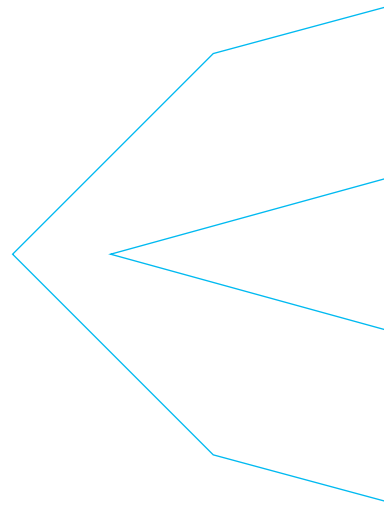


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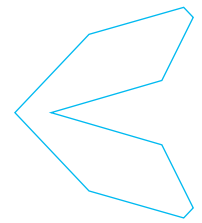
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EDITORIAL

Consciousness Science is Incomplete: It is Time for a New Paradigm



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Early in the twentieth century, psychotherapy began to turn from psychoanalysis towards a new idea: behaviorism (Viney, 1993), which emphasized observable and measurable behavior, not cognitions and emotions. John B. Watson was an early foundational figure in this movement. He stated that consciousness cannot be isolated in the laboratory for study, and, in fact, could not be studied at all. Further, Watson held that anything not subject to laboratory analysis was either not real or not important. This led to the behavioral assumption that the brain is a “black box” that played no role in behavior and could thus be ignored. Many found this to be repulsive and abhorrent for several reasons. However, behaviorism maintained its grip on psychology for decades before other methods could be developed. Plaudits went to those who could do relevant lab studies and get statistically significant results. Psychologists tried as much as possible to run lab studies in a scientific way but ignored a huge amount of data: subjective experience. Such experience, in natural and uncontrolled conditions (a.k.a. real life), is key to understanding consciousness, the human condition, and human nature. Science is clearly unprepared to address such data.

If we accept Watson’s reasoning, then there is little hope of understanding consciousness. Researchers have recognized this problem, and so consciousness science has for about 4 decades been focused on various forms of neuroscience—they have rejected Watson’s contention that consciousness and the brain can be ignored. This is a true step forward, but not nearly far enough. What has been left out (again) is subjective experience, which is the result of and the currency of consciousness. There is a strong case to be made that non-laboratory data, that is, experiential and subjective data—under certain constraints—qualify as valid scientific data. The status quo rejects such ideas, labeling subjective experience as “anecdotal.” Before this became a pejorative term, anecdotal simply meant unpublished. But in consciousness science, the term is a plain insult to those who maintain what I hold in this editorial. It has been said that “the plural of anecdote is not data.” In response to this, I hold that—when certain conditions are met—anecdotes *are* scientific data that can be very useful indeed. My goal here is to set out what I see as the necessary conditions and to give an example of how this methodology works.

To make my perspective clear, I argue that: (1) the incompleteness of consciousness science has delayed progress in humanity’s understanding of itself. In particular, consciousness has become a hot topic since the early 1990’s, but the understanding of consciousness remains elusive; (2) Subjective experience is the most direct and relevant method of studying and understanding consciousness; (3) The most fruitful data regarding consciousness are to be found in connection with death-related phenomena and anomalies thereof, e.g., near-death experiences (NDEs), after-death communications (ADCs),



reincarnation, and mediumship. *These four death-related anomalous experiences (DRAEs) have large data sets in the literature but are forbidden subjects for standard researchers.*

Clearly, these DRAEs are not acceptable scientific subjects, since little to none of these can be studied via the standard scientific method. One can search mainstream science forever without seeing a mention of DRAEs, due to the issues described above. Ethics and common sense tell us that we cannot kill a person in a lab setting, then bring them back and interview them in order to study, for example, NDEs. But the scope of science must be broadened to include such data, if we are ever to understand consciousness. Such broadening can be achieved by adjusting the scientific methodology used. I will illustrate this idea below. Here, however, I want to point out that I am not the only researcher to hold that a paradigm shift is vital. There are others in the NDE research community who entertain similar positions. Their work is very important, and I will illustrate the power of subjective experience in understanding consciousness.

Here, I describe a way of merging DRAEs and standard experimental science. I will cite *three principles* that render subjectivity a valid scientific source of data, using NDE data to illustrate my model. The model consists of three principles: (1) *intersubjective agreement*—independent experiencers of a subjective phenomenon consistently report certain aspects of the experience, the frequency of which can be measured; this allows, in the case of NDEs, a method of taking an experiencer's testimony and subjecting it to a rigorous pattern of investigation; (2) *Agreement with classical and/or new science*—if the DRAE can be described by using standard physics (e.g., electromagnetism and general relativity; Arnette, 1992, 1995) or new, speculative physics (e.g., string theory and multiverse theory), this provides a strong case to be made for the objective reality of the subjective experience; and (3) *veridical evidence*—perceptions by the experiencer that can be independently verified by independent records or the perceptions of others (Rivas et al., 2023). Such cases make a nearly impenetrable defense against skeptics.

As an example, consider NDE data. NDEs are full of detailed information, as given by the experiencer (NDER) during post-experience interviews. There are so many phenomena in NDEs that occur frequently enough that a scale can be created to administer to NDErs and determine (1) whether the person had an NDE and (2) the depth of the NDE if experienced. Bruce Greyson (1983) has created such a scale, and it is now commonly used by NDE researchers.

Let us consider one of these phenomena. In my work, I have approached NDEs as data waiting to be explained, and my model is a form of interactionist substance dualism (ISD). This is a long-standing position on the mind-body problem. The idea is that humans are a *combination* of a material body and a non-material mind, both of which can exist without the other; but, both are necessary for life on Earth. This position was first laid out clearly by René Descartes in the seventeenth century (Viney, 1993), but it attracted immediate criticism—partly because Descartes could not give a model for mind-body interaction. ISD has been consistently rejected by scientists and philosophers and is considered a dead idea.

The example I choose to discuss involves what I call *induced recombination*: mind and body have been separated at the beginning of the NDE but are recombined by an outside stimulus. In operating rooms, for example, some NDErs report being outside their bodies, and the two parts coming together again with great force (Sabom, 1982). Below are some example reports.

NDEs occurring in hospital operating rooms provide an unusual opportunity to learn about the forces at work between the mind and the NDER's physical body. This is probably as close as we can come to a lab setting, and *veridical perceptions* are possible by comparing the NDER's testimony with medical records. Revival of the NDER's body by electric shock provides a distinct off/on transition for the body; NDErs observing this transition during the autoscopic phase (seeing one's body from a position outside the body), which Ring (1980) called Stage 2, are in a unique position to make important observations about the mind/body reunion. The three NDE excerpts below were from surgical patients whose hearts had stopped and who had observed their own revivals by defibrillator:

Case 1: I was up there at the ceiling, watching them work on me. When they put the shocks on my chest, and my body jumped up, I just fell right back down to my body, just like dead weight. The next thing I knew, I was in my body again. (Moody, 1975, p. 82).

Case 2: The nurse was on this side of the bed with that machine. She picked up them shocker things and put one there and one right there [pointing to appropriate places on chest] and I seen my body flop like that. ... It seemed like it just took me and slammed me together,

you know. It seemed like I was apart and then like two forces coming together in a crash. It seemed like I was up here [pointing to ceiling] and it grabbed me and my body and forced it back, pushed it back. (Sabom, 1982. p. 35).

Case 3: I was sitting up there somewhere and I could look down...They thumped me a second time...Then I reentered my body—a transition that was just like that [the snap of a finger]. (Sabom, 1982, p. 35).

Once their physical bodies were resuscitated, each of these NDErs reported an immediate return to the body. In the second account, this returning was likened to the expression of a powerful force, and in the first account, to the force of gravity. It can be seen from these three examples that NDErs vary somewhat in the way they describe an apparently common experience. This variation is consistent with the psychological principle of individual differences in attention, concentration, memory, and verbal skills. It is also important to realize that NDEs are difficult to describe in ordinary language. In most respects, the phenomena reported are beyond our common physical experience. Despite these potential sources of variation, the agreement among the reports above is strong.

Science, in general, begins with observation. Here, we have three observations of the same type of event. If there were only three examples, they could be dismissed in a number of ways. But, NDE science has established (via survey) that millions of NDEs have occurred to people globally. These three cases are the mere tip of the NDE iceberg, and such things have occurred an unknown thousands of times. So far, we have used the principle of *intersubjective agreement* (among the three cases) to establish and explain the existence of this particular phenomenon. But what of the principle of agreement with standard science? We must think carefully about this. The data above suggest that the change in the status of the body (from non-functional to functional) results in recombination. How can this be? What kind of force, as described by these NDErs, could be at work here? Do we need new physics to explain this, or is it beyond explanation?

Luckily, the solution is not new physics, nor impossible to find. The force is *electromagnetism*, a standard area of physics that provides a solution. The body generates an electromagnetic field (EMF) while it is alive. This is due to the tremendous number of charged particles moving

within the body. Magnetic fields are generated when charged particles move. Thus, the human body has a natural EMF. But death puts an end to this EMF, and if the body is resuscitated, the EMF begins again. The fact that the body's EMF can be switched off and on effectively makes the body an electromagnet, a common feature in auto junk yards. And the fact that the mind is affected by the state of the body implies that the two—mind and body—have something in common: the EMF. During life, the two EMFs work together, but this ends with death, when the body EMF goes to near zero. So, status quo science works here and provides an answer to an initially vexing question.

Such success of standard physics in solving the issue of recombination encourages a search for further research along these lines. A second example I find is the tunnel or portal described by those whose NDEs go beyond proximity to the body. I have explored this case extensively elsewhere (Arnette, 1992). Here, I give a brief summary. Many NDErs who have longer, deeper NDEs often report encounters with a tunnel or portal that they enter into, traverse, and emerge from into another reality. As in the recombination case, this tunnel to another world sounds outrageously fantastical and surely must be some kind of illusion or brain malfunction, according to skeptics. But if one is familiar with general relativity, one will immediately notice the similarities between the NDE tunnel and the relativistic wormhole (Einstein-Rosen bridge) predicted by relativity. This realization further cements the relationship between physics and NDEs, and one can take this approach much further (Arnette, 1999).

Thus, my approach extends science to human experience and unlocks the experiential world for investigation. In social science, such research already exists in the form of qualitative research methodology (Taylor et al., 2015). Phenomena such as the NDE can be explored with the model I propose. No longer will people dismiss problematic events as “anecdotal.” I argue that, under the conditions I describe, *they are indeed data*, of a type *otherwise unavailable* to us and supported by my three principles above.

In closing, I would like to address another theory that has recently gained traction in the world of NDE science. This is the so-called receiver theory or filter theory (see e.g., van Lommel, 2013), also known as “non-local consciousness” (NLC). This idea holds that consciousness does not reside in the human body. Instead, it is external and “non-local,” a term that has never been adequately

defined. But some aspects have been described. Consciousness, an external signal, field, or some other entity, is everywhere at once, and individuals tap into it when the brain receives the consciousness signal, filters the information, and results in the individual consciousness we experience. This individuation exists as long as the brain functions, but at death the brain of course also dies, and the signal disappears from the body. There is nothing left of the individual, since that consciousness no longer has a receiver/filter.

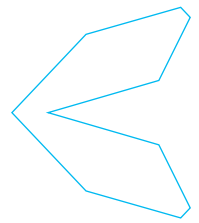
NLC is a theory that is blatantly false and unscientific, a fact that is obvious from the outset. See cases 1-3 above; these reports would be impossible under NLC theory. Many similar examples exist, and overall the data from NDEs are completely incompatible with NLC theory. This theory refutes the very data it is claimed to explain. This is the antithesis of science, which should spring from and explain the data and not refute it. NLC appears to be an attempt to grant the survival of consciousness while denying the survival of individual, differentiated consciousness. But mere examination of NDE data makes clear the survival of the individual's consciousness. It is unclear why NLC seemed necessary to those who created it (such as van Lommel), but my suspicion is that these people fear death and the survival thereof as a threat of some type. Only NLC believers can truly answer the question.

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RESEARCH
ARTICLE

C. elegans Survival Analysis: A New Path to Test Storage and Scalability of Healing Intention

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ABSTRACT

The pathway to widespread access to healing resides in our ability to store and scale the healing intention. Crystal, cotton, and other media have been considered as candidates to accomplish this purpose. The present non-blinded study builds on clinical findings to explore the potential of water to store and scale healing intention using the in vivo model of *C. elegans*, a well-described nematode. Two formulations of informed water, R1 and G1, were produced from capturing healing intention followed by scaling using a proprietary device. R1 had been used in a previous double-blinded, placebo controlled clinical study (Bengston & Nies, 2023). Wild-type and short-lived mutant worms were cultured in the presence of the two formulations of informed water. Treatment with R1 or G1 resulted in a 20% increase of lifespan in the mutant worms when compared to the control water. There was no effect of R1 or G1 on egg-laying capacity. The data from this experiment are strongly suggestive that 1) water is a good medium for the storage of healing; 2) the prepared samples can be replicated by a physical device and are hence scalable; 3) mass-produced informed water may deliver a strong effect on longevity. Future work on additional health conditions needs to be conducted.

KEYWORDS

Water therapies, complementary medicine, storage of healing intention, *C. elegans*.

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INTRODUCTION

Can healing intention be both stored and scaled for widespread use? What media work for storing healing, and how can scaling be accomplished? These are questions that remain unanswered. To allow for widespread use, healing intention must be made storable so that it can be utilized as needed; in addition, healing must be made scalable so that it can be applied to large populations. These two conditions are routinely satisfied in the technology of a variety of traditional medical and non-medical

communities. For instance, drugs can be stored with the potential for future application, and they can be mass-produced to meet wider demand (vitamins, antibiotics, vaccines, etc.). The same holds true for other technologies that can routinely store power, potential, and information for mass production (e.g., batteries). And while healing researchers have by now reasonably demonstrated the reality of what is sometimes called anomalous healing or biofield healing, there has been insufficient work on its storability, and the scalability problem has not been adequately addressed. This

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paper addresses both storage and scalability problems in a controlled experiment that uses informed water as a therapeutic agent in a survival study with *C. elegans* worms.

Background

The examination of the storability of healing was first systematically studied by Bernard Grad at McGill University in the 1950's and '60's (Grad et al., 1961; Grad, 1963). Grad's studies with the Hungarian healer Oskar Estebany showed Estebany's intended healing, while holding pieces of cotton or beakers of water, had the same healing outcome when these substances were administered as surrogates for hands-on treatment. In effect, healing intention was demonstrably able to be stored in a selection of organic and inorganic materials.

Using actual physical devices, Tiller et al. demonstrated that experienced meditators could imprint these with a specific intention (Tiller et al., 2000). These devices, shipped several thousand miles to another lab, could decrease or increase the pH of water by one pH unit and could increase the ATP/ADP ratio in fruit fly larvae so as to significantly decrease their development time.

Jacques Benveniste, in a long series of controversial studies, demonstrated that biological signals could be extracted and recorded, and stored in water, and the playback of these signals to water could reproduce the original biological response (Thomas, 2007). Benveniste called this "digital biology." Beauvais, a former lab employee, analyzed Benveniste's experiments and suggests that Benveniste's findings were rather an experimenter effect (Beauvais, 2018). Following and building upon the inquiries of Benveniste, Nobel laureate Luc Montagnier demonstrated the experimental conditions by which electromagnetic signals of low frequency can be emitted by diluted aqueous solutions of some bacterial and viral DNAs. The recorded electromagnetic signals in water carry the DNA information of the original (Montagnier et al., 2015).

Other methods of storing and scaling healing intention have included using sophisticated EMF detectors inside a Faraday cage, and the signals from the various detectors are combined and reduced to an audio file. These recordings played either to cancer cells in vitro (Beseme et al., 2018) or to mice in vivo (Beseme et al., 2020; Bengston et al., 2023) produced some significant but not well-understood biological effects. By the same token, initial findings are suggestive that the recordings, although producing biological effects, may not be as efficacious as one-on-one healer-to-healee approaches.

These examples illustrate the explorative work in storing and scaling healing intention. As this was a preliminary study to see if the water that proved effective in a double-blinded clinical trial with COVID (Bengston & Nies, 2023) would have an impact on other conditions, the study was not blinded. Experimenter bias, which may come into play when the person performing the experiments knows the materials being used, could have impacted outcomes in this study. Consequently, we suggest this be considered when reflecting on the study and that further research in this direction should be blinded to mitigate this drawback.

Two formulations, R1 and G1, were evaluated in this study. R1 had been previously used in a double-blind, placebo-controlled clinical trial with hospitalized COVID patients (Bengston & Nies, 2023). G1 combines S-Acetyl L-Glutathione (SAG) with R1. Indications are that SAG has antioxidant, detoxification, and anti-aging properties (Arslan et al., 2025; Hamidu et al., 2025). An in vivo model, the nematode *C. elegans*, was used in this study to evaluate R1 and G1 because it has been established as a key model organism for studying longevity and aging, due to its short lifespan, well-characterized genetics, and ease of manipulation.

Goal

To assess the effectiveness and potential scalability of information-infused water therapies in a survival study using *C. elegans*.

METHODS

Treatments

Informed water is the descriptor given to water that carries information, in this case, healing information. In this study, two types of informed water were used, R1 and G1. R1 was produced in a two-step process. During the first step, approximately 6 oz of charcoal filtered tap water was treated for one-half hour by William Bengston using the techniques that he developed (Bengston, 2007, 2010). The treated water was then serially diluted and succussed. Filtered tap water was used in the dilution process. The resulting formula, labeled R0, was used in the second step.

For the second step, R0 was placed in a proprietary device designed and intended to scale and replicate. This device was made of copper, had a hose fitting for water input and output, and a central cylinder into which the material to be duplicated was placed. The output water

moved around the central cylinder. The outgoing water from the device was the informed water, labeled R1, used in these experiments.

G1 is produced by placing R0, described above, in the proprietary device along with a glass bottle containing 86 capsules (100 mg each) of S-Acetyl L-Glutathione (Vita-kruid brand) in the device as above. The outgoing water from the device was labeled G1. The resulting informed waters were stored in three 2-oz colored glass bottles. Filtered tap water from the same water source was used as the control.

Strains and Maintenance

Two *Caenorhabditis elegans* strains were used in this series of experiments: the wild-type strain (# N2, CGC) and the *daf-16* mutant strain (# CF1038, CGC), which is associated with a shortened lifespan. Both strains were provided by the CGC, which is funded by NIH Office of Research Infrastructure Programs (P40 OD010440), and were maintained at 20°C on nematode growth media (NGM) plates seeded with *Escherichia coli* OP50 as a food source.

Survival Experiments

The experiments were not blinded and conducted on pre-treated feeding plates prepared at the beginning of each trial. Nematode Growth Media Agar Plates (60 mm, Teknova; 8 per trial) were seeded with *E. coli* OP50 as previously described (Brenner, 1974). At the same time, 8 drops of the respective water treatments (R1, G1, or control water) were added to the plates. The plates were stored at 4°C and used during the trial to transfer the worms as necessary. For each trial, 10 or 15 nematodes per treatment group were used. Nematodes were transferred to new pre-treated feeding plates every 3 to 4 days to ensure food replenishment and to prevent overcrowding. This also allowed the separation of adult nematodes from newly hatched larvae. The number of living nematodes was counted daily until all nematodes had died. Each treatment condition was assessed in both the N2 wild-type strain and the *daf-16* mutant strain.

Data Analysis

Kaplan-Meier statistical analysis of survival was performed with the online tool OASIS 2 - Online Application for Survival Analysis 2. Access: <https://sbi.postech.ac.kr/oasis2/#>.

ANALYSIS

Effect of Informed Water on Wild Type Strain

We first tested the water on the wild type strain N2 using two treatment modalities – either adding 8 drops of water while preparing the plates with the food source (*E. coli* OP50) prior to transferring the *C. elegans* or adding two drops of the informed water every day. The latter modality did not yield a difference between the control and the treatment groups, suggesting that adding drops every day may not affect lifespan by itself, regardless of the nature of the treatment (data not shown). All further experiments presented in this study were conducted as described in the Method section, with treatment of informed water or control water added prior to adding the worms to the plates.

Figure 1 shows the Kaplan-Meier survival curve obtained from testing the two informed water formulations, R1 and G1, on wild-type worms. While statistical analysis did not show a significant difference, the curve indicated a trend; the informed water seemed to delay the death of worms between 12 and 18 days, but it took the same amount of time (26 days) for all worms to die.

In light of these results, we opted to test the informed water on a mutant with a shorter lifespan (*daf-16* mutant). The rationale was to be able to observe a potential extension of the lifespan.

Historically, only organisms with a “need” respond to healing, whether using treated substances such as cotton or water or direct hands-on. Mice that have a healing need will move to the left hand of the healer. Once they are completely cured, this no longer happens (Benston & Fraser, 2010). Similarly, cells that have a healing need will respond to healing with intent, whether that healing source comes directly from the hands of a healer, or healing apparently stored in substances such as water, cell medium, or cotton. Cells that have no healing need exhibit no anomalous changes when offered healing with intent. And so, at a minimum, it can be posited that biological need is a crucial component in healing, and it may be the healer who instigates the healing effect (Bengston, 2017). The suggestion could be made that the wild-type worms have no need and therefore would not show a response to the informed water. However, we feel it is premature to come to this conclusion from this experiment alone and suggest that this should be explored further.

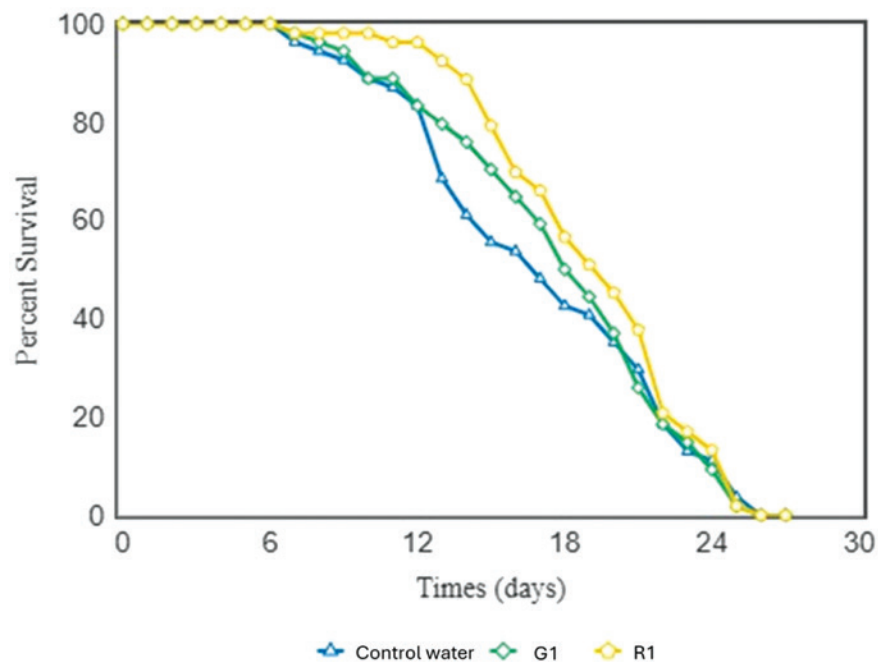


Figure 1. Survival Curve of Wild Type Worms Treated with R1 and G1.

This figure shows the survival curve for a total of 55 *C. elegans* from 4 plates (10 or 15 worms per plate). Each plate was handled independently. Worms were placed on feeding plates pre-treated with control water (blue), G1 (green) or R1 (yellow) and the number of worms was counted daily as described in the Methods section. The survival curve was produced with OASIS-2 (<https://sbi.postech.ac.kr/oasis2/#>). Statistical analysis using a log-rank test did not show a significant difference between the groups.

