two different, mutually exclusive ways viz. either with left-down corner in front or left-down corner to the back; it is impossible for human perception to see both at the same time, one has to focus on either one or the other. It is discussed by Wittgenstein as '"dawning" of an aspect', an example of constructivist psychology. The cube is called after mathematician Louis Necker. One more example is a drawing that may be perceived as either a rabbit's or a duck's head (duck's bill are rabbit's ears, but, again, we can't perceive them as such both at the same time), called a duck-rabbit (or rabbit-duck), as after psychologist Joseph Jastrow. (This example may have the disadvantage that vegetarians would not be happy with it since it may remind of use of animals for human food.) Again, the illusions and impossibilities are confined to the 'actual world' of classical logic and physics ('It is clear that the "3-dimensional object" which the drawing [of a Penrose triangle] apparently depicts cannot exist in ordinary Euclidean space' – Penrose 2004, 992), but may be analyzed with help of (e.g. Kripkean) possible worlds semantics. Perceptually, an optical illusion can be understood as a confusion of multiple points of view, coexistence of the alternates at the same time is perceptually impossible. Impossibility may be breached by leaving, e.g., synchroneity presupposition (see Hertogh 1997), e.g., by adding time as supplementary set of coordinates, kind of fourth dimension, etc.

8. 'Strange Loop' may sound a little xenophobic. We guess Hoftstadter wants to say a feedback loop involving an inextricable confusion of levels like Wittgenstein points at a grammatical joke which may confuse grammatical categories.

9. As Rudolf Carnap, Karl Popper and more epistemologists and philosophers of science have shown, the traditional Aristotelian syllogism structures can be used to indicate (in)validity and (un)soundness of scientific arguments. Both *Cogito* and *Vipassanā Meditation* resemble Carnap (1966) generic scheme of

scientific explanation or prediction, which fits in with universal modus ponens instantiation

1. *(x)(Px → Qx)*
2. *Pa*
3. *Qa*

(Carnap 1966, 7, 17 – *(x)(Px→Qx)*: scientific law; *Pa*: description of the initial conditions; *Qa*: description of the event we want to explain).

We would like to add two postmodern conditions to 20th-century philosophy of science - global cross-culturalism and environmental pragmaticism (see Hertogh 2015a). With regard to the former, see e.g. Douglas Hofstadter's cross-cultural hypothesis in this paper. With regard to the latter, it wants to eliminate possible risks of damage to human health and natural environments from (societal applications of) science. Indian religions, like Buddhism, Hinduism and Jainism, obviously have ecological principles like vegetarianism, which is advocated for environmental reasons nowadays by, e.g., United Nations. We can summarize these maxims in an addition to Karl Popper's formula on growth of knowledge, progress of science ('…fundamental evolutionary sequence of events… $P_1 \rightarrow TS \rightarrow EE \rightarrow P_2$' - Popper 1979, 243), modifying it into *progress of science and society*

$$P_1 \rightarrow TS \rightarrow EE/EP\ GC \rightarrow P_2$$

where *P* stands for Problem, *TS* for Tentative Solutions, *EE* for Error Elimination; *EP* for Environmental Pragmaticism and *GC* for Global Cross-culturalism. The forward slash at EE wants to allow for 21st-century global cross-cultural and environmental criticisms (as to save Planet Earth - see e.g. Harari 2016, 20 '…. When the moment comes to choose between economic growth and ecological stability, politicians, CEOs and voters almost always prefer growth. In the twenty–first century, we shall have to do better if we are to avoid catastrophe.'; however, in our view, green policies and economical growth don't necessarily exclude, but possibly enhance each other, and we need to change to green technologies etc. as soon as possible, e.g. by development of renewable energy instead of fossil fuels).

10. Please, see e.g. Quine (1951) criticism of synonymy or sameness of meaning.
11. Also in natural science definitions as Ronald Laymon's, the nature of the TE inference or operator 'is never very explicit'

    $$\bigvee xTx \wedge P_1 \wedge P_2 \wedge \ldots P_n \rightarrow Q$$
    where VxTx is a highly idealised experimental description, $P_1, P_2 \ldots P_n$ are laws or principles believed true, and Q is to be demonstrated. … Our use of this operator [→] is meant to capture the fact that in scientific contexts the argumentation associated with thought experiments is never very explicit. (Laymon 1991, 167 – bracketed explanation added, logical notation adapted to this paper's, ∧ conjunction)

12. Robert Sharf questions if '(meditative) experience' is most essential to Buddhism (please, see Sharf 1995), and one may consider it part of the so-called 'Asian reform movements' of 19th–20th century that have been affected by the west (as

more authors may note), possibly as part of western colonialism

> By rendering the essence of Buddhism an 'experience,' the laity successfully wrested authority over the doctrine away from the clergy. The guarantee of orthodoxy was no longer rigorous adherence to the monastic code (*vinaya*), but rather a firsthand experience of the fruit of meditation – *nirvana*. Meditation instructors with little or no formal training in canonical exegesis were free to pontificate on the meaning of Buddhist scriptures, or, alternatively, to reject the need for scriptural learning altogether.
> (Sharf 1995, 258)

We restrict our interpretation to application of western logic and consciousness theories.

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