

# Vipassana for Hackers

# The Proposal

## Version 0.1

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(Dated: December 4, 2019)

Vipassana meditation (as taught by S.N. Goenka in the tradition of Sayagyi U Ba Khin) is unlike other meditation techniques insofar as its claims to completeness and outcomes are concerned. Vipassana claims to ultimately explore the entire field of mind and matter, with the goals of total liberation and full enlightenment. Implicit within these claims is a complete understanding of human consciousness. These are difficult claims to prove because the time commitment required to research the technique orders on multiple decades — if not multiple generations. This is complicated by the fact that the time commitment is demanded of both the researcher *and the subject*. Until now, research on meditation of all kinds has covered only one of two fields: (1) controlled experiments which must inherently rely on superficial data gathered from beginners and (2) observational exploratory research of monks — expert meditators who have dedicated their lives to the practice. I propose bridging this gap by submitting myself to the middle ground. While remaining a layperson, I will commit to a high ratio of waking meditation hours for the rest of my life. Individually and internally, I will conduct qualitative research into the consequences of Vipassana meditation and the nature of consciousness while collectively and externally pledging myself as a subject for long-term quantitative studies with a broader community of researchers.

Keywords: neuroscience, psychology, vipassana, meditation

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## I. INTRODUCTION

Research into the effects of meditation has been conducted in earnest for half a century but the quality of research in this field varies wildly. Randomized controlled trials were missing from much research conducted during the first few decades of meditation study. The importance of active controls was often missed even when randomized controlled trials were attempted. Double-blind studies are inherently impossible with meditation research; a subject will always know if she is receiving meditation instruction or an active control instruction. [10]

Add to these difficulties the very nature of meditation research itself. There are many techniques of meditation and it is very important to capture the specific technique under study to make meaningful assertions about its effects. [10] However, even within the definition of a single meditation technique there exist variations in instruction between teachers and each student's comprehension of the instructions received. [6] Even if researchers could cement (or at least accurately record) semantics and terminology, the subject of study is often unclear: Are we

looking for health benefits? Increases in productivity? Increases in intelligence? How long these effects persist? How much do we want to explore concrete hypotheses versus exploratory analysis of long-term effects? How much can be learned about the nature of consciousness? Can these learnings be measured objectively or even communicated meaningfully?

Because Vipassana<sup>1</sup> is globally standardized, it affords researchers with definitive solutions to the difficulties presented by varying teaching methodologies. In exchange for this, the difficulty of long-term study is compounded by the intrinsic seriousness demanded of a Vipassana practitioner: the Pāli concept of *ātāpī sampajāno satimā* (continuous piercing awareness of constantly changing bodily sensation [8]) is not only a requirement of serious Vipassana practice but could very well act as a surrogate description of the practice itself. This seriousness poses obvious difficulties and it is the intention of my study to begin breaking ground in solutions to those difficulties.

This study will prove significant in three fields of research:

First, and most accessible, is the continued quantitative research of meditation in the broader neuroscience

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<sup>1</sup>For the remainder of this research proposal, "Vipassana" will always refer to the specific technique "Vipassana as taught by S.N. Goenka in the tradition of Sayagyi U Ba Khin" and lineage-identical instruction, such as that taught by Ledi Sayadaw (in writing) or other students of U Ba Khin contemporary to S.N. Goenka, unless noted otherwise.

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and psychology disciplines, where my participation will be more as subject than researcher.

Second is the qualitative research into the long-term consequences of Vipassana meditation, what it reveals about the nature of human consciousness, and reusable techniques for its exploration — a field currently consisting of a bridge between psychology, philosophy, linguistics, and contemplative studies.

Third is the exploratory research intended to objectively define consciousness. As such research must pertain to all forms of consciousness it therefore includes all non-human forms of consciousness. Findings will inform our understanding of the Mind-Body Problem of psychology and philosophy, the entire field of bioethics, and — perhaps most importantly — the nascent field of Artificial Consciousness as a subfield of Artificial Intelligence. [12] As of this writing, this overarching integral field of study has yet to emerge and has no name as a discipline.

## II. PROBLEM STATEMENT

### A. Overview

### B. Hypothesis

## III. OBJECTIVES AND AIMS

### A. Overall Objective

### B. Specific Aims

## IV. BACKGROUND AND SIGNIFICANCE

### A. Preliminary Research Review

- summary of related research - strengths and weaknesses - justification — what hasn't been done by others? — why is this research necessary?

### B. Why Vipassana?

1. “complete”, standardized, global, multilingual, 100% free
2. mundane (sleep) vs. supramundane (total eradication of suffering)
3. who is steven deobald

### C. Why now?

## V. RESEARCH DESIGN AND METHODS

### A. Overview

As the structure of studies conducted on Vipassana is inherently very difficult, due to the strict nature of

Vipassana meditation instruction, we must first examine which kinds of studies are possible, which are not, and what will make possible studies worthwhile.