Effect of Informed Water on Survival of Daf-16 (Short-Lived) Mutant

A first series of 3 independent trials was conducted, including 10 *C. elegans* per trial per plate. Figure 2 shows the survival curve for both treatments (informed water G1 and R1) and the control water. A second control with no water was included in the design of the experiment to keep the worms in their normal settings and yielded the same results as the control water group. For increased clarity, it is not shown on the survival curve.

The survival curve shows that worms treated with informed water had a significantly longer lifespan than worms treated with the control water. The p-values shown on the figure were obtained with a log-rank test, which tests the null hypothesis that there is no difference between the populations in the probability of a death at any time point. The analysis is based on the times (days) of deaths.

The mean survival was 14.13 days (95% C.I. 12.60 - 15.67) for the control group, while it was 16.13 days (95% C.I. 14.44 - 17.83) for G1 and 16.97 days (95% C.I. 15.26 - 18.68) for R1.

To increase the significance of these encouraging results, three more trials were conducted with 15 *C. elegans* each (instead of 10 in the first series).

As in the first series, the worms treated with control water and no water died at the same pace. The difference in survival between the treatment group and the control group was confirmed, and the p-value was lowered to 0.0014 for G1 and 0.0013 for R1.

Because the two sets of experiments were identical in design, execution, and results, the 6 trials were combined for analysis. Figure 3 and Table 1 show results for the 6 trials combined.

Table 1 shows the average lifespan of the treated worms. It was significantly longer for both Informed water groups (G1: 15.3 days, 95% C.I. 14.4-16.2; R1: 15.55 days, 95% C.I. 14.51 - 16.59) compared to the control group treated with control water (12.77 days, 95% C.I. 11.9-13.7). This 20% lifespan extension under the treatment condition is significant, with a $p=0.002$ and $p=0.000042$ when running the log-rank test for G1 and R1, respectively.

Table 2 divides the data into survival percentiles. The worms in the treatment groups generally lived longer, as evidenced by higher mortality ages at each percentile

(25%, 50%, 75%, 90%, 100%) compared to the control water group. For the control group, 25% percent of worms were dead by day 10, while it took 12 days for 25% of

worms to die in the treatment group. This difference of two to three days was maintained throughout the duration of the experiment.

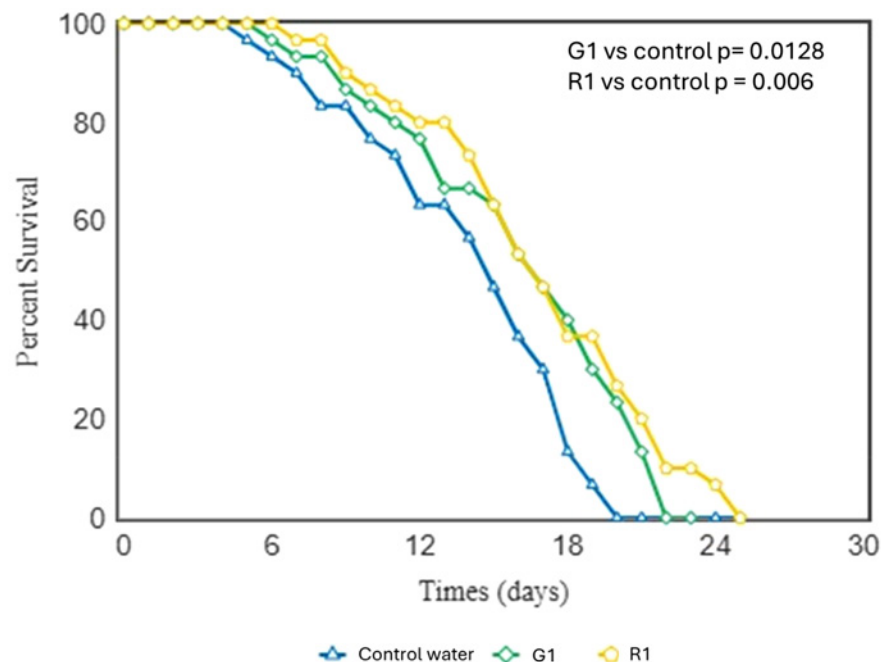


Figure 2. Survival Curve of Daf-16 Worms Treated with G1 or R1 (Trials 1-3).

This figure shows the survival curve for a total of 30 *C. elegans* from 3 plates 10 worms per plate). Each plate was handled independently. The survival experiment was conducted as described in the Method section. The survival curve shows results for the control water group (blue) and the two informed water groups, G1 (green) and R1 (yellow). The p-value was obtained with a log-rank test, comparing the control water group to R1 and G1.

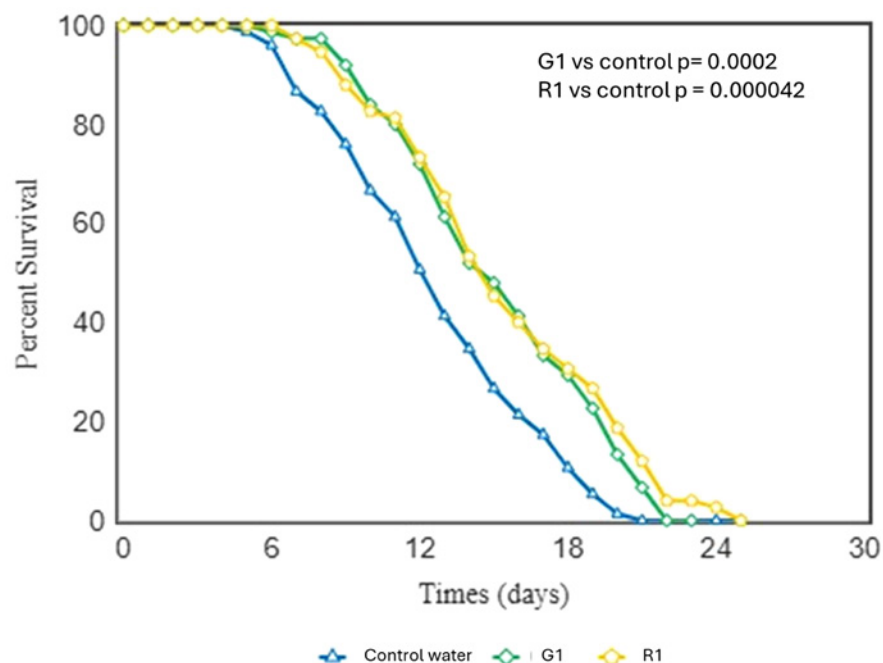


Figure 3. Survival Curve of Worms Treated with G1 or R1 (6 Trials Combined).

This figure shows the survival curve for a total of 75 worms from six independent trials. The survival experiment was conducted as described in the Method section. The survival curve shows results for the control water group (blue) and the two informed water groups, G1 (green) and R1 (yellow). The p-value was obtained with a log-rank test, comparing the control water group to R1 and G1.

Table 1. Average Lifespan of Daf-16 Mutants.

Name	No. of subjects	Average lifespan (days)	Standard error	95% C.I.
Control water	75	12.77	0.47	11.85 ~ 13.70
Informed water G1	75	15.29	0.48	14.35 ~ 16.24
Informed water R1	75	15.55	0.53	14.51 ~ 16.59

Table 2. Mortality Percentile.

Name	25%	50%	75%	90%	100%	95% Median C.I.
Control Water	10.00	13.00	16.00	19.00	21.00	12.0 ~ 13.0
Informed water G1	12.00	15.00	19.00	21.00	22.00	14.0 ~ 16.0
Informed water R1	12	15	20	22	25	14.0 ~ 16.0

Effect of Informed Water on Egg-Laying Capacity of *C. elegans*

In an effort to further characterize the effect of R1 and G1, we investigated the egg-laying capacity of the worms. While we did not explore which stage of development was affected in this lifespan extension, the rationale was that worms that live longer may have a longer reproductive period and therefore lay more eggs than worms living a shorter life. Four trials were run where R1 and G1 were used along with two controls: no treatment and control water, as outlined in the trials above.

Table 3 shows the results of the egg-laying experiment. Eggs were counted under a microscope every day. Adding water (informed or not) tends to slightly increase the egg-laying capacity of the worms (Average: 133.25 (control water); 134.75 (G1), 136.5 (R1), vs 126.75 in the untreated control worms). This effect was not treatment-specific, and this trend was not significant when comparing the treatment groups with a Student's t-test.

Table 3. Egg-Laying Capacity of Treated Worms.

	No treatment	Control water	G1	R1
Trial 1	124	131	127	136
Trial 2	115	141	134	129
Trial 3	141	128	142	139
Trial 4	127	133	136	142
Average	126.75	133.25	134.75	136.5
SD	10.78	5.56	6.18	5.57

DISCUSSION AND CONCLUSION

The present study investigated whether informed water—purported to retain and convey healing information—could influence lifespan and egg-laying capacity in *Caenorhabditis elegans* and whether such effects might support the concept that healing information can be stored, preserved, and scaled for distribution. Using both a standard wild-type strain (N2) and a short-lived daf-16 mutant strain, we evaluated the effects of two informed water formulations (R1 and G1) relative to tap water controls on organismal survival and reproductive capacity.

In wild-type worms, neither formulation produced a statistically significant change in lifespan under the conditions tested, though the survival curves suggested a modest trend toward delayed mortality between days 12 and 18. This lack of statistical significance in the N2 strain may reflect the relatively long baseline lifespan and robust stress-resistance mechanisms inherent to the wild type, which can mask subtle effects.

By contrast, in the daf-16 mutants—an established short-lived strain with impaired stress-response pathways (Lin et al., 2001) — treatment with both informed water formulations yielded a reproducible and statistically significant extension of mean lifespan. Across six independent trials, lifespan increased by approximately 20% relative to the control water. This effect was consistent in both initial and expanded replication trials and was reflected in percentile analyses, which showed a two-to-three-day delay in mortality across all survival thresholds.

Daf-16 is a transcription factor that regulates expression of genes involved in age-related stress response. The mutant used in this study does not express the protein, rendering the worms more susceptible to age-induced perturbations, therefore decreasing the lifespan in the daf-16 null mutant (Li et al., 2019).

These findings suggest that under conditions where physiological resilience is compromised, informed water can produce measurable and biologically relevant effects on longevity. Although this study did not explore the molecular mechanisms of this effect, it is likely that daf-16 is not involved, as the mutant used in this study does not express daf-16. Further mechanistic studies are warranted.

R1 and G1 informed water yielded similar results in this study. Further comparative characterization is necessary to determine whether SAG could enhance the effects of R1. While this was the first time that G1 was evaluated in a study, R1 had previously been assessed with hospitalized

Covid patients. In this double-blinded trial, patients taking drops of the informed water (labeled R1 in the current study) reported significant improvements in a number of symptoms: general feeling, temperature, sore throats, and coughs, as well as higher levels of general health and fewer positive results for viral infection (Bengston & Nies, 2023).

The present results and previous findings from the clinical trial are noteworthy. The observed survival benefits in daf-16 mutants and the improved symptoms of Covid patients were obtained without the direct presence or intervention of a healer during the experiments, indicating that any beneficial property of the water—if linked by cause to the observed effects—was successfully stored and retained from the time of water preparation through to the duration of exposure. This supports the possibility that healing intention, once embedded into water, may be preserved long enough to be used as a practical delivery medium. Moreover, because the same prepared water samples were sufficient to elicit effects across multiple independent trials, the findings are consistent with the concept of “scaling,” in which a single batch of informed water could potentially be distributed to produce similar outcomes in multiple recipients.

The study also examined egg-laying capacity as a secondary measure, motivated by the possibility that extended lifespan might correlate with extended reproduction capability. While adding water to the plates (whether informed or not) modestly affected reproductive output, no treatment-specific differences were detected. This suggests that the mechanism underlying the lifespan effects observed in daf-16 mutants may be associated with a later, non-reproductive phase of the nematode.

Despite these encouraging findings, several limitations must be acknowledged. First, while *C. elegans* provides a well-established model for lifespan research; results in this system cannot be assumed to translate directly to complex organisms without additional mechanistic investigation. Second, although the use of daf-16 mutants allowed for clearer detection of effects, the precise molecular or biophysical mechanism through which informed water might extend lifespan remains unknown. Possible explanations could include changes in water structure, subtle alterations in dissolved solutes, or yet-undetected energetic phenomena, all of which warrant further investigation. Third, while care was taken to standardize plate preparation and handling, future work should explore blinded experimental designs and independent replication to further exclude experimenter

bias. Finally, the study did not directly address the duration of information retention in water under varying storage conditions, which is a critical consideration for real-world scaling applications.

Future research could focus on at least three areas:

1. Mechanistic studies to determine the pathways through which informed water influences lifespan, possibly involving stress-response markers, gene expression profiling, or metabolomic analysis.
2. Scalability and stability tests to assess how long stored healing energy remains active in water and whether large-scale batches retain efficacy across time and distribution.
3. Cross-species validation to determine whether similar effects occur in other model organisms, providing a stronger basis for translational relevance.

In conclusion, this study utilizing *C. elegans* and the previously mentioned clinical trial with Covid patients provides preliminary but compelling evidence that water informed with healing intention may retain properties capable of influencing biological outcomes, at least under certain physiological conditions. The reproducible extension of lifespan in daf-16 mutant *C. elegans* worms and the results of the COVID study suggest that such information can be stored and later delivered via water without direct healer intervention, offering a potential pathway for scalable distribution. These results lay the groundwork for deeper exploration into both the fundamental nature of informed water and its practical applications in extending health and vitality. Both studies indicate that R1, and potentially other informed water formulas, could open a large area of interesting study, such as what conditions R1 can be effective on, the effect on severity and length of condition, etc.

Returning to the larger questions of storability and scalability, the data from this non-blinded experiment and the previous clinical trial are strongly suggestive that 1) water is a good medium for the storage of healing intention (Bengston & Nies, 2023), 2) the prepared samples can be replicated by a physical device and is hence scalable (Bengston & Nies, 2023), 3) mass-produced informed water can deliver a strong effect on Covid (Bengston & Nies, 2023 and potentially longevity. As mentioned earlier, future blinded research needs to be conducted to verify the results of this study. We also suggest that studies be conducted to test the informed water on the impact on additional health conditions.

NOTES

The informed water described in this study is available to any researcher wishing to replicate the findings or to collaborate upon request to the corresponding author.

AUTHOR CONTRIBUTIONS

Sarah Beseme: Investigation, Formal Analysis, Writing - Original Draft. Jeremy Lins: Investigation. William Bengston: Conceptualization, Methodology, Writing - Original Draft, Funding acquisition. Margaret Nies: Writing - Original Draft. John McMichael: Conceptualization, Methodology, Writing - Original Draft.

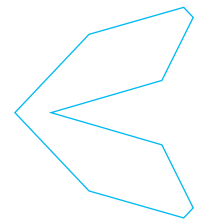
CONFLICT OF INTEREST

William Bengston is the developer of the Bengston Energy Healing Method.

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RESEARCH
ARTICLE

Changes in Scores Throughout the Day in Wordle, a Word-Puzzle Played by Millions of People: Is Morphic Resonance at Work?

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ABSTRACT

The current study is an extension of two previous studies using the five-letter word puzzle Wordle to test whether there was an improvement in player performance throughout the day that might be suggestive of morphic resonance. Players have six attempts to solve the puzzle. The previous studies, which used WordleBot to obtain continuously updated performance statistics for millions of players, found inconsistent results. In the first study, the percentage of players solving in one to three attempts increased throughout the day. In the second study, success rates declined across all six attempts. To increase sensitivity in the current study, we sampled over a much longer time span, starting with samples at 4:00 a.m. New Zealand Daylight Time (NZDT), near the International Date Line, where each new day's puzzle is launched, followed by samples around midday GMT, and ending with samples near midnight Hawaii Standard Time (HST), close to the end of the international day (giving a total span of 43 hours). The results showed that there is a repeatable pattern whereby there is an increase throughout the day in the percentage of players solving the puzzle in one or two attempts, and a decrease in players solving it in four to six attempts. We discuss possible explanations for this pattern, including time-of-day effects, cheating, precognition, and morphic resonance.

KEYWORDS

Wordle, morphic resonance, time-of-day effects, puzzle solving, psi, precognition.

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The current study is an extension of two previous studies we carried out using the five-letter word puzzle, Wordle, to test whether there was any consistent pattern in player performance throughout the day that might be consistent with morphic resonance (MR) (Black et al., 2026). The hypothesis of MR proposes the existence of a new type of field, morphic fields, which have an inherent memory (e.g., Sheldrake, 1988). Once an organism learns a particular skill, that pattern of learning becomes

embedded within a morphic field to which similar organisms can tune in. The embedded patterns act like blueprints, facilitating faster learning for subsequent organisms practicing the same skill.

Wordle is a free online game published by the New York Times (NYT) that is played by millions of people every day (NYT employee, personal communication, June 10, 2025). Wordle gives players six chances to guess a particular five-letter word. Each guess provides clues: specifically, different



colors indicate whether any of the letters in the guessed word are in the target word, and whether they are in the correct place. For example, if the target word is *FORUM* and a player guesses *ROUND*, the *O* in the guess turns green, the *R* and *U* turn orange, and the *N* and *D* turn grey. The goal is to guess the word in as few attempts as possible. Table 1 illustrates two example guess sequences for the target word *FORUM*. Player 1's first guess is *ADIEU* (a word commonly used by Wordle players as an initial guess). Player 1 makes five additional guesses, filling the six available guess slots and correctly identifying the target word on their sixth attempt. The color-coding used by Wordle—signified by the feedback column in Table 1—allowed the player to determine which letters were in the target word and incorporate these clues into subsequent guesses. Player 2, by contrast, begins with *ROUTE* (a more effective guess for this particular target word) and solves the puzzle in three attempts. Accordingly, Player 2 was more successful at solving this particular puzzle because they guessed the target word in fewer attempts.

As well as publishing a new Wordle puzzle every day, the NYT also makes available an online tool called WordleBot, which enables players to find out how their performance compares with other players who have done Wordle on the same day. Players can see an analysis of their responses only after they have completed the puzzle, which grades them on a scale of 0 to 99 in categories including skill and luck, compared with the average at that time in the day. It also provides statistics on other players' performances. This makes it possible to study how millions of people are performing on Wordle throughout the day. The new Wordle is published at

midnight in each time zone, starting at the International Date Line, which means that apart from a few Oceanic islands, the first populous country in which it is published is New Zealand.

If MR is at play and is a linear effect, we would expect players to guess the target word in fewer attempts as the day progresses, owing to progressively increasing resonance from players who have already completed the puzzle (see Black et al., 2026, for an in-depth literature review supporting this idea). MR is a speculative interpretation. Consequently, there could, of course, be alternative reasons for this type of finding, which we will also discuss in this article. That said, our primary aim in the present study was to explore whether either of the patterns observed in our preliminary WordleBot-based studies could be replicated, and whether this type of finding might be reasonably attributed to MR.

In an initial study, we sampled WordleBot data in the morning and at night, based on the British time zone, over a 12-day period, and found an increase in the percentage of players solving the puzzle in one or two attempts from morning to evening. However, when we repeated the study over a 30-day period, there were decreases across all six attempts (Black et al., 2026). In the current study, we repeated our initial study with a longer time span between samples to find out which, if either, of the previous results was repeatable. In our previous studies, the morning samples were collected at 6:00-8:00 a.m. GMT, and the evening samples were collected at 10:30-11:59 p.m. GMT, covering a time span of around 14.5 to 18 hours. The data provided by WordleBot is based on a random sample of all Wordles that have been completed so far that day (NYT employee, personal communication, June 10, 2025). Consequently, there was probably some overlap in the morning and evening samples across time zones that might have made it more difficult to tease out any changes throughout the day. Accordingly, the current study has refined the experiment by taking an earlier morning sample, a sample around noon, and a later evening sample to make the test more sensitive, enabling us to compare changes in the earlier and later parts of the international day, and to extend the total time span to around 43 hours.

METHOD

Research Design

The current study used WordleBot to assess the Wordle scores of randomly selected groups of Wordle players at

Table 1. Illustrative Example of a Wordle Guess Sequence.

Attempt	Player 1	Player 1	Player 2	Player 2
	Guess	Feedback	Guess	Feedback
1	ADIEU	XXXXO	ROUTE	OGOXX
2	CRUST	XOOXX	RUMOR	O O O O O
3	MOURN	XGOOX	FORUM	G G G G G
4	ROUND	OGOXX		
5	RUMOR	O O O O O		
6	FORUM	G G G G G		

Note. This table illustrates two different solving trajectories for a Wordle puzzle with the target word *FORUM*. The feedback columns indicate the color-coding used by Wordle for each letter in a guess: X = letter not in the target word (grey in Wordle); O = letter in the target word but in the incorrect position (orange in Wordle); G = letter in the target word and in the correct position (green in Wordle).



different times of the day. WordleBot allows players to compare their score to the average performance of other players around the world. For instance, WordleBot provides the percentage of players who solved the puzzle on each of the six attempts, allowing for an assessment of whether there is a change in average player performance throughout the day. These percentages are based on a random sample of all Wordle players, not only of those who are using WordleBot (NYT employee, personal communication, June 10, 2025).

For 30 distinct Wordle puzzles released between February 20 and April 7, 2025, Georgia Black (GB) completed Wordle and subsequently collected the accompanying WordleBot data (i.e., the percentage of players solving the puzzle on each of the six attempts) at three different times throughout the day (morning, midday, and evening). Our previous study design was refined by using a VPN (Virtual Private Network) to collect the morning and evening WordleBot data from the early morning in one of the earliest time zones, in New Zealand, and from the late evening in one of the latest time zones, Hawaii, to maximize the time between data collection periods. This allowed us to obtain a much smaller morning sample size and, consequently, to reduce the overlap between the samples. A midday sample was also taken, based on the British time zone, to allow further identification of any time-of-day effects. As a result, for each of the 30 Wordle puzzles, GB collected the morning sample at 3:00 p.m. GMT (4:00 a.m. in New Zealand), the midday sample at 12:30 p.m. GMT the following day, and the evening sample at 9:50 a.m. GMT the day after (11:50 p.m. in Hawaii). Consequently, each day of data collection spanned over three days. Ethical approval was not required for the present study, as WordleBot data is publicly available and does not necessitate informed consent.

Participants

Across the 30 days tested, WordleBot randomly selected an average of 17,309 morning players, 1,792,447 midday players, and 1,785,679 evening players (morning range: 14,306 to 21,380; midday range: 1,787,041 to 1,800,998; evening range: 1,780,499 to 1,790,390). WordleBot does not provide demographic information for its players. Given that Wordle resets at midnight for each time zone, the geographic distribution of Wordle players changes throughout the day (NYT employee, personal communication, June 10, 2025).

Materials

Wordle

The study required GB to complete the NYT Wordle puzzle, which is freely available online. The solution to the puzzle is a five-letter word that changes daily.

WordleBot

WordleBot is a tool published by the NYT that provides comparative data of other Wordle players' performance around the globe. The tool uses the official NYT Wordle to produce its data, and the comparative data is based on a random sample of all players who have completed that day's puzzle so far (NYT employee, personal communication, June 10, 2025). The specific data that was collected from WordleBot was: a) the sample size, b) the target word, and c) the percentage of players solving the puzzle on each of the six attempts. The percentages given by WordleBot are cumulative: for instance, if 38% of players solved Wordle within three attempts, this includes players who solved Wordle in one, two, or three attempts.

VPN

To complete Wordle and collect the accompanying WordleBot data in different time zones, a Private Internet Access VPN (Virtual Private Network) subscription was purchased. We selected this specific VPN because it had servers in both New Zealand and Hawaii—in two of the earliest and latest time zones, respectively. The VPN allowed GB to complete Wordle as if she were located in these countries.

Procedure

On each of the 30 days tested, GB completed Wordle and subsequently collected the accompanying WordleBot data at three different times (morning, midday, and evening). Wordle resets at midnight for each time zone. Consequently, for the morning data, GB changed the time zone of her device and used the VPN to connect to a server in New Zealand to access the new Wordle puzzle before it had been released to the rest of the world, and collect the accompanying WordleBot data, at approximately 4:00 a.m. New Zealand Daylight Time (NZDT). This time was chosen to ensure that the WordleBot sample size was sufficiently large, whilst minimizing the overlap with the later samples. On a separate device which was connected to GB's local time zone in

England, she checked that the solution to Wordle was different to ensure that the VPN was working correctly.

The midday WordleBot data was collected at approximately 12:30 p.m. GMT and therefore did not require the VPN, as GB is located in the United Kingdom. For the evening sample, the VPN was used to connect to a server in Hawaii to collect the WordleBot data when most people around the globe had completed that day's Wordle. The evening data was collected at approximately 11:50 p.m. Hawaii Standard Time (HST). These specific times were selected to ensure that they were spread apart evenly. In total, GB solved Wordle 30 times and collected the accompanying WordleBot data 90 times (three for each day). Owing to the differing time zones, the data collection spanned a three-day period for each day collected. Consequently, data was collected for 30 Wordle days, but the actual data collection process took 32 days in total. Most days were collected in February and March, 2025, at 4:00 a.m. NZDT (3:00 p.m. GMT), 12:30 p.m. GMT the following day, and 11:50 p.m. HST (9:50 a.m. GMT the day after). There was therefore a gap of approximately 21.5 hours between each data collection period (morning to midday and midday to evening).

Data Preparation

Prior to analysis, the relevant WordleBot data was input into an Excel spreadsheet. The average morning, midday, and evening sample sizes were calculated across the 30 days tested. The average percentage of players guessing correctly on each of the six attempts was also calculated across the 30 days tested for each time (morning, midday, and evening). This resulted in three percentages for each of the six Wordle attempts (18 in total).

To prepare for a non-parametric analysis using a sign test, the change in success rate between each data collection time was marked as either an increase (+), decrease (-), or no change (=). There were therefore three comparisons: morning to midday, midday to evening, and morning to evening. This was done for each day and for each of the six Wordle attempts (resulting in 90 symbols for each of the six attempts; 540 in total). For each attempt and each time period, the number of increases, decreases and no changes was calculated. For example, for attempt one, for the period morning to evening, there were 24 increases (+), no decreases (-), and six instances of no change (=).

Statistical Analysis

To determine whether the changes in the percentage of players solving the puzzle on each of the six Wordle

attempts differed significantly from chance, a sign test was performed for each time period and attempt (three for each Wordle attempt; 18 in total). Days showing no change were excluded from the analysis. We used the binomial test with the null hypothesis that the number of days on which the score increased or decreased should be approximately the same.

To determine whether there was a change in player performance as the day progressed, 18 two-sample z tests for proportions were carried out. For each of the six Wordle attempts, three tests were performed (18 in total): one test analyzing the change between morning and midday, one between midday and evening, and one between morning and evening. The effect sizes were calculated using Cohen's *h*. Given the exploratory nature of the study, statistical significance was determined as $p < .05$ for all analyses, with a focus on pattern detection rather than emphasizing statistical significance.

RESULTS

While the current findings are descriptive and exploratory, the results revealed a clear pattern of change throughout the day. The percentage of players solving the puzzle in one or two attempts significantly increased, and the percentage solving in four to six attempts significantly decreased. There was little change on the third attempt. The same pattern was shown in the periods morning to midday, midday to evening, and morning to evening, and was statistically significant using two different procedures.

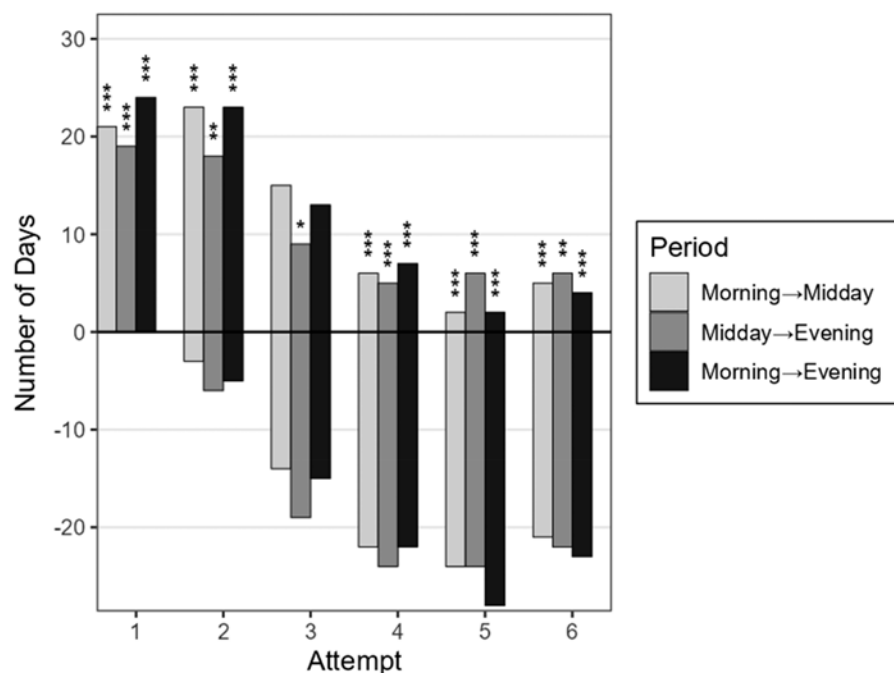
For the non-parametric method using a sign test, the data from each attempt on each day were scored plus (+), minus (-), or equal (=) depending on whether the proportion of people solving the puzzle in that number of attempts increased, decreased, or stayed the same (Table 2). By chance, the number of days with an increase should have been about the same as those with a decrease, but on the first two attempts, there were significantly more increases than decreases, and on the last three attempts, significantly more decreases than increases (Figure 1). Attempt three showed little difference, aside from the period midday to evening, which showed significantly more decreases.

The second statistical procedure employed a two-sample z test for proportions. As the day progressed, the increased percentages of players solving the puzzle in one or two attempts were most significant for the periods midday to evening and morning to evening (Table 3). The z test revealed a decrease in the percentage of players solving the puzzle in the latter four attempts as the day

Table 2. Number of Days on Which Players Solving the Puzzle in One to Six Attempts Increased or Decreased at Later Times.

Attempt	Time period	<i>n</i>	Increases	Decreases	Percentage effect	<i>p</i> value
1	Morning to Midday	21	21	0	100%	< .0001
	Midday to Evening	19	19	0	100%	< .0001
	Morning to Evening	24	24	0	100%	< .0001
2	Morning to Midday	26	23	3	88.5%	< .0001
	Midday to Evening	24	18	6	75%	.01
	Morning to Evening	28	23	5	82.1%	.0005
3	Morning to Midday	29	15	14	51.7%	.5
	Midday to Evening	28	9	19	32.1%	.04
	Morning to Evening	28	13	15	46.4%	.42
4	Morning to Midday	28	6	22	21.4%	.002
	Midday to Evening	29	5	24	17.2%	.0003
	Morning to Evening	29	7	22	24.1%	.004
5	Morning to Midday	26	2	24	7.7%	< .0001
	Midday to Evening	30	6	24	20%	0.0007
	Morning to Evening	30	2	28	6.7%	< .0001
6	Morning to Midday	26	5	21	19.2%	.001
	Midday to Evening	28	6	22	21.4%	.002
	Morning to Evening	27	4	23	14.8%	.0002

Note. *n* refers to the total number of days analyzed after no-change days were excluded. The Increases column indicates the number of days showing an increase in the percentage of players solving the puzzle on that attempt during the relevant time period, and the Decreases column indicates the number of days showing a decrease. The Percentage effect column represents the proportion of *n* showing an increase. The *p*-value refers to the one-tailed *p*-value of the binomial test.

**Figure 1.** Direction of Success Rates on Each Wordle Attempt.

Note. This figure shows the number of days on which there was an increase or decrease in the percentage of players solving Wordle at each of the six attempts for each time period. Asterisks indicate significance by the binomial test: * = *p* < .05; ** = *p* < .01; *** = *p* < .001.

Table 3. Two-Sample z Test for Proportions.

Statistic	Attempt 1	Attempt 2	Attempt 3	Attempt 4	Attempt 5	Attempt 6
Morning to Midday						
Morning (%)	0.3	4.91	27.83	62.26	85.75	96.01
Raw number	52	850	4,817	10,777	14,842	16,618
Midday (%)	0.39	5.16	27.81	61.7	84.99	95.65
Raw number	6,991	92,490	498,480	1,105,939	1,523,401	1,714,476
Percentage effect (%)	+0.09	+0.25	-0.02	-0.56	-0.76	-0.36
Direction of trend	Increase	Increase	Decrease	Decrease	Decrease	Decrease
z score	1.96	1.44	0.039	1.5	2.79	2.31
p value	.050	.150	.969	.134	.005	.021
Effect size	0.016	0.011	0.0003	0.011	0.022	0.018
Midday to Evening						
Midday (%)	0.39	5.16	27.81	61.7	84.99	95.65
Raw number	6,991	92,490	498,480	1,105,939	1,523,401	1,714,476
Evening (%)	0.48	5.26	27.51	60.99	84.31	95.35
Raw number	8,571	93,927	491,240	1,089,086	1,505,506	1,702,645
Percentage effect (%)	+0.09	+0.1	-0.3	-0.71	-0.68	-0.3
Direction of trend	Increase	Increase	Decrease	Decrease	Decrease	Decrease
z score	12.94	4.4	6.48	13.79	17.93	13.68
p value	< .001	< .001	< .001	< .001	< .001	< .001
Effect size	0.014	0.0047	0.0069	0.015	0.019	0.014
Morning to Evening						
Morning (%)	0.3	4.91	27.83	62.26	85.75	96.01
Raw number	52	850	4,817	10,777	14,842	16,618
Evening (%)	0.48	5.26	27.51	60.99	84.31	95.35
Raw number	8,571	93,927	491,240	1,089,086	1,505,506	1,702,645
Percentage effect (%)	+0.18	+0.35	-0.32	-1.27	-1.44	-0.66
Direction of trend	Increase	Increase	Decrease	Decrease	Decrease	Decrease
z score	3.48	2.03	0.94	3.4	5.2	4.11
p value	< .001	.042	.348	< .001	< .001	< .001
Effect size	0.03	0.016	0.0072	0.026	0.04	0.032

Note. This table includes success rates based on the average morning, midday, and evening sample sizes of 17,309, 1,792,447, and 1,785,679, respectively, which were calculated across the 30 days tested. The Raw number row indicates the estimated number of players based on the average sample size and percentage guessing correctly provided by WordleBot (the latter was also averaged over the 30 days tested). The effect size was calculated using Cohen's *h*.

progressed. The decreases were again most significant for the periods midday to evening and morning to evening, and were generally most prominent for attempts four to six. All results had very small effect sizes.

DISCUSSION

The results showed a clear and consistent pattern of change throughout the day. There was an increase in players solving the puzzle in one or two attempts as the day went on, and a decrease in players solving the puzzle in four to six attempts. This pattern is very similar to that

observed in our initial WordleBot-based study by Black et al. (2026). Our second study in Black et al. (2026) did not show this pattern, which is one reason that we undertook the present investigation, using a wider span of times to find out if the initial results were repeatable. We regard the present study as stronger evidence for this effect than the earlier results because the wider time span gave more opportunity to see any daily patterns. Additionally, our three sampling times enabled us to make morning to midday comparisons as well as from midday to evening, and both time periods showed the same trends (Tables 2 and 3), providing additional evidence for a systematic



effect throughout the day. In the previous study there were only two sampling times spaced at 14.5-18 hours apart, whereas in the current study, the three sampling times were about 21.5 hours apart from each other, giving a total time span of around 43 hours. This was made possible by sampling in the early morning from New Zealand, near the International Date Line, where the new day begins, and from late night in Hawaii, near the end of the day.

Although the effect sizes in the present study are small, we suggest that the observed pattern is worthy of further investigation. Small effect sizes are common in several areas of research, such as social psychology and parapsychology (e.g., Richard et al., 2003; Cardeña, 2018), and can nevertheless be practically meaningful. For example, as noted by Cardeña (2018) in the context of psi research, small aggregate effect sizes may reflect the averaging of larger effects manifested by a select subset of participants and smaller or null effects among others. This illustrates that certain effects cannot be expected to manifest uniformly across individuals, resulting in small effect sizes even when a genuine underlying effect is likely present. Moreover, the replication of the same directional pattern observed in our initial WordleBot-based study suggests that this effect might not be attributable to random variation alone. Accordingly, we will start by discussing conventional factors that could have influenced changes in Wordle scores throughout the day, such as time-of-day effects and cheating, and then turn to alternative explanations, including possible MR effects.

Conventional Explanations

First, there is the possibility that the increases in players succeeding on the first two attempts were responsible for the decreases on later attempts. This is because increases in earlier attempts leave fewer players available to solve the puzzle on later attempts, meaning that some level of decrease at later attempts is expected. Assume for the

purposes of argument that there is a fixed total for the number of players, say 100, and that the number of players solving the puzzle on the first two attempts increased by 10, then the number of players solving the puzzle on the later attempts would have to decrease by the same amount so that the total remained 100. However, this does not seem to have been the case here. The cumulative total at attempt six was not fixed at 100% (some players failed to solve the puzzle in the allocated six attempts), but decreased during the day from an average of 96.01% to 95.35% (Table 3). When we look at the increments at each successive attempt (Table 4) rather than the cumulative percentages in Table 3, the total increase from morning to evening in the first two attempts was 0.35%, whereas in the next three attempts, there was a total decrease of 1.79%. On the final attempt, there was a positive increment of 0.78%, with an overall decrement of -0.66% for all six attempts. We can conclude that the decrease in attempts three, four, and five is not a result of the increase in attempts one and two, but a real decrease. The decrease on attempt three of -0.67% was partially masked by the cumulative percentages as shown in Table 3, but shows clearly when we look at the increments in Table 4. The net decrease indicates that the portion of the decline in later attempts not accounted for by the initial increases is balanced out by a small increase in the proportion of players who failed to solve the puzzle within six attempts.

Second, the pattern of results could have been due to time-of-day sampling effects. The morning samples taken at 4:00 a.m. NZDT would have included answers given by people in New Zealand, which contains the first significant settlements west of the International Date Line, where the new day's Wordle puzzle is first launched, together with answers from eastern and central Australia, where it was 2:00 a.m. and 1:30 a.m., respectively. Thus, the sample at 4:00 a.m. NZDT would have included only the results from people who did the puzzle in the early hours of the morning. Presumably, most responses in this time slot would be

Table 4. Incremental Changes in the Percentage of Players Solving Wordle in Successive Attempts.

Sample	Attempt 1	Attempt 2	Attempt 3	Attempt 4	Attempt 5	Attempt 6	Total
Morning (%)	0.3	4.61	22.92	34.43	23.49	10.26	96.01
Midday (%)	0.39	4.77	22.65	33.89	23.29	10.66	95.65
Evening (%)	0.48	4.78	22.25	33.48	23.32	11.04	95.35
Change (Morning–Evening)	0.18	0.17	-0.67	-0.95	-0.17	0.78	-0.66

Note. Percentages represent incremental proportions of players solving the puzzle at each specific attempt, derived from cumulative WordleBot percentages (which were averaged over the 30 days tested). The Change (Morning–Evening) row reflects the difference between morning and evening incremental percentages for each attempt.

from people who stay up very late or are insomniacs. Thus, some of the differences between the morning sample at 4:00 a.m. NZDT and the later samples might be attributed to time-of-day effects, where people may respond differently when doing the puzzle in the early hours of the morning, compared with those doing it later in the day. Indeed, effects of circadian rhythms on cognitive performance have been found with respect to attention, working memory, and executive functions—processes crucial to the performance of tasks involving problem solving (Valdez et al., 2012). Changes in performance throughout the day are also driven by sleep inertia and homeostatic sleep drive (Wright et al., 2012). Wright and colleagues (2012) suggest that sustaining wakefulness at night past the habitual sleep time results in a vulnerable period of cognitive impairment. This might help explain the lower proportion of players solving the puzzle in fewer attempts in the morning sample.

The samples throughout the day are cumulative, hence the midday sample taken at 12:30 p.m. GMT would have included results not only from people in the United Kingdom (and Europe more generally) who did the puzzles in the morning, but from the entire day in New Zealand and in parts of the afternoon and evening in other time zones east of the United Kingdom. By contrast, the evening sample at 11:50 p.m. HST contains cumulative data spanning almost all hours of the day in all time zones and thus would have a full range of results from people who did the puzzle in the morning, afternoon, and evening. It is therefore possible that some of the effects we observed could depend on the fact that the midday and evening samples included people later in the day, who might have responded differently than people in the early morning (Tables 2 and 4; Figure 1). Valdez and colleagues (2012) suggest that for a healthy individual who sleeps from 11:00 p.m. to 7:00 a.m., performance reaches its highest level between 4:00 p.m. and 10:00 p.m., and decreases from 10:00 p.m. to 4:00 a.m. Such circadian cycles may help explain the increased proportion of players solving the puzzle in one or two attempts in the midday and particularly evening samples, given that a large percentage of players might have completed the puzzle during peak performance hours. The morning sample, by contrast, includes players solving the puzzle between midnight and 4:00 a.m. NZDT (when performance in healthy individuals decreases). Additionally, if success on the first two attempts depends more on leaps of intuition, or “luck”, as described by WordleBot, and later attempts on “skill”, then perhaps in the morning, people use their intuition

less and logical reasoning more, whereas later in the day, there may be the opposite tendency.

It should be noted that the time-course of cognitive performance throughout the day can vary due to an individual’s chronotype (individual differences in the sleep wake cycle), as well as sleep deprivation and various sleep disorders, making it difficult to determine the exact impact of circadian rhythms on this dataset, particularly for the morning sample which could include both healthy people staying up late and individuals with sleep disorders (Valdez et al., 2012). Furthermore, the above-chance percentage of players guessing the correct word in one or two attempts in the morning sample is difficult to reconcile with the reduced cognitive performance that is associated with the circadian cycle during these hours.

It is also possible that the pattern of results is due to people cheating by looking up the Wordle solution in social media groups or elsewhere. As the day goes on, there will be more online reports of the answer, making it easier to cheat. A study by Tapparita (2023) conducted in 2022 on Wordle players’ habits in the United States found that about 10% of 1,087 admitted to cheating. However, the observed pattern of an increase throughout the day in players solving the puzzle in one or two attempts, and a decrease in players solving the puzzle on the later attempts would suggest that cheating, if it occurs, happens primarily on the first two guesses. If cheating is to explain the increased proportion of players getting the puzzle right throughout the day on the first attempt, and to a lesser degree on the second attempt, this would mean that people were cheating before they even started the puzzle.

Wordle is a single-player game: aside from wanting to beat a fellow player’s score, there are minimal external incentives to cheat (particularly on the initial guess, as this effectively eliminates the purpose of the game). As Dilger (2023) admitted—despite arguing that correct guesses on the first attempt can only be explained by rampant cheating—it would make more sense for players to cheat as they use up their guesses and become increasingly frustrated. This is in line with the findings of Passmore et al. (2020): in a mixed-methods analysis of 188 U.S. players’ cheating beliefs and experiences, they found that cheating is endorsed in single-player contexts to facilitate mood repair and satisfy psychological needs as they play the game. Specifically, they found that 43% of participants used cheating for self-regulation purposes such as stress relief, and that most players only cheat under specific circumstances as opposed to all the time. These factors point towards a higher likelihood of cheating on the later

Wordle attempts when most guesses are used up, and there is a clear purpose to cheating if they had failed to find the answer by attempts four, five, and six. We would therefore expect to see cheating increase, and the percentage of players solving the problem on the later attempts go up, but in fact they went down. Furthermore, 78% of participants reported using cheating to boost the enjoyment of a game (Passmore et al., 2020). Cheating on the first Wordle attempt would directly contradict this goal because it would eliminate the entire purpose of the game. It is also worth noting that 36% of Wordle players use the same starting word each day (Taparia, 2023). This suggests that at least a third of players are unlikely to cheat on their initial guess. With these considerations in mind, the cheating hypothesis does not seem easily compatible with the increases seen on attempts one and two. Hence, the results cannot easily be accounted for on the cheating hypothesis without speculations to explain why people would cheat more later in the day on the first two attempts, rather than on the third, fourth, fifth, and sixth. The increase in failure rates throughout the day (i.e., players failing to solve the puzzle in the allocated six attempts) is also not easily compatible with the cheating hypothesis.

An additional explanation for the increased guess proficiency throughout the day is that changes in the geographic distribution of the player samples as the day progresses could affect Wordle performance due to population-level variables. For example, differences in cognitive or educational indicators, such as national IQ estimates, could in principle influence Wordle scores as different nations become more represented throughout the day. However, the relevance of such factors is difficult to observe in the current dataset as specific country-level participation is not known, and measures such as IQ are highly contested. Moreover, some populous countries often cited as having higher average IQ scores (e.g., China and Japan; World Population Review, 2026) may have reduced access to or lower engagement with the official Wordle (for instance, due to access restrictions or language and character differences). Additionally, if such countries did contribute substantially to official Wordle data, they would be expected to inflate the average scores of earlier samples, rather than provide an explanation for the increasing percentage of players guessing the target word in one or two attempts as the day progresses.

In addition, country-level differences in Wordle performance reported elsewhere do not align straightforwardly with the present findings (e.g., Gardner, 2022; Iancu, 2025). Several countries reported to have above-average Wordle performance (such as Sweden, Switzerland, and Australia)

would be expected to contribute to success rates in the morning or midday samples but would not explain an increase in more efficient solve rates in the evening sample. By contrast, later samples are likely to have a higher proportion of U.S. players who have been reported to use a higher number of guesses than the world average (Gardner, 2022; Iancu, 2025). Taken together, these considerations indicate that population-level variables such as estimated IQ or average Wordle performance are unlikely to provide a sufficient explanation for the increase in guess efficiency seen throughout the day (though they may help explain the above-average success rates on attempts one and two in the morning sample, and the increase in players failing to solve the puzzle within six attempts in the evening sample). Perhaps the explanation lies at the individual level instead: midday and evening samples may increase the likelihood of sampling highly skilled players due to the substantial increase in sample size from morning to midday and evening. However, without more detailed statistical modeling, it is difficult to determine whether this represents a sufficient explanation for the observed pattern.

Linguistic differences across various English-speaking nations might also affect the accuracy of player guesses across time zones (e.g., *MUMMY* vs. *MOMMY*). If *MOMMY* was the target word, players in the United States are likely to have fewer erroneous guesses than players in the United Kingdom, perhaps leading to a higher proportion of players guessing the correct word in fewer attempts later in the day due to the time zone of the United States being behind that of the United Kingdom. Though, as mentioned, U.S. players may take a higher-than-average number of guesses, despite the puzzle being in American English (Gardner, 2022).