### 1. Expertise

A large scale controlled study of beginner-to-intermediate students of Vipassana, each practicing a minimum of two hours daily, is possible. Randomization will not be possible in such a study as the students self-select this meditation technique for themselves. The recommendation to practice the technique “a minimum of two hours daily” is a component of instruction, given to students even on the most basic 10-day introductory course. [2, 9] As such, it is possible to conduct such a study on students who have dedicated themselves to the practice of Vipassana in the manner recommended — and an increasingly large number of Vipassana meditators do so, worldwide.

However, such a study suffers from the very nature of the instruction and its target audience. On the lifelong scale of Vipassana practice, the spectrum spans from a minimum of laypeople practicing two hours per day to a maximum exemplified by renunciates (monks and nuns) who practice up to twenty-four hours per day once they reach the advanced stage where deep sleep no longer occurs. It is also worth noting that a junior renunciate will still have less *experience* than a senior lay meditator, which means that the only objective measure of experience is total number of hours meditated. [10]

Meditation research often has difficulty defining and capturing *expertise*, however, and total hours of experience is still confounded by the rate in which those hours of experience are accumulated (hours per day). We must capture both, as accurately as possible. Renunciates potentially have both a high hours-per-day rate and extended (lifelong) duration of experience. The existence of renunciates forces the very broad category of *expert* meditators into the territory of 100,000 hours of practice, even if we limit practice hours to formal, sitting meditation and estimate twelve (12) hours per day. If we take the much more modest rate of six (6) hours per day, assume an adult renunciate can learn Vipassana, at the earliest, from approximately 20 years of age, and is now of an age when they may participate in an extended study (say, 50-60 years of age), we arrive at roughly 60,000 hours of practice. If we use the oft-cited “10,000 hours” measurement for competence in a subject, we might reasonably describe our rough spectrum of expertise as such:

- Beginner: 0-10,000 hours
- Intermediate: 10,000-60,000 hours
- Expert: 60,000+ hours

As a consequence, even studies which claim to observe “expert” or “long-term” Vipassana meditators are often predominantly observing beginners (7.9-8.6 mean years of experience with 2 hours of daily practice). [4]

## 2. Methodological Issues

This is in addition to a large number of other methodological issues with studies of Vipassana, as described by Alberto Chiesa in *Vipassana meditation: systematic review of current evidence*, 2010. [4] These include the lack of: study replication, randomized trials, active plus inactive controls, and double/single blinding.

Chiesa also notes that it would be beneficial to capture data “both from a clinical and from a neuro-imaging point of view”, including functional magnetic resonance imaging (fMRI) and electroencephalography (EEG), for both short-term outcomes (altered states) and long-term outcomes (altered traits [5]) to improve future Vipassana research. [4] Optically-pumped magnetometer (OPM)-based magnetoencephalography (MEG) performed using a mobile helmet capable of operating at room temperature [3], in development since Chiesa’s paper was published, may permit it as a third neuro-imaging technique. Even older MEG technology based on superconducting quantum interference devices (SQUIDS) could potentially be used. The restriction of SQUID-based MEG is that subjects must remain extremely still, but this is all but a requirement of serious Vipassana meditation anyway.

Because Vipassana does not permit any form of imagination, any attempt to analyze it through philosophical phenomenology becomes a hindrance to actually practicing Vipassana. [13] The two are mutually exclusive, as is any attempt to contemplate Vipassana, the phenomenology of the mind, or the technique, during the actual practice of Vipassana. I have previously discussed this apparent paradox in Appendix A of *Vipassana for Hackers, Paper One: Curious Mechanics*. [7]

Last, statistical study of Vipassana, at the intermediate level, is currently not possible. Meditators who are in the process of transitioning from 10,000 hours of experience to 60,000 hours of experience are not readily available as research subjects in significant numbers. Because we have not studied such meditators, we are as of yet not exactly sure what we might be studying when we do study them. V.S. Ramachandran put this most succinctly:

“I can’t think of a single discovery of disease which had more than one initial sample. ... You can’t do statistical analysis of an initial discovery.” [14]

## 3. Meditation as Research Tool

A lifelong study of a single, increasingly-experienced Vipassana meditator is, in essence, an exploratory process of discovering what researchers might be bothered to study in a controlled trial with both active and inactive controls and (single) blinding, over a much larger sample.

This exploratory process has been described by Goleman and Davidson in *Altered Traits*:

“Perhaps one day an ultralong study will give us the equivalent of video on how altered traits emerge. For now, as the Brewer group conjectured, meditation seems to transform the resting state—the brain’s default mode—to resemble the meditative state.