Alternative Explanations

It is possible, although speculative, that the pattern of results could be partly due to morphic resonance. The MR hypothesis suggests that as more and more people solve the puzzle, it should become easier for others to solve it, and scores should improve as the day goes on. The increments analysis outlined above shows that while some decrease on later attempts is expected (even with improved scores), the observed decreases exceed what can be explained by the increases on attempts one and two, and overall failure rates increase slightly. These increased failure rates are not easily reconciled with MR. However, MR might be worth considering as an interpretation for the observed increases in the proportion of players solving the puzzle on the first



two attempts. Possibly, MR from previous players who had completed the puzzle earlier in the day helped subsequent players select the right word more successfully on the first and second attempts. If MR were the only factor, however, increases could theoretically appear on any attempt, as long as overall, more players solved the puzzle in fewer attempts. This raises the question of why improvements in both our initial WordleBot-based study (Black et al., 2026) and the current study were concentrated on the first two guesses.

Assuming that MR did contribute to our results, one possible explanation for the observed trend could be that conscious cognitive processes reduce susceptibility to MR (Black et al., 2026). Players have more clues to work from as the game progresses, resulting in an increase in conscious problem-solving strategies on later attempts. As suggested by Vernon et al. (2021), cognitive processes might inhibit MR. Vernon and colleagues designed an experiment to test this hypothesis: specifically, they tested whether non-Chinese speaking participants implicitly preferred real or decoy Chinese characters, based on the notion that implicit tasks need not engage conscious cognitive processes. While the predicted preference for real characters was not found, the authors noted that half of the participants had completed an explicit task first, which might have introduced unwanted explicit processes and undermined the experiment's ability to test the original premise. Indeed, when Schwartz (described in Sheldrake, 2012) conducted an MR experiment by asking participants to guess the meaning of Hebrew words and to rate their confidence in their guesses, he found that when participants guessed wrongly, they rated themselves more confident when viewing real Hebrew words instead of scrambled words. However, when Schwartz informed participants of the purpose of the experiment, the results were no better than chance. This suggests that they were unable to do consciously what they had done unconsciously.

The idea that MR operates unconsciously mirrors literature suggesting that psi phenomena—which are similarly subtle—might be best categorized as unconscious processes. In Carpenter's (2004) First Sight Model, for instance, it is suggested that psi processes *precede* and *initiate* preconscious psychological processes, and as such, they serve as bridges toward the development of conscious awareness. Carpenter suggests that this psychic activity can only be glimpsed by suspending cognitive work. Similarly, in a meta-analysis of 90 precognition experiments, Bem et al. (2016) suggest that fast-thinking protocols are likely better suited for detecting psi because they minimize

conscious cognitive strategies that may interfere with the unconscious nature of psi functioning. Indeed, several studies have demonstrated similarities between psi and unconscious psychological processes (e.g., Schmeidler, 1986; Roney-Dougal, 1987). Perhaps MR is best understood under a similar model. If MR exists and operates similarly to other unconscious psychological processes, this might explain why MR would be most prominent for the initial two Wordle attempts (rather than attempts three to six): perhaps in the absence of intense cognition (such as problem-solving strategies) on the first Wordle attempt in particular, the player is open unconsciously to tune into the answer through MR. On the later Wordle guesses, increased cognition might drown out MR (which would presumably still be present in the background by virtue of the player engaging in the particular pattern of activity).

One remarkable feature of all Wordle data, not just the 30-day sample described here, is the surprisingly high proportion of players getting the word right on the first attempt (e.g., Dilger, 2023). There are around 9,000 five-letter words in the official Scrabble dictionary, and Wordle has a pool of about 13,000 five-letter words that are valid guesses, of which more than 3,000 have already been used. Therefore, on any given day, the possible number of correct solutions is in the thousands. We will take a conservative figure of 5,000 for the purpose of argument, meaning that on any given day, there would be a 1 in 5,000 chance of guessing the word on the first attempt by chance, or in other words, a probability of 0.0002, or 0.02%. But in the current study, the percentage of players getting the word right on the first attempt in the early morning was 0.3, and in the evening, 0.48, respectively, which is 15 to 24 times more than would be expected by random guessing. Moreover, about a third of the people who play Wordle do not randomly guess the first word but start with a standard five-letter word like *ADIEU* or *SLATE* (Taparia, 2023), so the pool of people guessing the first word is smaller than the number of players, further reducing the chances of getting it right by guessing.

At first sight, this surprisingly high success rate on the first attempt seems to support the cheating hypothesis, but an analysis by two staff members of the NYT suggested several other explanations: some people might be using a new window to make additional guesses after failing to solve the problem in six attempts, and some might be re-entering a solution they found on a different device to maintain a winning streak, or to test a technical issue (Katz & Bhatia, 2023). Katz and Bhatia did not explore the possibility that this effect might also depend on MR or on

psi phenomena like telepathy with others who had already played the game, or even a kind of precognition or presentiment that could have enhanced their success rate in guessing (e.g., Bem et al., 2016). However, MR or telepathy seems unlikely to account for the above-chance success rate at 4:00 a.m. NZDT, because the number of people who had already solved the puzzle was very small, and yet almost as many got it right the first time as those included in the midday sample taken at 12:30 p.m. GMT, 0.3% compared with 0.39%.

Perhaps precognition or presentiment is worth considering here: in several studies, free-response conscious precognition tasks have shown that participants are able to describe the contents of a target that is randomly selected only after the participant has submitted their impressions (Mossbridge & Radin, 2018). For instance, May (2014) found that three previously high-scoring participants had a statistically significant hit rate when describing target images that were subsequently selected by software. It might be worth exploring whether a similar precognitive effect could explain the above-chance percentage of players solving Wordle in one attempt, before any social or environmental cues could provide information.

Limitations and Prospects for Future Research

One problem with all these interpretations is that they depend on data derived from WordleBot. The processes by which WordleBot samples data from the millions of players who have done Wordle on any given day are opaque, and the owners of Wordle and WordleBot, the NYT, will not disclose how their procedures work. We cannot rule out the possibility that the patterns we have detected are an artifact of the sampling algorithms. This makes further research on the subject difficult unless the NYT were to do the research themselves, using their large database, or supply the data to others to make a detailed analysis. For the time being, the results can only be tentative. We can find no clear explanation for the pattern whereby the percentage of players solving Wordle in one or two attempts increases significantly during the day, while the percentage failing to solve the puzzle within six attempts also increases.

Another limitation of using Wordle and WordleBot to investigate performance changes throughout the day is that the samples only include Wordle players, and consequently, predominantly individuals who particularly enjoy word puzzles. Many players are likely repeat players who may have developed a greater aptitude for word-based

problem-solving than the general population. It would be interesting for future research to investigate whether such time-of-day effects are observed with non-Wordle players solving the same puzzles. Such research would be particularly pertinent for testing the MR hypothesis, given that MR should theoretically apply to anyone engaging in the puzzle.

An additional limitation of the present study is that the large number of statistical tests that were conducted could increase the possibility of Type I error rates (i.e., finding a statistically significant result simply due to running multiple tests). Future studies might consider conducting fewer tests and/or using statistical techniques that take into account very large sample sizes.

A further limitation worth considering is whether Wordle is an ideal task for testing the MR hypothesis specifically. In theory, engaging in the puzzle itself may tune players into resonance from all previous Wordle players, regardless of the target word or day. For instance, many players use a strategic starting word such as *ADIEU*. Repeated use of such starting words may cause the player to resonate with themselves and other players who started with this word in the past, as well as with the associated solution pathways that followed. This accumulated resonance may mask any resonance specifically associated with the current target word. Moreover, MR proposes that morphic fields are associated with and facilitate the perception of words more generally (Sheldrake, 2012). Consequently, resonance from the historical use of English words could add to the noise, making it even more difficult to isolate any day-specific MR effects. Despite this noise, we did observe an increase throughout the day in players solving the puzzle in one or two attempts. However, as discussed, the relatively high proportion of players solving the puzzle on the first attempt in the morning sample, and the increase in the proportion of players failing to solve the puzzle within six attempts from morning to evening, are difficult to reconcile with a straightforward MR interpretation. With these considerations in mind, Wordle and WordleBot may be better suited for investigating psi phenomena, such as presentiment, precognition, and telepathy, for which accumulated past resonance would be less problematic. MR may be better investigated using genuinely novel tasks in which no prior resonance is associated with the task being tested.

Implications and Methodological Applications

Although our findings are tentative, this study illustrates the potential of working with large data sets sampled in



real time and repeated every day. Methodologically, our findings highlight the benefits of repeated sampling in detecting temporal patterns, whilst also cautioning that opaque algorithms can complicate analysis and interpretation. Our findings also suggest that future research in the field of parapsychology might benefit from further exploring the high Wordle success rates on the first two attempts, and highlight the potential of integrating digital platforms into parapsychological and cognitive research. Such approaches offer a low-cost, alternative avenue for investigating these phenomena outside of the laboratory.

CONFLICT OF INTEREST

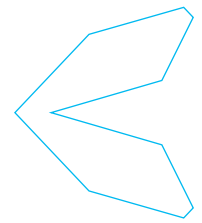
We have no known conflict of interest to disclose.

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RESEARCH
ARTICLE

Unexpected Extemporaneous Anomalous Reactions (UNEARs) and their Relationship with Meditation

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ABSTRACT

The beneficial effects of meditation have attracted increasing scientific interest, particularly regarding the mechanisms through which this ancient practice may contribute to health recovery and maintenance. Nevertheless, despite the broad range of benefits attributed to meditative practices, the literature also reports numerous unusual experiences related to meditation. This study describes reports from three novice practitioners of meditation who experienced unexpected reactions, including headache, sudden sialorrhea, sudden heat in the body, drowsiness, feeling indisposed, an increase in anxiety and aggressiveness, jealousy, crying episodes, a desire to discontinue meditation practices, feeling faint, anguish, and fear of consciousness leaving the body, among others. These reactions are referred to here as “unexpected extemporaneous anomalous reactions” (UNEARs) — a phenomenon linked to the multidimensionality of the Being that may, in some cases, result from the confrontation between the practitioner and the Self shaped by an individual’s life experiences over time. With basis on qualitative data collected from semi-structured meditation diaries containing three open-ended questions that allowed practitioners to describe in detail any experienced reactions, and considering empirical observations of several dozen novice practitioners in previous meditation courses, the current study aims to propose an etiological hypothesis comprising three inducing factors that may act as “triggers” of UNEARs: (I) failures in the execution of the exercises, (II) the adaptation of the Being’s multidimensional body to meditation, and (III) the “unearthing effect” of meditation. These factors may contribute to the development of further rigorous investigations into the possible existence of a subtle human anatomy composed of *chakra* systems and *nadis*, as well as its relationship with anomalous experiences associated with certain holistic and alternative practices.

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KEYWORDS

Meditation, Unexpected Extemporaneous Anomalous Reactions (UNEARs), Mind-Body, Non-Ordinary Experiences (NOEs), Subtle Energy.

INTRODUCTION

The benefits attributed to meditation have been widely described in scientific literature and are commonly associated with the recovery and maintenance of health, as well

as improvements in quality of life. As a result, meditation has gained widespread popularity worldwide, a phenomenon further amplified by media dissemination. Despite this favorable scenario, it is important to note that, since the 1960s, researchers have also highlighted the potential



risks of meditation (Deikman, 1963; Epstein & Lieff, 1981; Shapiro Jr, 1992; West, 1979).

Over the past decade, a growing body of research has documented unwanted effects (Cebolla et al., 2017), unpleasant experiences (Dudeja, 2019; Schlosser et al., 2019), adverse events (Farias et al., 2020), adverse effects (Lambert et al., 2023; Pauly et al., 2022; Szaszko & Tran, 2025), negative effects (Sparby & Sacchet, 2025), and unusual experiences (Van Dam et al., 2025) related to meditation practices. Increasingly, these studies have raised concerns about both the effectiveness and safety of meditation as a therapeutic intervention for various clinical conditions, including psychiatric and psychological disorders.

Although hypotheses concerning the etiology of these events and their causal relationship with meditation remain scarce, several authors have provided important insights that contribute to a more comprehensive understanding of the phenomenon. Early studies suggested that the negative impact of meditative practices on health may be related to over-meditation of long-hour sessions (Carrington, 1977). However, more recent evidence indicates that even a short meditation session may reduce motivation to engage in both mundane and enjoyable tasks (Hafenbrack & Vohs, 2018) and may also produce negative consequences in the moral domain by attenuating harm-based moral reactions (Schindler et al., 2019). Taken together, these findings suggest that the potential risks related to meditation may be independent of practice duration, whether measured in minutes, hours, weeks, months, or years.

One of the most intriguing questions surrounding meditation is “*why some practitioners experience unpleasant effects during or after practice, whereas others do not.*” Considerable attention has been devoted to determining whether such outcomes are linked to the type of meditation (Cebolla et al., 2017; Szaszko & Tran, 2025), individual differences (Buric et al., 2022), prior clinical history (Graser & Stangier, 2018), or non-clinical conditions (Lambert et al., 2023). More recently, the scientific community has expressed increasing concern regarding this issue, leading to proposals for the development and validation of assessment inventories designed to evaluate a broad range of meditation-related experiences (Van Dam et al., 2024; Wilkinson et al., 2023).

This field of scientific inquiry remains vast, allowing for the development of new paradigms that may contribute to a deeper understanding of phenomena of such magnitude linked to meditation. In this sense, the current study

describes unexpected reactions reported by three novice meditation practitioners who attended one of the meditation courses offered at the University of Brasília, Brazil, between 2007 and 2013 (Camelo, 2011; Fernandes, 2010, 2016). These reactions were documented through qualitative data derived from participants’ meditation diaries. To mitigate or eliminate such reactions during the course, participants received support from an experienced instructor who implemented tailored intervention strategies based on the issues reported.

Additionally, the present study includes examples of both pleasant and nuisance reactions identified during empirical observations of other novice practitioners who attended meditation courses of the same offered modality, and from some Brazilian medical students who took meditation classes between 2018 and 2019 and evaluated the quality and relevance of meditation in medical education (Fernandes, 2023). Further examples were drawn from reports provided by undergraduate students from various academic fields enrolled in the course *Meditation: Theory and Practice* at the Faculty of Medicine of the University of Brasília, from 2024 to the first half of 2026. These participants attended classes in which they practiced *Meditation with Intentionality* (MI), a meditation modality developed by the author of the present article. Briefly, this modality primarily involves the use of controlled breathing techniques aimed at quieting the mind, combined with the deliberate use of intention-driven thoughts to promote mental balance. These components are intended to support students in taking initial steps toward the development of self-knowledge and self-transformation.

The association between meditation and the emergence of various nuisance reactions does not necessarily imply that this ancient practice—whose primary aim is to promote well-being and support individuals’ spiritual development—is a major cause of physiological or psychological imbalance. Rather, such reactions may be related to factors including the misuse of meditation, insufficient instructor expertise regarding its full range of effects, and, importantly, a lack of consideration of individual differences, such as personality traits, religious beliefs, atheism, or skepticism, and how these factors influence individuals’ responses to meditation.

The first aim of this study is to propose that reactions commonly described as pleasant or unpleasant, unwanted, adverse events or side effects, as well as unusual or anomalous experiences, may be conceptualized as Unexpected Extemporaneous Anomalous Reactions (UNEARS). These

reactions constitute a common phenomenon that manifests across physical, mental, and spiritual dimensions, presenting as signs or symptoms that may arise during or after meditation practices.

Given that this phenomenon may occur in both novice and experienced practitioners, regardless of the meditation modality, and considering that the qualitative approach adopted in this study enabled three novice practitioners to report their experiences in detail through meditation diaries, the second aim is to propose an etiological hypothesis. This hypothesis comprises three potential inducing factors underlying the relationship between UNEARs and meditation: (1) failures in the execution of exercises, (2) adaptation of the Being's multidimensional body (physical, mental, and spiritual) to meditation, and (3) the "unearthing effect" of meditation.

CONCEPTUAL CONSIDERATION OF UNEARS

UNEARS are reactions that manifest across the multidimensionality of Being (physical, mental, and spiritual) in response to stimuli arising from holistic practices, among others. The term UNEAR was coined to encompass a range of reactions related to meditation (Lindah et al., 2017), yoga (Cramer et al., 2019), acupuncture (Xu et al., 2023), and hypnosis (Gruzelier, 2000).

These reactions are considered anomalous insofar as they deviate from commonly expected patterns of experience. They are described as extemporaneous because they may arise prematurely or at inopportune moments, including during the early stages of an intervention, such as the first weeks of meditative practice. They are characterized as unexpected because their occurrence during or after meditation is independent of any prior manifestation of will or thoughts endowed with intentionality. Therefore, these reactions are not necessarily generated by self-induction or expectation. Lastly, these reactions may be associated with behavioral changes and processes related to the development of the Self at different stages of individual experience. Overall, in the specific context of meditation, such reactions are not typically aligned with the predefined goals of daily practice and may emerge within a few days among novice practitioners or also occur in experienced meditators.

UNEARS can be classified as either pleasant or nuisance reactions. Pleasant reactions represent the beneficial effects of meditation manifested across physical, mental, and spiritual dimensions, including improvements in breathing, attention, and concentration; reductions in

pain, stress, and anxiety; the development of patience, tolerance, and altruism; and increased feelings of loving-kindness and peace.

Nuisance reactions, in contrast, manifest as signs or symptoms that, at least initially, may evoke feelings of mistrust, insecurity, or even fear in practitioners. These reactions can be further subdivided into those of a pleasant or unpleasant nature. Reactions of a pleasant nature may be interpreted as beneficial or pleasurable effects of meditation, yet they may sometimes be accompanied by feelings of insecurity and/or fear. For example, practitioners with their eyes closed may unconsciously visualize beams of light, colors, or luminous figures of various forms during practice, or may feel as though their consciousness is leaving the body.

Based on the empirical observations of the present study, some practitioners reported out-of-body experiences or entering altered states of consciousness (i.e., meditative states), during which they described extra-physical journeys to previously unseen places. In both cases, such experiences occurred during simple, controlled breathing exercises aimed at quieting the mind. Although pleasant, these reactions may be unprecedented for some practitioners, and reports of fear are therefore common. Out-of-body experiences have been reported among Chinese Buddhist monks and nuns (Chen et al., 2011). However, it has also been proposed that such phenomena may reflect mystical states associated with endogenous neurochemical processes, such as the synthesis of the hallucinogen 5-methoxy-dimethyltryptamine (DMT) (Newberg & Newberg, 2005), or a failure in the temporo-parietal junction (TPJ) (Blanke & Arzy, 2005).

Nuisance reactions, particularly those of an unpleasant nature, may manifest in the physical body in several ways. The most commonly reported include increased blood pressure, tachycardia, sudden sensations of heat, sweating, and pain. In the mental sphere, these reactions may appear as anxiety, depression, anguish, and anger, among others. Such responses often lead to behavioral changes. However, despite their seemingly harmful nature, their occurrence calls for a broader and more holistic interpretation. In some cases, they may represent a stage in the practitioner's spiritual and behavioral development. Of particular note are the reactions that arise when the practitioners experience a UNEAR related to the process of self-knowledge. Such reports are common among individuals who feel shocked upon encountering their Self as revealed through meditation.

INDUCING FACTORS IN THE ETIOLOGY OF UNEARS IN MEDITATION

Recent investigations into meditation-related experiences have focused on the characterization of adverse or unpleasant effects in psychological settings (Lambert et al., 2023) and psychiatric contexts (Goud, 2022; Tamlinson & Malhotra, 2024). Notably, a potential association between meditation practices and depersonalization phenomena has been suggested (Cebolla et al., 2017; Lindahl & Britton, 2019; Lindahl et al., 2019). Within this context, several outstanding questions warrant systematic investigation. Specifically, which forms or techniques of meditation may facilitate the emergence of UNEARs within the mental domain? Furthermore, given the heterogeneity of unusual meditation-related experiences, are there identifiable precipitating or moderating factors that selectively contribute to the occurrence of UNEARs across distinct experiential dimensions of Being?

The identification of potential inducing factors related to meditation constitutes an important area for further scientific investigation. Despite its limitations, the present study suggests a possible causal relationship between the UNEARs phenomenon and the inducing factors outlined below. This proposal is supported by systematically collected experiential data documented in meditation diaries, the intervention strategies employed by the meditation instructor to mitigate or eliminate these reactions, and the observed outcomes of these strategies.

Failures in the Execution of Exercises and Their Impact on the Subtle Anatomy of the Being

The concept of a “subtle anatomy of the Being”, comprising the *chakra* system and *nadis*, has been described within traditional and theoretical frameworks (Bruyere, 1994; Motoyama, 1981), often in association with physiological structures such as glands and organs of the physical body. According to these teachings, *chakras* are understood as vital centers responsible for the absorption and distribution of subtle and vital energy, whereas *nadis* are described as subtle channels through which this energy circulates within the subtle body, analogous—at least conceptually—to blood vessels (vascular networks). This form of energy is variably referred to in the literature as *prana*, *ki*, *chi*, biofield (Belal et al., 2023), biometenergy (Castellar et al., 2014), life energy (Rosch, 2009), or as a universal life force or an energy principle (Ramacharaka, 1904), among other terms. Within these perspectives, such a vital force is often regarded as a

fundamental principle underlying the generation and organization of the material world, encompassing both inanimate and living systems.

Chakras and *nadis* are thus conceptualized as interactive interfaces linking physical, mental, and spiritual dimensions, contributing to the maintenance of systemic balance through the regulation of subtle energy flow. It has been proposed that *chakras* may influence physiological processes and overall health status. In this context, imbalances or deficiencies in these energy systems have been suggested to be associated with the development of pathological conditions (Huang, 2020, 2021a, 2021b, 2022; Jadon & Sharma, 2025; Marathe & Acharya, 2020).

In addition to established health-related factors—such as regular physical activity, adequate nutrition, and supportive social relationships—certain theoretical perspectives propose that the maintenance of the functional integrity of the seven primary *chakras* may contribute to overall well-being. From this standpoint, the proper functioning of these centers is considered relevant to the maintenance of physical, mental, and, where applicable, spiritual health. Accordingly, Table 1 summarizes the proposed relationships between the *chakras* and the multidimensional aspects of Being, considering both conditions in which these centers are described as operating in a balanced and integrated manner and states characterized by functional imbalance.

The collected data contributed to the identification of UNEARs manifested by practitioners of a specific meditation modality involving breathing and visualization techniques aimed at quieting the mind and directing *prana* toward selected targets according to intentional focus. In addition, participants underwent structured meditation training designed to facilitate the activation and rebalancing of the *chakra* system (Fernandes et al., 2012). Difficulties in the accurate execution of these practices were frequently observed among novice practitioners, particularly in exercises involving *chakra* activation. Within the theoretical framework adopted in this study, *chakras* are conceptualized as components of a multidimensional system involved in the recovery and maintenance of health. From this perspective, an imbalance in one *chakra* may influence the functioning of others, potentially disrupting the overall dynamics of the subtle-body system. For instance, practitioners may inadvertently overstimulate specific *chakras* or fail to adequately activate those considered foundational within the prescribed sequence of practice.

The isolated hyperactivation of a single *chakra* is sufficient to cause the disruption of the *chakra* system,

Table 1. A Brief Description of the Relationship between the Seven Main Chakras and the Human Physical, Mental, and Spiritual Dimensions.

Chakras	Dimensions and harmonious functioning of the <i>chakras</i>			Dimensions and imbalances in the functioning of the <i>chakras</i>		
	Physical	Mental	Spiritual	Physical	Mental	Spiritual
First <i>chakra</i>	Excretion and locomotion; metabolism; regulation of the kidneys, bladder, genitals, colon and rectum. Glands: adrenals	Practical meaning of life; sense of administration and realism; well-defined and creative ideas; ease in communicating and expressing oneself clearly; willpower; control of materialism; family support.	Spiritual discernment; understanding of one's own existence and significance, as well as that of other living beings; distinction between mysticism and reality; and analysis and acceptance of life adversities.	Adrenal dysfunctions; urinary disorders; hemorrhoids; varicose veins; lower back pain; nephritis; cystitis; irritable bowel syndrome; and gastrointestinal disorders.	Difficulty expressing oneself in a creative, spontaneous, and flexible manner; lethargy, fatigue, depression, anxiety, fear of change, fear of abandonment by family, friends, or spouse, and fear of loneliness; and the development of aggressive behavior.	Greedy; avarice; excessive gullibility; material addictions; denial of feelings, emotions, and non-tangible dimensions of reality; tribalism and fanaticism; and excessive materialism.
Second <i>chakra</i>	Reproductive organs; kidneys; ureters; bladder; urethra; rectum; and pelvic structures innervated by the lumbar plexus. Glands: gonads.	Creativity; security; courage; sexual equilibrium; risk-taking and decision-making abilities; self-defense and self-protection; and emotional balance.	Ethics and honor in affective and professional relationships; mastery over passion and selfishness; independence of consciousness; and social and sexual pleasure at a balanced level.	Genitourinary and obstetric disorders; sexual dysfunctions; pathological alterations of the uterus, ovaries, and bladder; urinary incontinence; lower back pain; arthritis; and menstrual disturbances.	Aggressive personality; exaggerated and fantasy eroticism; hyperactivity; verbiage; impulsivity; lack of creativity; envy, lust, jealousy, promiscuity; difficulty in communication.	Tendency to self-destruction and collective destruction; possessiveness; envy; lust; feelings of guilt and accusations; overly sensitive.
Third <i>chakra</i>	Digestive system; peritoneal cavity; diaphragm; muscles of the thoracolumbar and abdominal region; structures innervated by the solar plexus. Organs: liver, pancreas and spleen.	Self-esteem; self-discipline; storage center for subtle and vital energy in the form of thoughts, emotions, and feelings; regulation of emotions and feelings stored within it; and relationship with sensations of pleasure and pain.	Understanding of diverse thoughts, ideas, and cultures; sensible interpretation of life adversities; generosity, ethical awareness, strength of character, and respect for others; and awareness of the Self associated with spirituality.	Decreased diaphragmatic mobility; digestive system disorders; diabetes; obesity; flatulence; abdominal distension; bowel obstruction; chronic fatigue; and pain in the lower thoracic spine.	Loss of behavioural/emotional control; depression; claustrophobia; low self-esteem; rigid and stubborn thoughts and beliefs; resistance to change; compulsive seduction; affective dependence; fear of rejection; exaggerated sentimental density.	Egocentric personality; heightened sensuality and sentimentalism; excessive compassion; self-punishment; need to conquer everything and everyone; arrogance; thirst for power; need to be the center of attention; exaggerated sexual fantasies; and heightened importance attributed to physical appearance.
Fourth <i>chakra</i>	Lungs; heart; thymus; shoulders; breasts; arms; hands; brachial plexus; ribs; clavicles; thoracic vertebrae; and the immune system. Gland: thymus. Organ: heart	Empathy and sympathy; discernment; natural leadership oriented toward collective well-being; insight; emotional balance; serenity; and positive mental attitudes and habits.	Awareness of the Self; discernment between intellectual and spiritual intelligence; altruism; generosity; hope; remorse (recognition of mistakes); and romantic, agape, noble, and unconditional love.	Respiratory and cardiovascular disorders; hypertension; impairments of the shoulders, hands, arms, and vertebrae; breast disorders; sleep disorders; shortness of breath; tachycardia; tremors; and immune system dysfunction.	Depression; anxiety; crying episodes; sleep disorders; feelings of anguish, fear, and inferiority; lack of confidence; social isolation; being hostage to painful memories; exaggerated self-love; and affective and professional distrust.	Pride; selfishness; feelings of hurt, hatred, bitterness, and aversion; inability to forgive; fear of loneliness and betrayal; inflated ego; refusal to accept help; difficulty expressing feelings and crying; and a need to be in control of situations and appear strong.
Fifth <i>chakra</i>	Mouth (teeth, tongue, gums, cheek); salivary glands; jaw; facial mimic muscles; cervical vertebrae; neck muscles; larynx; trachea; vocal cords; thyroid; communication and swallowing. Gland: thyroid	Balance between reason and emotion; mental magnetism; creativity; decision-making ability; capacity to process emotions for transformation and release; and ability to establish and maintain healthy affective and professional interpersonal relationships.	Ease in expressing feelings; self-reflection; good discernment; awareness of one's relationships with oneself and others; balance among the subconscious, conscious, and superconscious processes; access to the individual and collective unconscious; faith; and interest in the search for truth.	Verbiage; spasms and pain in the throat; voice changes; neck tics; sensation of a lump in the throat; frequent throat clearing; disturbances of the pharynx, larynx, trachea, and tonsils; neck pain; thyroid dysfunction; facial and neck dermatitis; sexual dysfunctions; asthma; bronchitis; chronic and acute colitis; irritable bowel syndrome; diarrhea; parathyroid disorders; hoarseness; and respiratory and gustatory impairments.	Thoughtless attitudes and mental habits; paranoid tendencies; shyness; excessive introversion and insecurity; agoraphobia; inability to express feelings; repressed emotions; negative intellect; rude language; and misuse of knowledge.	Excessive rationalism; difficulty reflecting on one's feelings; feelings of guilt and fear; inability to change direction in life; conflicts with self-image and with beliefs about the existence of God; confrontation with one's own altruistic convictions; and fear of cultivating self-faith.



Table 1. (continued)

<i>Chakras</i>	Dimensions and harmonious functioning of the <i>chakras</i>			Dimensions and imbalances in the functioning of the <i>chakras</i>		
	Physical	Mental	Spiritual	Physical	Mental	Spiritual
Sixth <i>chakra</i>	Hypothalamus; limbic system; vestibular system; cerebellum; visual system; auditory system; cranial nerve innervation; nasal structures; olfactory system. Gland: pituitary	Awareness of mental activity; resilience; neural, cognitive, and psychophysiological balance; clear and interpretive perception of life experiences; capacity to discriminate truth from illusion; creative thinking; innovation; and the ability to make complex decisions with wisdom and fairness.	Awareness of unconditional love; knowledge; wisdom; justice; altruistic and self-transcendent emotions; dignity; self-esteem; respect and reverence; ability to reflect on one's actions and experience regret.	Headaches; migraines; dizziness; auditory, visual, olfactory, and neurological disorders; impaired motor coordination and balance; ophthalmological disorders; brain diseases; dyslexia; cervical spine arthritis; and increased susceptibility to infectious diseases.	Impairment of the sleep-wake cycle; psychiatric disorders; anxiety; sadness; hyper-rationality; mental rigidity; intellectual arrogance; seeks to influence others through intellectual dominance and force of mind; may occasionally demonstrate indecision and irrationality; emotional indifference; and intellectual blockage.	Anger; wrath; disbelief and skepticism; latent or impaired intuition; lack of moral courage; exacerbated pride; rejection of spiritual knowledge or a higher intelligence; a changeable and unstable, and/or excessively intellectualized, cold, and calculating personality; seeks to dominate feelings and emotions through reason.
Seventh <i>chakra</i>	Cerebral cortex; skull; central sulcus; scalp. Gland: pineal	Awareness of the importance of positive attitudes and healthy mental habits; awareness of spiritual intelligence; transcendence; open-mindedness; empathy; and the ability to undergo the process of mental transmutation.	Balance of the Being in its multidimensionality; agape love; faith; altruism; hope; compassion; self-knowledge and self-transformation; insight; feelings of happiness and inner peace; and spiritual fulfillment.	Photophobia; heightened sensitivity to sound and environmental stimuli; headaches; insomnia; migraines; multiple sclerosis; ophthalmological disorders; and epilepsy.	Hallucinations; delusions; phobias; insanity; melancholy; depression; apathy; frustration; excessive intellectualization overriding spiritual intelligence; and misuse of knowledge.	Exacerbated materialism and pride; arrogance; skepticism; lack of discernment and openness toward spirituality; difficulty in self-giving; unethical use of religion and integrative practices for manipulation and deception; tendency toward hatred, self-destructive behavior, and revenge; and lack of purpose in life.

Note. This table was developed based on the bibliographic materials authored by Avalon (1953), Motoyama (1981), Chase (2018), as well as on the theoretical and practical frameworks of two meditation modalities: *Pranic Meditation* and *Meditation with Intentionality* (MI).

eliciting a systemic imbalance in the multidimensional body. This is a colossal mistake that results in the stagnation of the subtle and vital energy flow throughout the *nadis*, due to the accumulation of dense “energetic masses” within the *chakras* and at specific points along the *nadis*. These energetic patterns form clusters of “etheric dirt” that can be perceived by practitioners with clairvoyant abilities. It has been described as resembling a sticky, goop-like etheric substance that impairs the circulation of subtle and vital energy throughout the subtle body. These masses appear to consist of subtle energy in the form of thoughts, emotions, and feelings generated by the eager student who mistakenly overstimulates the *chakras* during meditative practice. The obstruction of vital energy circulation in the body has been discussed in the literature on the concept of “thought-forms,” which emphasizes that negative thought-forms can hinder energy flow by adhering to the *chakras* and other energy points (Claude, 2022). According to this view, negatively valenced or persistent thought patterns may contribute to disruptions in the flow of vital energy by becoming associated with specific energetic centers. Thought-forms are visible in the mental aura by an adapted vision (clairvoyant, mediumistic) (Claude, 2022). Therefore, following this line of reasoning, the hyperactivation of the *chakras* may lead to the “densification” of negative thoughts generated by the mental system of novice students who hold anxious expectations that meditation will resolve all their life problems.

Conversely, insufficient or absent stimulation of a *chakra* during practice may result in reduced vitality, thereby impairing the proper circulation of vital energy that sustains the functioning of other *chakras*. According to the principles of certain holistic practices, such as acupuncture, living beings are understood to possess an internal energy referred to as *Qi*. Within the framework of traditional Chinese medical philosophy, the balance of *Qi* is considered essential for optimal health, whereas illness and disease are understood to arise from imbalances or disruptions in its flow (Chon & Lee, 2013). Therefore, maintaining balance in the functioning of the *chakra* system, as well as ensuring the proper circulation of subtle energy, is regarded as crucial for preventing the emergence of clinical complications.

Taken together, these perspectives underscore the theoretical importance of maintaining balance in the functioning of the *chakra* system and in the circulation of subtle energy, particularly within the context of meditative practices, as a means of minimizing potential adverse experiences.

Adaptation of the Multidimensional Body (Physical, Mental, and Spiritual) of the Being to Meditation

This inducing factor is proposed here based on the principles of ancient Eastern traditions, as described in Western publications from the nineteenth to the twenty-first centuries. According to these principles, the human being is composed of multiple bodies or planes (Besant, 1897, 1917; Heindel, 1953; Ramacharaka, 1906, 1909), which function and interact with one another to maintain the animic condition of the Being. In brief, these bodies are commonly described as physical, etheric, emotional, mental, and spiritual. Together, they constitute what may be termed the “Multidimensionality of the Being”. For clarity, the five bodies are referred to in this study as dimensions. To facilitate understanding of their relationship with UNEARs and for didactic purposes, these dimensions are grouped into three categories: physical (corresponding to the biological body), mental (mind), and spiritual. Within this classification, the etheric and emotional bodies are subsumed under the spiritual dimension.

From a metaphysical perspective, the multidimensionality of the Being is composed primarily of physical (cells, organs, and systems), mental (a complex mental system), and spiritual (*chakra* system and *nadis*) dimensions, with the latter representing the essence of the Self within each individual. If we take into consideration that these dimensions interpenetrate and interact with one another, both health and disease may be associated with the balance or imbalance of the cellular activity, the mental system, and the *chakra* systems and *nadis*. In this context, the present study discusses how the harmonious or disharmonious functioning (i.e., hypo- or hyper-energized conditions) of the seven main *chakras* may be related to the emergence of UNEARs in meditation practitioners.

According to ancient yogic principles, *prana* is taken up during breathing by the *chakras* and subsequently redistributed throughout the body via the *nadis*, thereby contributing to cellular vitality (Ramacharaka, 1904). Should a *chakra* initially be in a hypoactive state (i.e., low energy), it passively receives a flow of subtle energy that tends to activate it, thereby supporting both its functional balance and the overall functioning of the *chakra* system. On the other hand, should one of the *chakras* be in a hyperactive state (i.e., excess energy), the absorbed subtle energy may accumulate within it, potentially leading to imbalances both in its functioning and in the other *chakras*. In both hypoactive and hyperactive states, the affected *chakras*

may exhibit a form of “parasitic” behavior by drawing subtle energy from other *chakras*. Consequently, the flow of subtle energy through the *chakra* system is impaired, resulting in its inadequate distribution throughout the body for cellular vitalization.

The emergence of UNEARs in both physical and mental dimensions may be related to the responsiveness of the physical body and its biological cells to subtle and vital energy mobilized during controlled breathing exercises. After being taken up during inhalation, the vital force (cosmic fluid) circulating through the subtle body must undergo a process of condensation. This process can be facilitated through the use of yogic breathing techniques and may occur during prolonged pauses between inhalation and exhalation (lasting approximately 3 to 6 seconds or longer), thereby promoting what can be termed “spiritual condensation” (Baraduc, 1913). In this way, the subtle energy may be converted into physical energy during controlled breathing exercises to ensure the nourishment of biological cells.

Since all meditation modalities involve breathing exercises, the uptake of subtle energy during breathing is an event that tends to increase the flow of this vital force throughout the body of novice practitioners. In some cases, the practitioner’s subtle body is not yet adapted to the sudden increase in the amount of subtle energy absorbed, and he or she may therefore manifest nuisance reactions in the physical and mental dimensions as a way of signaling that changes are occurring in the subtle body. In other words, the emergence of UNEARs may be a key indicator of a possible imbalance in the functioning of the elements that compose subtle human anatomy, namely the *chakras* and *nadis*.

The “Unearthing Effect” of Meditation

The “unearthing effect” of meditation is a phenomenon in which practitioners dig up their Self shaped by individual life experiences over time and become aware of the various facets of their personality shaped by thoughts continuously generated throughout life. This process appears to be closely linked to the primary aim of ancient meditative practices: self-knowledge and self-transformation.

It is well established that a novel classification system that categorizes specific styles of meditation into attentional, constructive, and deconstructive families was proposed in the literature (Dahl et al., 2015). However, irrespective of the modality, specific meditation practices may function as springboards, enabling practitioners to

jump into and dive deeply into the process of both deconstructing and reconstructing the Self. This process may be triggered even at the early stages of practice, for example, during controlled breathing exercises guided by will and thoughts endowed with intentions.

For some individuals, the remodeling of Self is conflictual and emotionally painful, as meditation works to dig up secrets hidden within the mind that are related to the fragility of the Self. This is an extremely difficult moment because practitioner “opens the drawers of the Ego” and comes across the imperfections having to face them head on. This is an example of a process of acceptance that can be challenging and may constitute one of the reasons for the high dropout rates observed in meditation studies. In fact, high dropout rates have been well documented (Delmonte, 1988; Fincham et al., 2023; Krisanaprakornkit et al., 2006; Nam & Toneatto, 2016). However, the reasons underlying students’ dropout from meditation practices remain fertile ground for further investigations.

The view that meditation consists merely of sitting, closing the eyes, breathing, and contemplating is simplistic and reductive. Meditative practice generally requires prior preparation of the mental system, allowing practitioners to regulate mental processes before engaging in self-knowledge and self-transformation. Firstly, it is essential that individuals comprehend the functioning and the roles of the elements involved in activities of the mental system, such as mental habits and attitudes, mental transmutation of thoughts, and cultivation of noble thoughts aimed at the common good for all.

Knowledge of human mental capacities has long been documented in ancient texts, which emphasize the importance of mental training for restoring and maintaining the harmonious functioning of mental processes (Atkinson, 1902, 1908, 1911, 1912). Such an approach may serve as a strategy to strengthen practitioners’ mental faculties and prepare them for more advanced stages of meditation. It is a valuable starting point to support the development of students’ critical thinking, as well as the intentional sowing and cultivation of seeds such as kindness, compassion, and love, which may contribute to the individual’s process of spiritual development. In this context, the remodeling of the Self may be initiated through the sowing and cultivation of the seeds of love. However, this process requires that practitioners demonstrate humility in accepting the need for change and have the courage to initiate it. Unfortunately, not all practitioners are prepared for this stage, and some may experience shock when they realize that the process of self-transformation depends on the extent to

which they are willing to confront their self, shaped by an individual’s life experiences over time

HYPOTHESIS

It has been hypothesized that the failures during the meditative practices, the adaptive response of the multidimensionality of the Being to meditation, and/or the “unearthing effect” of meditation are inducing factors that may be involved in the etiology of unexpected extemporaneous anomalous reactions (UNEARS).

METHODS

Participants and Ethics

The current study is derived from a larger original study conducted to evaluate the effects of meditation on 32 patients with chronic back pain, aged 24 to 80 years (mean age: 51 years). The original study was approved by the ethics committee of the Faculty of Medicine at the University of Brasília, Brazil, protocol CEP-FM 012/2011 (Fernandes, 2016). However, out of 32 participants, 3 reported in their meditation diaries the emergence of unexpected reactions, here referred to as UNEARS. All three participants were female, with ages ranging from 24 to 33 years (mean age: 29 years). A summary of their sociodemographic and clinical profiles is shown in Table 2.

Qualitative Data Collection Instrument

The detection and identification of UNEARS were based on qualitative data derived from semi-structured meditation diaries. After completing the practices, both in class and at home, participants were instructed to complete a paper-based diary in which they reported their daily meditation-related experiences in their own words.

To identify potential reactions, the practice logs included three open-ended questions:

- *What difficulties related to meditation practices have you experienced?*
- *What pleasant effects related to meditation practices have you experienced?*
- *What unpleasant effects related to meditation practices have you experienced?*

All reactions reported by participants were included in full in the Results section. During the five-week course, participants were also instructed to record the dates and times of their daily practice sessions. In addition, they documented the frequency with which they followed the instructor’s guidance.

Table 2. A Brief Sociodemographic and Clinical Profile of the Participants.

Participants	Age	Education	Occupation	Clinical condition	Medication for pain relief	Previous surgery	Previous experience with meditation or other complementary and alternative practices
ACO	24	Postgraduate	Physiotherapist	Chronic back pain, anxiety, attention difficulties, and allergy	Ibuprofen	No	Relaxation technique and Yoga: 4 years
ALGA	30	Postgraduate	Architect	Chronic back pain, anxiety, attention difficulties, allergy, headache and chronic migraine	Homeopathic, Neosaldine	No	No
GSL	33	Postgraduate	Physical education teacher	Chronic low back pain, and anxiety	Loxonin	No	Acupuncture

Meditation Training

The meditation modality used to develop the hypothesis of inducing factors in the present study is rooted in yogic principles, while incorporating distinct techniques. It is practiced in a static seated position and involves exercises of focusing attention to quiet the mind and attain serenity, and allow practitioners to master their ability to absorb, concentrate, balance, and project *prana*, and to use it toward the recovery and maintenance of their health (Castellar et al., 2014).

Participants in the study underwent a meditation training course consisting of two weekly sessions of 3 hours each. The sessions included an exposition of the theoretical foundations of the method, followed by collective meditation practice. In general, the duration of group meditation sessions ranged from 10 to 20 minutes.

The following topics were discussed during the 5-week training course: (1) What is meditation; (2) The healing power of meditation; (3) Pranic meditation; (4) *Prana and pranayama*; (5) The *chakra* system: anatomy and physiology; (6) The *chakra* system: pathology; (7) Mantra; (8) Obstacles and risks of meditation; (9) Pranic meditation: health and equilibrium; (10) Meditation and transcendence.

Intervention after Detection of UNEARs

After UNEARs were reported, participants were received by the meditation instructor, a professional with clinical practice experience. The instructor provided supportive guidance aimed at helping participants recall circumstances or events in their daily lives that may have generated conflicting thoughts and emotions associated with the emergence of these reactions. The instructor also assessed whether these reactions were recurrent. To determine whether the reactions were related to failures in the execution of meditation practices, the instructor conducted a review of the exercises with the participants.

Based on practitioners' self-reported experiences and the information obtained during the welcoming care, an etiological hypothesis was proposed, supported by the following potential inducing factors underlying a possible cause-and-effect relationship between meditation and UNEARs: (1) failures during the performance of meditative practices, (2) adaptation of the multidimensional body to meditation, and (3) "unearthing effect" of meditation.

RESULTS

The meditation diaries enabled novice practitioners to describe UNEARs occurring during or after meditation practice. Analysis of the diary data showed that three participants exhibited such reactions during the course period: ACO (weeks from 1 to 3); ALGA (weeks from 2 to 4), and GSL (weeks 1, 3, and 4) (see Table 3).

A primary characteristic of UNEARs is their capacity to manifest across all dimensions of the multidimensional body. Data collected in this study indicate that practitioners experienced effects in all three dimensions (see Table 4). After identifying the manifestations of UNEARs, the instructor engaged with the students to mitigate or eliminate the nuisance reactions. Accordingly, two initial strategies were proposed:

First, the instructor collected information regarding circumstances or events that may have occurred in the participant's life prior to joining the meditation course. The aim was to determine whether meditation had acted as a "trigger" for the emergence of UNEARs. In this context, participants provided additional information about concerns related to interpersonal relationships within the family environment, at work, or with friends. They also reported whether their symptoms were new or recurrent. Second, to assess potential errors during meditative practice, the instructor asked participants to repeat the exercises while explaining each step.

Based on the reports of the three practitioners, the instructor proposed specific interventions for each

Table 3. Reports of UNEAR Emergence and Symptom Descriptions Provided by Study Participants.

Participants	Week 1	Week 2	Week 3	Week 4	Week 5	Number of days and minutes practiced during the meditation course
ACO	After meditation: UNEARS: weight on the shoulders; tiredness, and drowsiness. Frequency of practices: 5 times per week Total weekly practice time: 55 min Average daily duration of meditation practices: 11 min	Did not report whether UNEARS occurred during or after meditation. UNEARS: increase in anxiety and aggressiveness. Frequency of practices: 6 times per week Total weekly practice time: 100 min Average daily duration of meditation practices: 17 min	During the meditation: UNEARS: imbued with feelings of anger and jealousy; and feeling indisposed. Frequency of practices: 6 times per week Total weekly practice time: 105 min Average daily duration of meditation practices: 17 min	No UNEARS. Frequency of practices: 7 times per week Total weekly practice time: 133 min Average daily duration of meditation practices: 19 min	Missing data. (*)	Number of days: 24 Total meditation practice time: 368 min Average daily meditation practice duration: 15 min
ALGA	No UNEARS. Frequency of practices: 2 times per week Total weekly practice time: 20 min Average daily duration of meditative practices: 10 min	Did not report whether the UNEARS occurred during or after meditation. UNEARS: increased headache in the forehead area; sudden heat sensations in different areas of the body; fear of consciousness leaving the body; fear of the unknown; anguish; negative feelings; numbness in the feet. Frequency of practices: 6 times per week Total weekly practice time: 131 min Average daily duration of meditative practices: 22 min	Did not report whether the UNEARS occurred during or after meditation. UNEARS: headache in the forehead area; increased salivary secretion; and numbness in the legs and feet. Frequency of practices: 6 times per week Total weekly practice time: 101 min Average daily duration of meditative practices: 17 min	After meditation: UNEARS: slight headache in the forehead area; accumulation and concentration of subtle energy in the forehead area; and numbness in the legs and feet. Frequency of practices: 5 times per week Total weekly practice time: 128 min Average daily duration of meditative practices: 26 min	After meditation: UNEARS: slight headache in the forehead area. Frequency of practices: 2 times per week Total weekly practice time: 48 min Average daily duration of meditative practices: 24 min	Number of days: 21 Total meditation practice time: 358 min Average daily meditation practice duration: 17 min
GSL	Did not report whether the UNEARS occurred during or after meditation. UNEARS: headache Frequency of practices: 4 times per week Total weekly practice time: 76 min Average daily duration of meditative practices: 19 min	Did not report whether the UNEARS occurred during or after meditation. UNEARS: sudden heat sensations in the body; dizziness and feeling faint. Frequency of practices: 6 times per week Total weekly practice time: 105 min Average daily duration of meditation practices: 18 min Note: prior to the meditation class, she underwent infrared and ultrasound physiotherapy.	After meditation: UNEARS: Physical and mental exhaustion. Frequency of practices: 7 times per week Total weekly practice time: 137 min Average daily duration of meditative practices: 20 min	After meditation: UNEARS: crying episodes, a desire to discontinue meditation practice. Frequency of practices: 7 times per week Total weekly practice time: 131 min Average daily duration of meditative practices: 21 min Note: she managed to deal with the interpersonal conflict at work by means of breathing and visualization techniques aimed at quieting the mind.	No UNEARS. Frequency of practices: 4 times per week Total weekly practice time: 84 min Average daily duration of meditative practices: 21 min	Number of days: 28 Total meditation practice time: 533 min Average daily meditation practice duration: 19 min

Note. *Although data were missing in the 5th week, the results showed pain cessation in the 4th week.