Or, as we put it long ago, the after is the before for the next during.” [10]

The demands of such an “ultralong study” were echoed by Harari in *21 Lessons for the 21st Century*:

“Some universities and laboratories have indeed begun using meditation as a research tool rather than as a mere object for brain studies. Yet this process is still in its infancy, partly because it requires an extraordinary investment on the part of the researchers.” [11]

The line between “mere object for brain studies” and “research tool” begins to blur when we consider using meditation for both simultaneously. However, it seems remiss to neglect gathering whatever objecting EEG/fMRI/MEG data from the long-term subject-researcher when that data is so readily available.

## 4. Summary

Because Vipassana meditators are inherently self-selecting, double blinding is not possible, nor are randomized trials. Single blinding is possible, and should be employed in future studies where it is feasible. Combination active/inactive controls are also possible for all *statistical* studies on Vipassana.

The study proposed is an ultralong (lifelong) study of an individual — myself. As far as quantitative data gathered from brain scans is concerned, I am effectively making myself available as a human guinea pig. As far as qualitative data is concerned, research will take the form of a deep case study. As I will represent Ramachandran’s “initial sample”, statistical analysis will not be relevant. If the study proves productive, future studies targeting a specific hypothesis about Vipassana in a large sample can use learnings from this study in their statistical structure.

## B. Study Design

### 1. Qualitative

Qualitative research into the specific nature of human consciousness or the broader nature of consciousness as it applies to any organism or artificial intelligence can only

be performed directly. In this case, a case study performed by an individual (myself) will explore the question of consciousness and the mind-body problem directly, through Vipassana meditation, for a prolonged period of time (the remainder of my life). Many theories and questions currently exist regarding consciousness, such as *Theory of Mind*, *Theory of Panpsychism*, *Theory of the Entropic Brain*, the *Simulation Hypothesis*, etc. This study will not address any one of the many theories of consciousness directly, nor will it absorb any specific hypothesis. The data recovered from practicing Vipassana meditation directly for prolonged periods of time will almost certainly overlap with many such ideas but themes and narratives are likely to be emergent, rather than conforming to an existing hypothesis of consciousness.

Phenomenology, in the broadest sense, may be used to describe experiences as they pertain to a lifelong trajectory of altered traits. Phenomenological descriptions of deep meditative states, or even of altered traits, is not the goal, however. If other narrative tools emerge over the course of the study, I will augment phenomenological descriptions and imagery with those tools.

Vipassana's instruction provides us with claims we can evaluate: "[Vipassana] explores the entire field of mind and matter" [8], "[Vipassana] is a technique that will eradicate suffering" [1], and "Vipassana aims at ... total liberation and full enlightenment" [1]. Progress made in evaluation of these claims will be, by its very nature, emergent.

The validity of these emergent observations made during the qualitative portion of the study can be asserted across most axes of validity: prolonged engagement, rich descriptions, external audits (from more experienced meditators), identification of researcher bias, peer debriefing (again from more experienced meditators), and searching for discrepant evidence are all possible. Respondent validation (member checking), although possible, may not carry much weight in terms of strengthening the validity of the study, given an initial sample of one. Triangulation will not be possible with a sample of one. If the study proves productive, in the future additional researcher-subjects intent on a lifelong Vipassana practice may strengthen respondent validation and triangulation for parallel studies. Triangulation of qualitative analysis of consciousness suffers from the paradox that any individual's consciousness is only directly observable by that individual and conclusions — even those validated by triangulation — will always be in the third-person.

Data will be collected on a daily basis and themes and narratives regularly collected with the intention of describing mental phenomena and the evolution of traits as Vipassana practice progresses. Monthly or yearly schedules will be decided with a supervisor but an example daily schedule (subject to change before the study begins) is available in *Appendix 1: Proposed Daily Schedule*.

## 2. Quantitative

Measurements performed during the lifelong qualitative study

### C. POPULATION AND STUDY SAMPLE

### D. SAMPLE SIZE AND SELECTION OF SAMPLE

### E. SOURCES OF DATA

### F. COLLECTION OF DATA

### G. EXPOSURE ASSESSMENT

### H. DATA MANAGEMENT

### I. DATA ANALYSIS STRATEGIES

### J. Participants

- people and roles

### K. ETHICS AND HUMAN SUBJECTS ISSUES

### L. TIMEFRAMES

## VI. STRENGTHS AND WEAKNESSES OF THE STUDY

### VII. PUBLIC HEALTH SIGNIFICANCE

### VIII. BUDGET AND MOTIVATION

- resources required

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### X. REFERENCES

### XI. APPENDICES

#### A. Appendix 1: Proposed Daily Schedule

## ACKNOWLEDGEMENTS

Thank you to Preethi Govindarajan for reviews, edits, and corrections.

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