Table 4. Dimensions in which the UNEARs were manifested, Etiological Hypotheses, Interventions, and Outcomes.

Participants	UNEARs-affected dimensions			Interventions	Outcomes
	Physical	Mental	Spiritual		
ACO	Shoulder heaviness, tiredness, drowsiness, and feeling indisposed <i>Etiological hypothesis:</i> adaptation of the multidimensional body to meditation.	Increased anxiety <i>Etiological hypothesis:</i> failures in the execution of the exercises causing hyperactivation of the 6th and 7th <i>chakras</i> ; reduced circulation of subtle and vital energy through the seven main <i>chakras</i> ; and/or “unearting effect” of meditation (initial stage of the process of remodeling the Self)	Anger, jealousy, and increased aggressiveness <i>Etiological hypothesis:</i> “unearting effect” of meditation (initial stage of the process of remodeling the Self).	Performing exercises with controlled breathing endowed with intention to release the flow of subtle and vital energy from the 6th and 7th <i>chakras</i> to be redistributed to the other <i>chakras</i> ; exercises aimed at promoting the circulation of subtle and vital energy throughout the seven main <i>chakra</i> system. Aim: to reduce energy accumulation in the 6th and 7th <i>chakras</i> , rebalance the flow of energy throughout the seven main <i>chakra</i> system, and undog the flow of energy throughout the <i>nadis</i> system.	UNEARs ceased in week 4.
ALGA	<u>Headache</u> <i>Etiological hypothesis:</i> failures in the execution of the exercises causing hyperactivation of the 6th <i>chakra</i> ; reduced circulation of subtle and vital energy throughout the seven main <i>chakra</i> system; and/or adaptation of the multidimensional body to meditation. Sudden heat in the body <i>Etiological hypothesis:</i> failures in the execution of the exercises causing hyperactivation of the 5th <i>chakra</i> ; extemporaneous awakening of <i>kundalini</i> energy. Sudden sialorrhea <i>Etiological hypothesis:</i> failures in the execution of the exercises causing hyperactivation of the 5th <i>chakra</i> ; and/or adaptation of the multidimensional body to meditation. Numbness in the legs and left foot <i>Etiological hypothesis:</i> failures in the execution of the exercises causing hyperactivation of the 1st and 2nd <i>chakras</i> . Note: The sitting bodily posture on the chair may have influenced this reaction; however, the participant did not adopt the lotus posture with crossed legs.	Non-specific negative feelings <i>Etiological hypothesis:</i> failures in the execution of the exercises causing hyperactivation of the 7th <i>chakra</i> and hypoactivation of the 6th <i>chakra</i> ; and/or “unearting effect” of meditation (initial stage of the process of remodeling the Self).	<u>Fear of consciousness leaving the body</u> <i>Etiological hypothesis:</i> failures in the execution of the exercises causing hypoactivation of the 7th <i>chakra</i> ; and/or “unearting effect” of meditation (initial stage of the process of remodeling the Self). Anguish <i>Etiological hypothesis:</i> “unearting effect” of meditation (initial stage of the process of remodeling the Self). Sensation of subtle-energy accumulation and concentration in the forehead area <i>Etiological hypothesis:</i> failures in the execution of the exercises causing hyperactivation of the 6th <i>chakra</i> .	Performing exercises with controlled breathing endowed with intention to capture subtle and vital energy to activate the 1st, 2nd, and 7th <i>chakras</i> . Performing exercises with controlled breathing endowed with intention to release the flow of subtle and vital energy from the 6th <i>chakra</i> to be redistributed to the other <i>chakras</i> ; exercises aimed at promoting the circulation of subtle and vital energy throughout the seven main <i>chakra</i> system. Aim: to rebalance the flow of energy throughout the seven main <i>chakra</i> system and unclog the flow of energy throughout the <i>nadis</i> system.	Reduction of headache and cessation of other UNEARs.
GSL	<u>Headache</u> <i>Etiological hypothesis:</i> failures in the execution of the exercises causing hyperactivation of the 6th <i>chakra</i> ; reduced circulation of subtle and vital energy throughout the seven main <i>chakra</i> system; and/or adaptation of the multidimensional body to meditation. Physical exhaustion, dizziness, and feeling faint <i>Etiological hypothesis:</i> adaptation of the multidimensional body to meditation, mainly to the controlled breathing exercises. Note: before the meditation class, the participant underwent physiotherapy with infrared and ultrasound. These three symptoms occurred immediately after practicing meditation; however, they may have been caused by the treatment or simply triggered by the meditation.	Mental exhaustion <i>Etiological hypothesis:</i> failures in the execution of the exercises due to lack of circulation of subtle and vital energy throughout the seven main <i>chakra</i> system; and/or adaptation of the multidimensional body to meditation, mainly to the controlled breathing exercises.	<u>Crying episodes, desire to discontinue meditation practices, and recollections of interpersonal problems brought to mind</u> <i>Etiological hypothesis:</i> “unearting effect” of meditation (initial stage of the process of remodeling the Self).	Performing exercises with controlled breathing endowed with intention to release the flow of subtle and vital energy from the 6th <i>chakra</i> to be redistributed to the other <i>chakras</i> ; exercises aimed at promoting the circulation of subtle and vital energy throughout the seven main <i>chakra</i> system. Aim: to rebalance the flow of energy throughout the seven main <i>chakra</i> system and unclog the flow of energy throughout the <i>nadis</i> system.	UNEARs ceased in week 5.



student. In all three cases, the UNEARs ceased during the meditation course. However, among the UNEARs reported by ALGA, headache was the only symptom that did not completely resolve, showing only partial reduction.

Interestingly, some reactions appeared to be unrelated to errors in exercise execution. Although ACO performed the exercises correctly, she reported UNEARs, including shoulder heaviness, tiredness, drowsiness, and feeling indisposed (see Table 4).

In addition to the UNEARs reported by the three participants in the current study, further reactions were reported by students who attended meditation courses conducted between 2007 and 2013, 2018 and 2019, and from 2024 to the first half of 2026. Examples of UNEARs experienced by novice practitioners include lacrimation, sudden sialorrhea, headaches, sudden heat in the hands, face, and along the spine, itching and tingling sensations throughout the body, as well as irritation, fear, anxiety, depression, and panic (unpublished data). In some cases, these reactions ceased spontaneously; in others, they ceased following intervention by the meditation instructor, who identified the issue during the welcoming care for students.

Conversely, reports of pleasant reactions were also observed, including improvements in attention, concentration, and breathing capacity; reduced pain; altered states of consciousness accompanied by a sense of peace; and the development of altruism (unpublished data).

DISCUSSION

The present study brings up reports of UNEARs manifested across the physical, mental, and spiritual dimensions of novice practitioners who were still engaged in the learning stage of basic exercises. In other words, participants had no detailed prior knowledge of the theoretical framework of the meditation modality used in the present study, nor of the exercises that comprise the meditative practice. Even so, they experienced unexpected reactions during the meditation course.

The meditation described in this study consists of controlled breathing exercises that promote slow abdominothoracic movements and require nasal breathing only. The lungs are less engaged, as the task of inhaling and exhaling is shared with the abdominal region. In general, most novice practitioners are not familiar with this type of breathing, which is characterized by a brief pause between inhalation and exhalation. As a result, many students make errors during practice by inhaling or exhaling too quickly or by failing to observe these pauses. Consequently, it is

common for practitioners to experience adverse reactions during or after the practice.

The capture of subtle energy often occurs during breathing exercises. After inhalation, air imbued with this “energy” is thought to spread throughout the body, permeating cells and organs. In addition, breathing exercises may also activate *chakras*, promoting the unblocking of subtle vital energy flow through the *chakra* system and *nadis*. One consequence of this process is the emergence of itching sensations in the body, as reported by novice practitioners in the meditation courses mentioned earlier in the present study.

Headaches, sialorrhea, lacrimation, heat sensation, and numbness in the legs constitute a group of UNEARs corresponding to the physical dimension of these symptoms. With regard to headaches, this type of UNEAR appears to be a common effect among meditation practitioners. Such reactions have been well documented in the literature, being described as unwanted effects (Cebolla et al., 2017) and adverse events (Farias et al., 2020), suggesting a possible association with the harmful effects of meditation. Reports of frontal headaches and lacrimation are common among novice practitioners, as also observed in the present study. This area of the head corresponds to the region in which the sixth *chakra* is situated within the subtle domain (spiritual), while also being related to the physical body (Greenwood, 2006). With the exception of *chakras* 1 and 7, the sixth *chakra* and the others that compose the seven main *chakra* system have anterior and posterior projections relative to the body (Shang, 2000). This may explain why practitioners sometimes report headaches radiating from the frontal region of the forehead toward the back of the neck.

Failures in performing the exercises and the adaptation of the multidimensionality of Being to meditation are among the possible explanations for the emergence of headaches and lacrimation linked to the sixth *chakra*. Such symptoms may occur due to hyperactivation of this energy center caused by errors performed by inexperienced practitioners. Overall, this may lead to an accumulation of subtle energy within the *chakra*, resulting in a blockage of energetic flow throughout the *chakra* system and *nadis*. The increase in concentration of subtle energy in a particular *chakra* may produce unexpected effects. It has been suggested that the upward movement of *chi* to the head may cause irritation and, in some cases, headaches, and that concentration on the heart *chakra* (fourth *chakra*) may lead to congestion and pain in the chest and cardiac region (Chia, 1983). On the other hand, if this *chakra* is initially in

a hypoactivated state, the uptake of subtle energy during breathing exercises could bring it to a new state of balance and vitality to which the subtle body was not previously habituated—something resembling hormesis, an adaptive response of cells and organisms to moderate (usually intermittent) stress (Mattson, 2008), which, in this context, may be stimulated by meditation. Therefore, UNEARs may arise as part of the natural adaptive process of the multidimensional body to meditation, depending on the initial vitality state of the *chakra* prior to practice.

The manifestation of sialorrhea reported in the present study is a common reaction that may be related to the fifth *chakra*, which, according to Best (2010), is located in the throat region. In the case of sialorrhea, this condition may occur as an adaptive response stimulated by the unblocking of points along the *nadis*, which under normal conditions vitalize the fifth *chakra* through the continuous flow of subtle energy. However, sialorrhea may also be related to errors in the execution of meditative practice, for example, in cases in which this *chakra* has been hyperactivated due to excessive accumulation of subtle energy directed toward it.

It is common for students beginning meditation courses to present with physical and/or mental problems. In many cases, meditation has been reported as a supportive intervention for alleviating clinical conditions such as depression (Loiselle et al., 2023; Mahendru et al., 2021), anxiety (Blum et al., 2021), and pain (Fan et al., 2024). These benefits may be related to the “cleansing” and unblocking of *chakras* and *nadis* promoted by breathing techniques. Within the Chinese tradition, this cleansing process is understood to occur when vital energy (*chi*) begins to circulate more freely through the body. However, this process may also produce temporary nuisance reactions, including belching or diarrhea (Chia, 1983). From this perspective, the multidimensional body—initially considered “sick” or energetically imbalanced—undergoes an adaptive process to accommodate the continuous flow of subtle energy responsible for bodily revitalization. In this context, UNEARs may be expressed through the physical body as signals informing consciousness about recent alterations occurring within the subtle dimensions of the individual’s Being. The purpose of these manifestations is understood as signaling that the functioning of the *chakras* and *nadis*—elements of the subtle body, which belong to the spiritual dimension—is returning to normal conditions.

In addition to occurring during meditation practices, unexpected reactions related to holistic interventions have also been observed in individuals undergoing yoga (Cramer

et al., 2019), acupuncture (Bäumler et al., 2021), and hypnosis (Gruzelier, 2000; Stanley & Burrows, 2001). In line with these considerations, it is conceivable that some of these reactions could be symptoms related to the adaptive response of the multidimensional body to such interventions. Nevertheless, the possibility that nuisance reactions may arise due to negligence, inappropriate therapeutic approaches, or insufficient practitioner experience should not be disregarded.

Heat sensations in the body were among the most frequently reported UNEARs by novice practitioners in the present study. Such sensations have previously been described as extraordinary experiences (Vieten et al., 2018). According to participants’ reports, practitioners experienced sudden episodes of heat throughout the body during meditation. Interestingly, some reports described the sensation as originating in the perineal region (associated with the first *chakra*) and ascending along the spine toward the top of the head, subsequently spreading throughout the face. One possible explanatory framework for this phenomenon is the so-called “*kundalini* awakening”.

The term *kundalini* refers to a concept found in yogic and tantric traditions, often described as an all-encompassing form of consciousness or energy inherent in human beings. According to this framework, *kundalini* may manifest in two forms: an outer form, which is the force that gives rise to the universe and governs all our physiological processes, and an inner form, which is the enlivening force behind spiritual awareness (Woollacott et al., 2021). In traditional interpretations, *kundalini*—a cosmic energy—(Chia, 1983) has also been described as playing a role in the activation of *chakras* (Motoyama, 1981). It creates extra heat in the body when awakened by the practice of *pranayama* (breathing exercise) (Saraswati, 2020). Some practitioners report sudden sensations of heat in specific body regions, particularly in the face and the palms of the hands. These experiences appear to be relatively common during or immediately after meditation practices. Such sensations of heat have been interpreted as potentially related to healing abilities involving the intentional transmission of energy through the hands or at a distance. In fact, sensations of heat in the hands were reported among practitioners of distant healing practices (Dossey, 1994).

Despite the benefits attributed to meditative practices for mental health, the development of anxiety has been identified as a potential example of UNEAR and has been described as an adverse effect (AE) in meditation-related studies (Taylor et al., 2022). The desire to rapidly attain the benefits associated with meditation may also contribute

to the emergence of anxiety, nervousness, and aggressiveness. Such reactions were reported by participants in previous meditation courses, whose testimonies informed the present discussion. In addition, anxiety may emerge among practitioners participating in group meditation settings. In these contexts, anxiety may occur among individuals who have not yet experienced pleasant UNEARs but are exposed to reports of beneficial experiences from their fellow practitioners. When novice practitioners fail to perceive pleasant UNEAR experiences during the initial weeks of meditation, they may begin to perceive themselves as abnormal or different from other participants. Consequently, feelings of frustration and depressive symptoms may emerge. Under such circumstances, practitioners may cultivate a desire to discontinue meditation practice. This phenomenon may become a persistent barrier to continued engagement, and overcoming it depends largely on the practitioner's ability to understand the process of uncovering the true Self and to develop adaptive strategies for coping with these experiences.

In the current study, the etiological hypothesis for the emergence of anxiety may be related to the improper performance of exercises that lead to hyperactivation of the sixth *chakra*. Such hyperactivation appears to be a common error among practitioners without prior meditation experience. In general, this occurs when practitioners become excessively focused on rapidly perceiving the flow of subtle energy through the *chakra* system and throughout the body. When these expectations are not fulfilled, practitioners may develop anxiety resulting from self-generated expectations combined with the desire to achieve the benefits of meditation practice more quickly.

Besides errors in performing the exercises and the adaptation process of the multidimensional body, the "unearthing effect" of meditation may represent another factor associated with the emergence of UNEARs. In the present study, novice practitioners reported reactions including non-specific negative feelings, anguish, crying episodes, a desire to discontinue meditation practice, recollections of interpersonal conflicts, fear of consciousness leaving the body, and fear of the unknown. One possible explanation is that meditation may promote the opening of what could be described as the "closed doors of the Self." This process may occur when the seventh *chakra*, supposedly connected to the spiritual dimension, becomes activated during meditative practice. Such activation may lead to self-sabotaging behavior manifested by some practitioners. In general, this effect has been observed among novice practitioners who tend to avoid exposing their secrets, personal flaws, and

weaknesses. Instead, practitioners choose to bury these aspects in the recesses of the mind. This functions as a defense mechanism to prevent practitioners from directly confronting the Self. From a metaphysical perspective, the Self is shaped by individuals' life experiences over time and may be expressed through personality and character.

Self-sabotaging behavior is an example of the "unearthing effect" of meditation, commonly experienced by novice practitioners. It may also be conceptualized as a form of UNEAR that manifests as a symptom within the spiritual dimension. This reaction has been observed in some novice practitioners and may contribute to the individual's desire to discontinue meditation practice. In the present study, ACO reported feelings of anger, whereas GSL experienced crying episodes and a desire to withdraw from the meditation course. Self-sabotaging behavior may also lead practitioners to develop aversion toward meditation. Such reactions may be triggered in the following ways: when practitioners have difficulty recognizing and accepting the perceived Self as revealed through meditation, or when they construct various psychological barriers that prevent meditation from helping them cope with their physical, mental, and spiritual challenges. In this latter case, self-sabotage may occur among individuals who use meditation as a means of attracting attention from relatives and friends, demonstrating that they are attempting to "overcome" their "illnesses". However, they may not genuinely seek to resolve these disturbances, instead using them as a strategy of victimization to elicit attention from others.

The development of aversion to meditation may also occur when students begin to attribute to meditation the loss of something they consider valuable. In an investigation of the effects of meditation on chronic back pain, there were cases in which practitioners experienced a reduction or even complete elimination of pain following practice (Fernandes, 2016). Interestingly, despite this notable benefit, some practitioners reported that meditation removed their pain—a condition they had come to regard as a constant and inseparable companion—without providing any perceived compensatory gain for this loss.

The fact that meditation promotes the remodeling of the Self suggests that the "unearthing effect" may be directly linked to the practitioner's spiritual dimension. However, UNEAR may also manifest in the mental dimension, as the processes of self-knowledge and self-transformation are often accompanied by internal conflicts. In most cases, such conflicts arise from the difficulties practitioners experience in accepting the changes elicited by meditation.

CONSIDERATIONS REGARDING THE STUDY LIMITATIONS

Although the present study proposes an etiological hypothesis supported by putative inducing factors suggesting a possible cause-and-effect relationship between meditation practices and UNEARs, certain limitations must be acknowledged.

In the last years, the existence of *chakras* within the human body has been explored in a limited number of studies, including investigations addressing the proposed interconnections between *chakras* and the nervous system (Malimas et al., 2023), anatomical approaches attempting to identify putative correlates of *chakras* through cadaveric dissection (Sweta et al., 2017), and theoretical model describing their development during embryogenesis (Acharya et al., 2018). Nevertheless, empirical validation of *chakras* and *nadis* remains constrained by the absence of technological instruments capable of detecting, visualizing, or quantifying their activities. Consequently, current conceptualizations regarding the role of *chakras* in health, disease processes, and human spiritual development remain largely speculative and situated within metaphysical frameworks.

The potential relationship between *chakras* and meridian systems in the context of health and disease has been addressed in the scientific literature (Shang, 2000, 2001). However, these interpretations remain theoretical and lack confirmation through studies conducted with methodological rigor. Similarly, the inducing factors hypothesis proposed in the present study, as well as its possible association with UNEARs, should be interpreted with caution. Therefore, these constructs should be considered as preliminary scientific interpretations that warrant thorough investigation and empirical validation in order to enable, in the future, the establishment of causal relationships between *chakra*-related mechanisms and physiological outcomes in both the physical and mental domains.

In this study, the hypothesis concerning inducing factors is partially associated with the positive outcomes of the intervention strategies conducted by an instructor with substantial knowledge of the *chakra* system. Nevertheless, it remains unclear whether these strategies would demonstrate similar effectiveness among practitioners of other meditation modalities that do not incorporate exercises focused on *chakra* activation and/or the intentional direction of subtle and vital energy (*prana*) throughout the body. Despite these limitations, controlled breathing exercises, which are common to most meditation practices, may naturally facilitate the absorption and circulation of subtle and

vital energy through the *chakras*, thereby activating these energetic centers in a constitutive manner. Such activation may contribute to a broad spectrum of physiological, psychological, and spiritual reactions related to the adaptation of the multidimensionality of the Being to meditation.

Empirical observations obtained from students enrolled in previous courses of the present meditation modality suggest that balanced *chakra* activation may be facilitated through controlled breathing exercises combined with thoughts endowed with positive intentions. These practices have been reported as effective in reducing, or even eliminating, unpleasant-type UNEARs. Another intervention strategy involves a mental approach aimed at encouraging students to understand that some of these reactions are part of the process of accepting the imperfections of the Self. This interpretation is consistent with the statement made by Chaturvedi et al. (2015), who claimed that *"the positive flow of thoughts is based on an accurate understanding of the self and so it acts as a key to unlock the treasure trove of peaceful experiences which are lying within oneself."*

Based on unexpected reactions reported by novice practitioners, this qualitative study proposes the existence of inducing factors acting as "triggers" of UNEARs. Although the present article primarily provides a reasoned argument supported by case-report evidence, future studies involving larger sample sizes, standardized questionnaires, and appropriate analytical approaches may enable more rigorous testing and further consolidation of the hypothesis proposed herein.

CONCLUSION

This study took into account a small sample comprising three practitioners with a history of clinical complications. Considering both the empirical observations derived from participants in previous meditation courses and the broad range of unusual meditation-related experiences described in the scientific literature, an important question arises: why did the remaining 29 practitioners with chronic back pain and symptoms of depression and anxiety not manifest UNEARs during or after meditation practice? Notably, these participants were undergoing conventional pharmacological treatment for depression and anxiety while also using anti-inflammatory medications.

In the current study, the three students were the only participants who reported UNEARs, and it was possible to identify that each of them made procedural mistakes during the meditation practices. However, reactions were also observed in the absence of errors during the execution of

the meditative exercises: ACO experienced UNEARs in the physical and spiritual dimensions, whereas GSL reported UNEARs manifested in the spiritual dimension. In light of these findings, how can an appropriate etiological hypothesis be established for each case? Furthermore, how can an intervention be proposed that is capable of reducing or eliminating such unexpected experiences?

Empirical observations suggest that UNEARs constitute an unpredictable phenomenon. They may manifest in novice practitioners as well as in individuals with prior meditation experience; they may occur within only a few minutes of practice; and they may affect students across different ages, genders, colors, social statuses, and cultural backgrounds. Additionally, UNEARs may be reported both by practitioners with religious beliefs and by those with atheistic or skeptical worldviews, and they appear to arise independently of prior clinical history or medical conditions. Furthermore, evidence from previous studies on meditation-related experiences indicates that a range of reactions potentially related to meditation may occur regardless of the meditation modality employed.

In this context, it is reasonable to propose that the systematic study of UNEARs and their etiological hypotheses may be better understood if these reactions are initially categorized according to the affected dimension of the practitioner (i.e., physical, mental, and spiritual). To this end, the following procedures are recommended: (1) the reaction should be carefully observed and described in detail; (2) the affected dimension in which the reaction manifests should be identified; and (3) relevant information regarding the student's clinical history and personal life experiences should be collected. Subsequently, a specific intervention should be proposed based on the analyzed data. These procedures should be conducted by an experienced meditation instructor with competencies that facilitate a supportive and structured interface during the welcoming care.

The active involvement of an instructor during the welcoming process is essential. The presence of an experienced meditation instructor capable of supporting practitioners and assisting them with any doubts or difficulties that may arise during the practices is highly relevant. It is possible that some of the adverse events and reactions reported in the literature occurred because practitioners were not adequately supported during meditation sessions, resulting in uncorrected errors during the exercises and insufficient guidance in dealing with aspects of the Self that emerged throughout the practice.

One issue that deserves particular attention concerns the possible association between UNEARs and the dropout of novice practitioners from meditation programs. Many individuals seek meditation as an alternative means of resolving a wide range of problems, including health-related, emotional, and financial difficulties. However, such individuals often do not fully understand the fundamental principles underlying meditation practice and may develop unrealistic expectations regarding the rapid attainment of its benefits. Consequently, when they realize that their problems persist despite engaging in meditation, feelings of frustration, anxiety, nervousness, and other adverse emotional reactions may emerge. In this context, novice practitioners may gradually develop the desire to discontinue meditation practice.

Unfortunately, meditation has long been portrayed as a "miracle pill" capable of curing diseases and solving all life's problems. Such a perspective represents a serious misconception that may undermine the credibility of an ancient tool whose primary purpose lies in the cultivation of self-knowledge and self-transformation.

To prevent the emergence of UNEARs, meditation courses should incorporate both theoretical and practical frameworks addressing the benefits as well as the potential risks associated with meditation practice. Structured educational content should be developed, including detailed descriptions of the exercises and appropriate warnings regarding possible unexpected reactions related to meditation. Such materials should also provide descriptions of techniques capable of reducing or alleviating the most common UNEARs reported by practitioners.

Meditation instructors should develop "Meditation Information Leaflets" (MILs) for novice practitioners; however, careful consideration should be given to how such information is conveyed. Prior disclosure of unusual meditation-related experiences may inadvertently elicit UNEARs through self-induction or expectancy-related mechanisms, possibly linked to the nocebo effect.

Another strategy that may help prevent UNEARs across different meditation modalities concerns the pedagogical approach adopted in meditation classes. Both the theoretical and practical frameworks should be well-grounded, clearly explained, and designed to maximize students' understanding of meditation principles and techniques. Furthermore, the topics addressed during theoretical instruction should preferably be related to the meditation practices performed on the same day of the class.

Still, regarding the prevention of UNEARs and the improvement of meditative practices, it is recommended that novice practitioners initially undergo prior mental preparation through basic breathing exercises guided by intentional thoughts and volitional control aimed at promoting the harmonious functioning of mental activities. Additionally, during the first weeks of practice, novice practitioners should avoid highly complex exercises, particularly those involving the deconstruction and reconstruction of the Self or practices capable of inducing meditative states characterized by altered states of consciousness. With respect to nighttime meditation, practices should be limited to basic breathing exercises intended to calm the mind, relax the body, and promote inner peace. In this context, meditation training is recommended to follow standardized learning stages, including: (I) breathing exercises designed to adapt the body to new breathing patterns; (II) attention and concentration exercises aimed at training and disciplining the mind; and (III) breathing practices associated with thoughts endowed with specific intentionality directed toward achieving mental balance.

The inclusion of practitioners in more advanced lessons and meditation practices should occur gradually, always taking into consideration the time required for each individual to develop mental balance and to understand the deeper meaning and purpose of meditation practice.

Authors have used principles from neuroscience and psychology to explain the broad range of unusual reactions reported by meditators. Nevertheless, the underlying problem may extend beyond the conventional approaches commonly employed to assess clinical conditions and biological variables. The investigation of the potential causes of meditation-related symptoms may benefit from approaches grounded in the understanding of the subtle anatomy of the Being, as well as from examining the difficulties practitioners experience when confronting their Self.

A wide variety of terms have been identified in previous studies to describe the unusual meditation-related experiences referred to here as UNEARs. This phenomenon should not be interpreted or judged as a devastating avalanche attributable solely to meditation.

IMPLICATIONS AND APPLICATIONS

The present study proposes the conception of UNEARs as a phenomenon that may occur both in novice practitioners and in experienced meditators. The inducing factors described herein may contribute to future investigations aimed at understanding why such reactions do not

manifest in all meditation practitioners. Additionally, the emergence of UNEARs reported in other alternative practices, such as yoga, acupuncture, and hypnosis, reinforces the relevance of achieving a deeper understanding of the subtle anatomy of the Being and its relationship with the health–disease binomial. The “unearthing effect” of meditation provides clues about the *modus operandi* of the mind and opens new doors for future investigations examining how meditation influences the mental system and contributes to processes of self-remodeling and the redesigning of personality and character in individuals.

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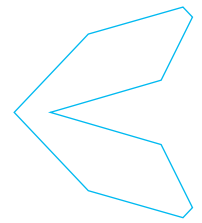
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RESEARCH
ARTICLE

Citizen Orb Photometry Pipeline (COPP): A Standardized Method for Computational Analysis of Anomalous Luminous Phenomena from Consumer Video Captures

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ABSTRACT

We present the Citizen Orb Photometry Pipeline (COPP), a standardized ten-step computational method for quantitative analysis of anomalous luminous phenomena (ALP) captured in consumer video recordings. The pipeline extracts frame-by-frame photometric measurements including centroid position, apparent size, peak and integrated intensity, RGB spectral channel decomposition, and derived metrics including blue excess, pulsation periodicity, and position discontinuities. A key methodological innovation is adaptive spectral measurement: when sensor saturation renders core color data unreliable, the pipeline automatically shifts spectral analysis to the unsaturated halo region, enabling consistent cross-case comparison regardless of source brightness or observer distance. We demonstrate COPP through comparative analysis of three ALP captures spanning fourteen years, three countries, and distinct observational conditions: a distant, mobile, spectrally cool orb over the Taiwan coast (2021); a close-range, stationary, spectrally warm orb in the United Kingdom (2011); and a close-range, stationary orb with correlated size-color pulsation in Poland (2025). Despite differences in apparent brightness, angular size, and sensor saturation state, all three cases exhibit spectral overlap consistent with a common emission mechanism. Signal structure analysis of the Taiwan case reveals strong size-intensity correlation ($r = 0.808$) and quasi-periodic pulsation, indicating non-random temporal structure. COPP addresses a documented gap between professionally calibrated instruments and citizen capture platforms by providing a standardized computational bridge that runs in standard Python environments and processes any consumer video format. The COPP v1.0 pipeline demo is available as a working prototype at <https://copp-w.vercel.app/>. The purpose of this paper is to place the method and its outputs in the public domain in a form others can inspect, critique and extend, and we invite the community to test the pipeline against their own captures and to help make it more reliable and more consistent.

KEYWORDS

Anomalous luminous phenomena, citizen science, photometry, computational analysis, orb, Hessdalen, plasma, spectral analysis, signal processing, UAP.

Anomalous luminous phenomena (ALP) have been documented across diverse geographic and cultural contexts for centuries, yet remain poorly characterized by mainstream science. Among the most systematically studied instances are the Hessdalen lights of central Norway, where persistent luminous phenomena have been observed since the 1980s and subjected to rigorous instrumental investigation (Strand, 1984; Teodorani, 2004; Hauge, 2010). These investigations have established key physical parameters: radiant powers reaching 19 kW, thermal spectra in the visible range, quasi-periodic intensity modulation, and anomalous kinematic behavior including sudden acceleration and position discontinuities (Teodorani, 2004).

Despite this professional work, a fundamental asymmetry persists in the field. Instrumental monitoring stations such as the Hessdalen Automatic Measurement Station (AMS) and calibrated spectrographic equipment are restricted to fixed locations and require significant technical expertise and financial investment. Meanwhile, the vast majority of ALP observations worldwide are captured on consumer devices (smartphones, dashcams, security cameras) by untrained observers who lack tools to extract quantitative information from their recordings. As Morgan and Tyson (2024) note in their analysis of Australian orb phenomena, photometric equipment remains a critical missing component in field investigation protocols.

Several citizen science platforms address portions of this gap. Project Hessdalen maintains a public archive of automated station captures dating to 1998. Sky360 operates an open-source detection network for automated sky monitoring. NASA's Spritacular project crowdsources observations of transient luminous events. However, none of these platforms provide an automated, standardized tool for citizens to perform quantitative photometric analysis of their own video recordings after capture.

This paper presents the Citizen Orb Photometry Pipeline (COPP), a ten-step computational method designed to fill this gap. COPP processes any consumer video recording containing a luminous anomaly and produces standardized photometric measurements suitable for scientific comparison. We illustrate the pipeline through comparative analysis of three independent ALP captures, demonstrating both the method's behavior across diverse observational conditions and the scientific value of the data it extracts.

RELATED WORK

Professional ALP Investigation

The Hessdalen phenomenon represents the gold standard for systematic ALP investigation. Teodorani (2004) conducted calibrated spectroscopic and photometric measurements over multiple field campaigns, establishing that the Hessdalen lights exhibit thermal spectra with temperatures in the range of 6000–9000 K, radiant powers of 19 kW or more, and spectral characteristics consistent with high-temperature plasma. Hauge (2010) described the design and operation of the Hessdalen AMS, an automated monitoring station employing calibrated cameras, magnetometers, and radar, operational since 1998 and archiving observations on a continuous basis. Knuth et al. (2025) extended this work in a multi-author analysis of UAP propulsion characteristics, with Teodorani as co-author, integrating kinematic analysis with spectral data.

In Australia, Morgan and Tyson (2024) documented orb phenomena using multi-instrument field recordings, finding correlations between orb orientation and electromagnetic field buildup, and explicitly calling for standardized photometric measurement protocols. Paiva (2021) proposed an electrically active inversion layer model for Hessdalen-type phenomena, suggesting atmospheric electrical processes as a generation mechanism.

Barbi (2025) demonstrated the application of classical mechanics analysis to video recordings of a luminous object interacting with a missile over Yemen, showing that frame-by-frame analysis of consumer-grade footage can yield physically meaningful kinematic parameters.

Citizen Science Platforms

Existing citizen science platforms for ALP observation fall into three categories: automated detection (Sky360, NASA Spritacular), archival and cataloging (Project Hessdalen, NUFORC, MUFON, GEIPAN), and manual forensic analysis (individual investigators and media analysts). An emerging fourth category involves systematic high-volume capture with consumer-grade enhanced sensors such as night-vision cameras. None of these provide automated post-capture photometric analysis tools for citizen use.

The Gap

The gap COPP addresses is specific and well-defined: it lies between professional calibrated instruments (which



produce high-quality data but are geographically and financially restricted) and citizen capture platforms (which collect vast quantities of recordings but lack quantitative analysis capabilities). COPP provides a standardized computational bridge, enabling any citizen with a video recording and a Python environment to extract photometric measurements in the same format used by professional researchers.

METHOD: THE CITIZEN ORB PHOTOMETRY PIPELINE

The Citizen Orb Photometry Pipeline COPP is implemented as a Python module using standard scientific computing libraries (NumPy, SciPy, Matplotlib, Pillow). The pipeline processes consumer video recordings through ten sequential steps, producing per-frame photometric measurements and derived temporal metrics. The method is designed to handle the two principal challenges of citizen ALP video analysis: variable video formats and quality, and the wide range of source brightness from sub-threshold faint to sensor-saturating bright. In the pre-loop phase, which executes once per video, the pipeline extracts all frames and detects the active content region. A per-frame loop then applies adaptive brightness thresholding calibrated to each frame's scene darkness, groups threshold-exceeding pixels into connected clusters, identifies the primary luminous source, and—when a source is detected—computes morphometric, intensity, and adaptive spectral measurements, appending results to a running data structure before advancing to the next frame. Frames in which no source meets the detection criteria are recorded as non-detections and bypass Steps 6 through 8. Once all frames have been processed, the post-loop phase computes derived temporal metrics—including FFT power spectrum estimation, autocorrelation, Runs test non-randomness testing, size-intensity cross-correlations, and burst episode detection—operating on the full assembled time series rather than individual frames. The pipeline concludes by aggregating all measurements into three standardized outputs: a per-frame CSV data table, a photometric dashboard, and a signal structure analysis dashboard. The complete pipeline workflow is presented in Figure 1 using ISO 5807 flowchart notation.

The steps in the pipeline are described in detail in Steps 1 through 10 below.

Step 1: Frame Extraction

Video files are decoded to individual PNG frames using FFMpeg at a configurable target frame rate (default: variable frame rate preservation). This step normalizes across container formats (MP4, WebM, AVI, MOV) and codecs (H.264, VP8, VP9), accepting any consumer video source.

Step 2: Content Region Detection

Many citizen video sources are screen recordings of original captures, or include video player UI overlays, borders, or other non-content elements. COPP automatically detects the content region by analyzing row and column mean brightness profiles. Bright UI elements (toolbars, player controls, window borders) produce characteristic high-brightness bands at frame edges, while the actual video content (typically a dark sky scene) occupies the interior. The content region is defined as the largest contiguous rectangle with mean brightness below an adaptive threshold. A sanity check ensures the detected region comprises at least 30% of the total frame area; if not, the full frame is used.

Step 3: Adaptive Brightness Thresholding

A critical innovation in COPP is the three-tier adaptive threshold for source detection, calibrated to the background brightness of each frame. For ultra-dark scenes [median brightness < 5 digital number (DN), the raw 8-bit pixel value in each channel], such as nighttime ocean or sky observations, the threshold is set at median + 15 DN (minimum 15 DN), providing sensitivity to faint sources. For dark scenes (median 5–30 DN), the threshold is median + 25 DN (minimum 30 DN). For normal scenes (median > 30 DN), the threshold is median + 40 DN (minimum 50 DN). This tiered approach ensures that the same pipeline code detects both faint distant sources (such as the Taiwan case, where peaked at 255 DN in a single channel against a background of 1 DN) and bright nearby sources (such as the UK and Poland cases, where sources saturated the sensor at 255 DN per channel).

Step 4: Connected-Component Labeling

Pixels exceeding the adaptive threshold are grouped into spatially connected clusters using SciPy's ndimage label function with default 4-connectivity. This identifies discrete luminous sources within the frame, distinguishing the primary ALP source from background stars, reflections, or noise clusters.

Citizen Orb Photometry Pipeline (COPP) v1.0 — workflow

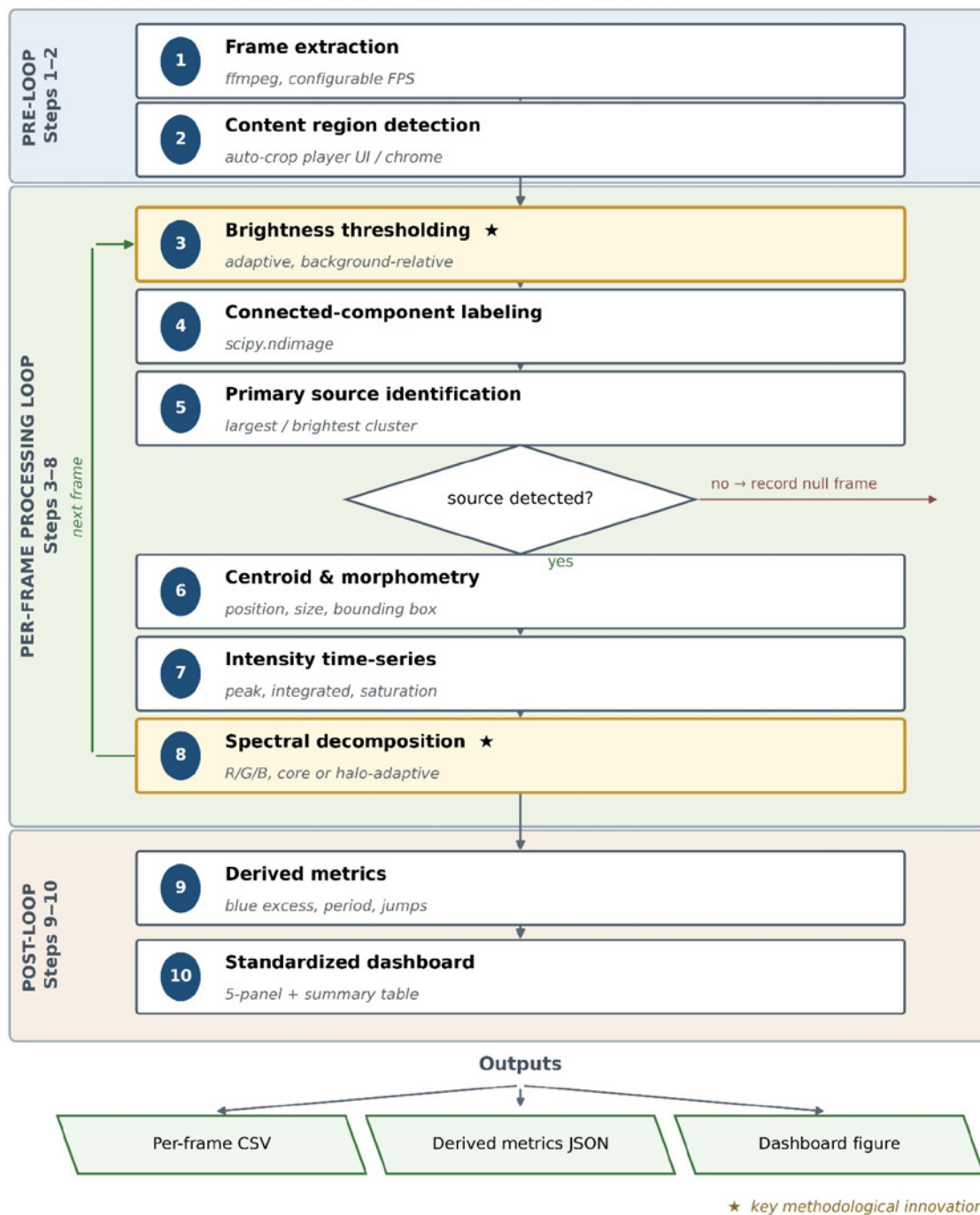


Figure 1. COPP v1.0 Pipeline Workflow in ISO 5807 Flowchart Notation, Showing the Pre-loop Phase (Steps 1–2), Per-frame Processing Loop (Steps 3–8) with Adaptive Source Detection Decision Point, and Post-loop Temporal Analysis and Output Generation (Steps 9–10). Legend identifies symbol types: rounded rectangles (start/end), rectangles (process), diamonds (decision), parallelograms (input/output), and starred items (key innovations).

Step 5: Primary Source Identification

The primary ALP source is identified as the largest connected component whose peak brightness exceeds 1.3 times the adaptive threshold. The size

criterion selects the dominant luminous feature; the peak brightness criterion rejects diffuse background features that may exceed the threshold over large areas but lack the concentrated brightness characteristic of ALP sources.

Step 6: Morphometry

For the identified primary source, COPP computes brightness-weighted centroid coordinates (providing sub-pixel positional accuracy proportional to signal-to-noise ratio), total pixel count (apparent size), and bounding box dimensions (horizontal and vertical extent). The brightness-weighted centroid is more robust to asymmetric halo structures than a geometric centroid.

Step 7: Intensity Measurements

Three intensity metrics are computed per frame: peak intensity (maximum R+G+B sum of any single pixel in the source), integrated intensity (sum of R+G+B across all source pixels), and saturation fraction (proportion of source pixels where any single channel exceeds 250 DN). The saturation fraction is the gating parameter for the adaptive spectral measurement in Step 8.

Step 8: Adaptive Spectral Channel Decomposition

This is the central methodological innovation of COPP. Consumer cameras record in three broadband channels (Red, Green, Blue) spanning approximately 600–700 nm, 500–580 nm, and 420–500 nm, respectively. While these channels lack the spectral resolution of diffraction grating spectrometers, they provide coarse constraints on the dominant spectral character of luminous sources within a single capture session.

Calibration Limitations

It is essential to state clearly what consumer RGB photometry can and cannot establish. COPP operates on in-camera processed sRGB data, not linearized RAW sensor values. The camera imaging pipeline applies auto-exposure, auto-white-balance, gamma correction (typically sRGB gamma approximately 2.2), tone mapping, demosaicing, and lossy compression before producing the frames COPP analyzes. These transformations are nonlinear, device-specific, and generally irreversible without access to RAW data. Consequently, per-pixel DN values are not physically calibrated intensity measurements, and RGB channel ratios are not stable spectral proxies across different cameras, exposure settings, or white-balance states. COPP's spectral metrics (channel means, blue excess) should be interpreted as relative indicators within a single capture session, not as absolute physical measurements

comparable across devices. The spectral classifications reported in this paper (cool/ionized vs warm/thermal) are indicative rather than definitive and should be validated against calibrated spectrometric measurements before physical conclusions are drawn. Future versions of the pipeline should incorporate RAW linearization where available, inverse gamma correction, camera spectral sensitivity (CSS) estimation, and normalized chromaticity coordinates (e.g., (B minus R) divided by (R+G+B), or CIE xy) to reduce exposure and device dependence.

The challenge is that bright ALP sources frequently saturate the sensor, driving all three channels to their maximum value (255 DN for 8-bit encoding) and destroying spectral information in the source core. COPP addresses this through adaptive measurement region selection. When the saturation fraction is below 0.3 (fewer than three in ten source pixels are saturated), spectral channels are measured as the mean R, G, and B values across all source pixels (core measurement). When the saturation fraction equals or exceeds 0.3, spectral channels are measured from the unsaturated halo region: pixels belonging to the source cluster that are in the brightness range 30–200 DN and are not individually saturated (halo measurement). This approach recovers spectral information that would otherwise be lost to saturation, and critically, enables cross-case comparison between saturated and unsaturated captures of the same phenomenon class. However, halo-derived spectra may be contaminated by optical point-spread function (PSF) wings, chromatic aberration, lens flare, and demosaicing artifacts. Characterizing these optical contributions on control targets (e.g., bright stars or point lights captured by the same device) is an important validation step for future work.

COPP reports two spectral metrics per frame. The blue excess in absolute DN (B minus R) provides a within-capture indicator of relative spectral shift. The normalized blue excess ((B minus R) divided by (R+G+B)) provides a ratio metric that is more robust to exposure variation and more comparable across captures, though still subject to the camera pipeline caveats noted above.

Step 9: Derived Temporal Metrics

From the per-frame time series, COPP computes several derived metrics. Position drift is the total range of centroid displacement in X and Y. Position jumps are frame-to-frame centroid displacements exceeding 30 pixels. Intensity variation is the ratio of maximum to minimum peak intensity. Pulsation analysis includes FFT-based power spectrum

estimation and local maximum detection for quasi-period identification. Cross-correlations between size, intensity, blue excess, and position are computed to identify coupled physical behaviors. A Runs test (Wald–Wolfowitz) on the intensity time series quantifies whether bright and dim episodes cluster non-randomly. Burst episodes are identified as contiguous segments exceeding the mean plus 0.5 standard deviations of peak intensity.

Temporal and Kinematic Caveats

In the current implementation, time-domain analyses (FFT, autocorrelation, Runs test) operate on frame indices rather than true timestamps. For constant-framerate (CFR) video, frame indices are proportional to elapsed time, and periodicities can be converted to seconds by dividing by the known frame rate. For variable-framerate (VFR) video, frame indices introduce non-uniform temporal sampling, and analyses should properly use true timestamps with resampling to uniform time or methods designed for unevenly sampled data, such as Lomb-Scargle periodograms (Lomb, 1976; Scargle, 1982) or singular spectrum analysis. The current results report periodicities in frames; conversion to seconds requires confirmation of uniform temporal sampling, which we do not verify in this version. Additionally, position drift and position jumps reflect apparent motion in the image plane, which combines true source motion with camera motion (handheld shake, pan, jitter). The current pipeline does not perform camera motion compensation via background feature registration. Kinematic inferences (drift, jumps, non-ballistic motion) should therefore be interpreted cautiously, particularly for handheld captures, and validated by future implementations incorporating global motion stabilization. Auto-exposure and auto-white-balance adjustments by the camera firmware can also produce quasi-periodic intensity and color variations unrelated to the source; distinguishing these from genuine source pulsation requires either locked exposure settings or statistical separation of camera-induced and source-induced variation.

Step 10: Standardized Output

COPP produces three standardized outputs for each analyzed video, described in Table 1. The identical output format across all cases enables direct visual and quantitative comparison.

DEMONSTRATION: THREE-CASE COMPARATIVE ANALYSIS

We demonstrate COPP through application to three independent ALP video captures selected to span a range of observational conditions: source distance (near and far), sensor saturation state (saturated and unsaturated), geographic location (East Asia, Western Europe, Central Europe), and capture year (2011, 2021, 2025). This comparative analysis is intended as an illustrative demonstration of the method's behavior and outputs; it does not constitute formal validation in the statistical sense. True formal validation—including negative controls, synthetic positive controls, sensitivity analysis, and comparison against calibrated instruments—is identified as future work below.

Case 1: Taiwan Coast, March 28, 2021

A self-luminous orb was observed hovering over the ocean from a coastal location in Taiwan at night. The observer (the author) recorded the phenomenon on a mobile phone until the battery was exhausted. The video was preserved as a screen recording of the original capture. The orb appeared as a small, bright point source against a very dark background (median background brightness: 1 DN), allowing direct core spectral measurement without saturation (saturation fraction: 0.00).

COPP detected the orb in 178 of 246 extracted frames. Full per-frame results are shown in Figure 2. Key findings: apparent size ranged from 3 to 57 pixels with a mean of 23 pixels; peak intensity ranged from 66 to 764 DN (11.6-fold variation); blue excess was $+3.7 \pm 4.3$ DN (cool, blue-shifted emission); position drift was 275 by 225 pixels with

Table 1. COPP Standardized Output Specification.

Output	Contents	Description
Per-frame data table (CSV)	Frame, time, centroid X/Y, size, extent X/Y, peak intensity, integrated intensity, saturation fraction, R/G/B channels, blue excess, spectral source	One row per frame. All Step 6-8 measurements. Machine-readable for statistical analysis.
Photometric dashboard (PNG)	Panel 1: Trajectory. Panel 2: Peak intensity. Panel 3: Spectral channels (R, G, B). Panel 4: Blue excess (B-R). Panel 5: Apparent size. Panel 6: Summary metrics.	Six-panel visualization of per-frame measurements. Identical layout for every case.
Signal structure dashboard (PNG)	Panel 1: Intensity with burst overlay. Panel 2: Autocorrelation function. Panel 3: FFT power spectrum. Panel 4: Size-intensity scatter. Panel 5: Inter-burst gap distribution. Panel 6: Statistical summary.	Six-panel visualization of Step 9 derived temporal metrics. Tests whether the intensity pattern is random or structured.

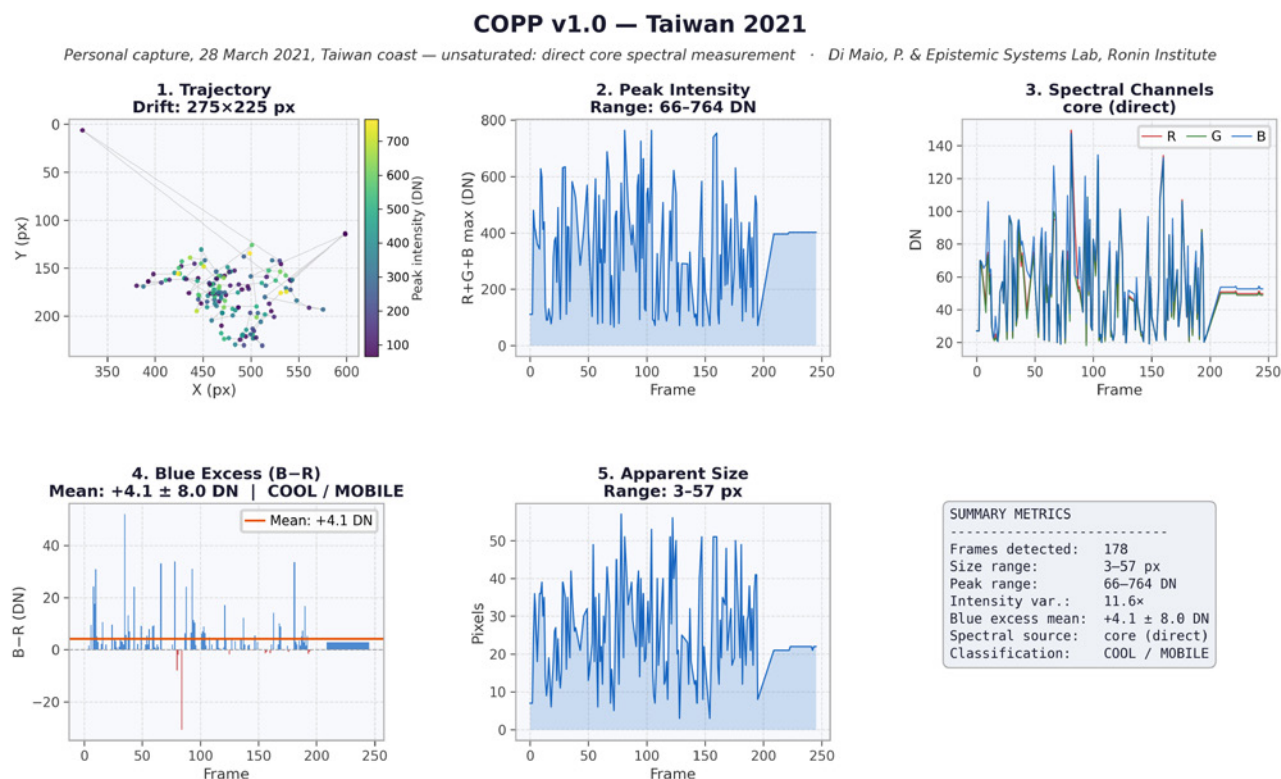


Figure 2. COPP Photometric Analysis: Taiwan Coast, March 28, 2021. Six panels showing: (1) centroid trajectory across the frame, colored by peak intensity—the orb drifted 275×225 pixels with 14 sudden position jumps; (2) peak intensity time series showing high variability (66–764 DN, $11.6\times$ range) indicating genuine pulsation; (3) spectral channels R, G, B measured directly from the unsaturated source core; (4) blue excess (B minus R) with positive mean ($+3.7$ DN) indicating cool, blue-shifted emission; (5) apparent size varying 3–57 pixels, correlated with intensity; (6) summary metrics. Source: personal capture, unsaturated—spectral measurement from core (direct).

14 position jumps exceeding 30 pixels; and size-intensity correlation was $r = 0.808$. FFT analysis revealed dominant periods at 2.4, 7.1, and 8.5 frames.

Case 2: United Kingdom, 2011

A luminous orb was recorded at close range and posted to YouTube (identifier: XFhsCvBSMfw). The source was sufficiently bright to saturate the camera sensor across a large portion of the frame (saturation fraction: 0.32), requiring halo-based spectral measurement.

COPP detected the orb in all 71 frames. Full per-frame results are shown in Figure 3. Key findings: apparent size ranged from 143,485 to 328,369 pixels (sensor-saturating); peak intensity was constant at 765 DN (the sensor ceiling); blue excess measured from the halo was -75.3 plus or minus 3.4 DN (warm, amber-shifted emission); position drift was less than 5 pixels (stationary); the orb exhibited a sudden size expansion in the final frames, with saturated core area doubling between consecutive frames. Signal

structure analysis was inconclusive due to the flat-topped intensity profile imposed by sensor saturation.

Case 3: Poland, 2025

A luminous orb was recorded at close range and posted to YouTube (identifier: Oe2olG9i3i8). Like the UK case, the source saturated the sensor (saturation fraction: 0.35), requiring halo-based spectral measurement.

COPP detected the orb in all 71 frames (66 frames of primary segment plus 5 frames of a distinct secondary segment). Full per-frame results are shown in Figure 4. Key findings for the primary segment: apparent size ranged from 67,154 to 74,303 pixels; blue excess was -77.1 plus or minus 3.7 DN (warm, amber-shifted); position drift was less than 5 pixels (stationary). A mid-video pulse was detected in which apparent size increased 4.8% simultaneously with blue excess shifting from -75 to -85 DN (warmer), demonstrating correlated size-color modulation.

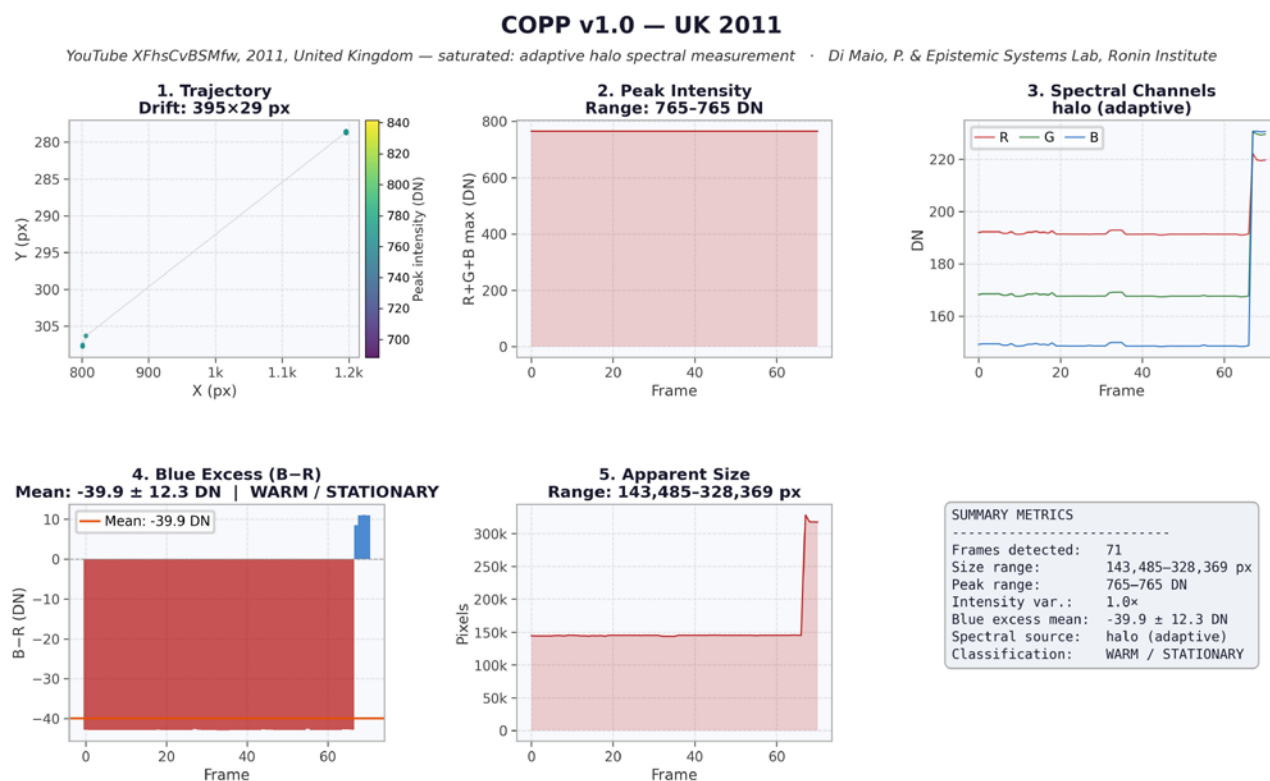


Figure 3. COPP Photometric Analysis: United Kingdom, 2011. Six panels showing: (1) centroid trajectory—the orb remained stationary throughout (drift less than 5 pixels, zero position jumps); (2) peak intensity flat at the sensor ceiling of 765 DN throughout, indicating sensor saturation; (3) spectral channels R, G, B measured from the unsaturated halo region surrounding the saturated core (adaptive halo measurement); (4) blue excess (B minus R) with negative mean indicating warm, amber-shifted emission from the halo; (5) apparent size showing a sudden expansion event in the final frames, with saturated core area doubling; (6) summary metrics. Source: YouTube XFhsCvBSMfw, sensor saturated—spectral measurement from halo (adaptive).

RESULTS

Table 2 summarizes the principal quantitative results across all three cases, organized by measurement category.

Spectral Consistency Across Cases

The most significant finding of the comparative analysis, presented side by side in Figure 6, is spectral consistency across all three cases despite dramatic differences in observational conditions. The Taiwan orb, measured directly from the unsaturated core, shows mean RGB values of (51.9, 51.1, 56.1) DN, giving a slight blue excess. The UK and Poland orbs, measured from the unsaturated halo surrounding the saturated core, show mean RGB values of approximately (183, 155, 107) and (182, 155, 107) DN, respectively. While the absolute brightness values and the channel ordering differ between the core-measured and halo-measured cases, all three sources exhibit measurable emission across the full visible range, with channel-dependent intensity patterns

indicative of broadband emission rather than narrow-line emission from a single atomic species. The property shared across cases is broadband character rather than channel ordering; the difference in ordering is addressed below. Given the calibration limitations discussed in the Calibration Limitations section, this spectral overlap is suggestive of a common emission mechanism but cannot be considered definitive without calibrated spectrometric confirmation. The consistency is nonetheless notable given that the three captures were made by different cameras in different countries over a fourteen-year span.

The apparent difference in blue excess between the Taiwan case (+3.7 DN) and the UK/Poland cases (-75 to -77 DN) may be attributable to several factors: the different measurement regions (core vs. halo), atmospheric Rayleigh scattering over longer optical paths, different camera white-balance settings, or genuine physical differences in emission temperature. Disentangling these contributions requires either calibrated instruments or RAW camera data

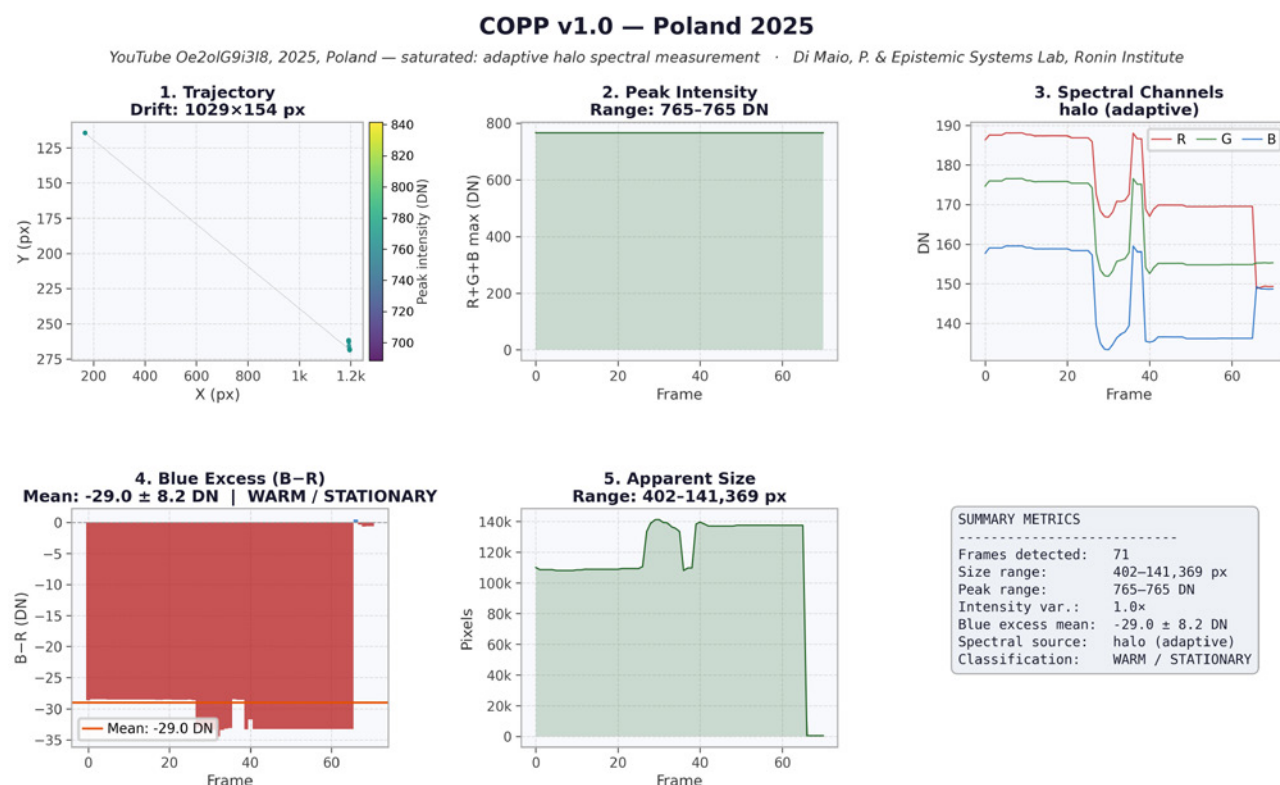


Figure 4. COPP Photometric Analysis: Poland, 2025. Six panels showing: (1) centroid trajectory—the orb remained stationary throughout (drift less than 5 pixels, zero position jumps); (2) peak intensity flat at the sensor ceiling of 765 DN, indicating sensor saturation throughout; (3) spectral channels R, G, B measured from the unsaturated halo region surrounding the saturated core (adaptive halo measurement); (4) blue excess (B minus R) with negative mean indicating warm, amber-shifted emission, with a mid-video pulse where the blue excess shifts to approximately -85 DN (warmer); (5) apparent size showing the correlated size pulse—apparent size increased 4.8% simultaneously with the color shift, demonstrating coupled size-color modulation; (6) summary metrics. Source: YouTube Oe2olG9i3l8, sensor saturated—spectral measurement from halo (adaptive).

with known spectral sensitivity functions. The normalized blue excess $((B \text{ minus } R)/(R+G+B))$ partially mitigates exposure dependence but does not resolve white-balance or camera-sensitivity confounds.

Signal Structure: Taiwan Case

The Taiwan case provides the richest signal structure data because the source did not saturate the sensor, preserving the full dynamic range of intensity variation (Figure 5). Three lines of evidence establish that the intensity pattern is non-random and physically structured:

First, the size-intensity correlation ($r = 0.808$) demonstrates that brightness increases are accompanied by physical expansion of the source, consistent with plasma emission from a volume whose size varies with energy input. Second, the size-blue excess correlation ($r = 0.323$) demonstrates that larger, brighter states exhibit a slight blue shift, consistent with higher excitation

temperatures producing shorter-wavelength emission. Third, 30 discrete bright episodes were identified with a mean duration of 1.6 frames and a mean inter-episode gap of 4.1 plus or minus 2.6 frames, with FFT analysis revealing dominant periodicities at 2.4, 7.1, and 8.5 frames.

The temporal analysis operates on 178 detected frames, which is representative of typical citizen science capture length. Frequency resolution scales with sample size; the periodicities reported here should therefore be treated as indicative of quasi-periodic behavior rather than precise spectral peaks. Confirmation using longer recordings or aggregated multi-event datasets is a clear priority for future work (see Near-Term: Calibration and Robustness, below).

Signal Structure: UK and Poland Cases

The UK and Poland cases yielded inconclusive signal structure analysis. This null result is itself informative:

Table 2. Summary of Key Quantitative Results From COPP Analysis of Three ALP Captures.

Metric	Taiwan 2021	UK 2011	Poland 2025
Source	Personal capture	YouTube XFhsCvBSMfw	YouTube Oe2olG9i3l8
Distance class	Far (est. >500 m)	Close (est. <10 m)	Close (est. <10 m)
Frames analyzed / detected	246 / 178	71 / 71	71 / 71
Apparent size (pixels)	3–57	143,485–328,369	67,154–74,303
Sensor saturation	None (0.00)	Partial (0.32)	Partial (0.35)
Position drift (px)	275 x 225	< 5 x 5	< 5 x 5
Position jumps (>30 px)	14	0	0
Peak intensity range (DN)	66–764	765 (saturated)	765 (saturated)
Intensity variation	11.6x	1.0x (clipped)	1.1x (clipped)
Measurement source	Core (direct)	Halo (adaptive)	Halo (adaptive)
Blue excess B-R (DN)	+3.7 +/- 4.3	-75.3 +/- 3.4	-77.1 +/- 3.7
Spectral class (indicative)*	COOL / Ionized	WARM / Thermal	WARM / Thermal
Size x Intensity corr.	r = 0.808	N/A (saturated)	N/A (saturated)
Dominant periods (frames)	2.4, 7.1, 8.5	N/A	N/A
Motion class	MOBILE	STATIONARY	STATIONARY

Note. * Spectral classifications are indicative only, derived from uncalibrated RGB data. COOL/Ionized denotes positive blue excess suggestive of shorter-wavelength emission, consistent with ionized atmospheric gas; WARM/Thermal denotes negative blue excess suggestive of longer-wavelength emission, consistent with thermal radiation. These terms reflect relative spectral tendency, not confirmed physical state. Distance estimates for UK and Poland cases are approximate and based on visual inspection of the recordings.

sensor saturation imposes a flat ceiling on the intensity time series, destroying the dynamic range needed for temporal pattern analysis. The implication for citizen science methodology is clear: captures at moderate distance (which avoid sensor saturation) are more analytically valuable than close-range captures that appear subjectively more impressive. This counterintuitive finding should inform citizen observation protocols.

Behavioral Classification

COPP data support a preliminary two-axis descriptive classification of the three captures. This classification organizes cases by observable spectral and kinematic features as measured by the pipeline; it does not diagnose underlying physical mechanisms or distinguish between genuinely anomalous phenomena and conventional explanations, which requires calibrated multi-instrument observation and is identified as future work. On the spectral axis, the Taiwan case is tentatively classified as cool/ionized (positive blue excess, suggestive of atmospheric gas excitation) while the UK and Poland cases are tentatively classified as warm/thermal (negative blue excess in the halo, suggestive of lower-temperature emission). These classifications are indicative and subject to the calibration limitations discussed in the Calibration Limitations section. On the

kinematic axis, the Taiwan case is mobile (275 by 225 pixel apparent drift with 14 apparent position jumps, noting that camera motion has not been separated from source motion) while the UK and Poland cases are stationary (drift less than 5 pixels, zero jumps). Whether these axes represent distinct subtypes of ALP, different observational presentations of a single phenomenon type, or artifacts of different camera and observation conditions remains an open question requiring calibrated multi-instrument observation.

DISCUSSION

Plasma Interpretation

The combined evidence from all three cases is consistent with, though not proof of, self-luminous atmospheric plasma. The indicators supporting this interpretation include: self-luminous emission (not reflected light, based on the absence of a correlated illumination source); broadband spectral emission across R, G, and B channels; correlated size-intensity variation in the Taiwan case ($r = 0.808$), where the source physically expands when it brightens, consistent with an emitting volume rather than a point source or reflection; blue excess in the distant case suggestive of ionized atmospheric gas emission; warm halo emission in the close cases suggestive of thermal emission;



Taiwan 2021 — Signal Structure Analysis

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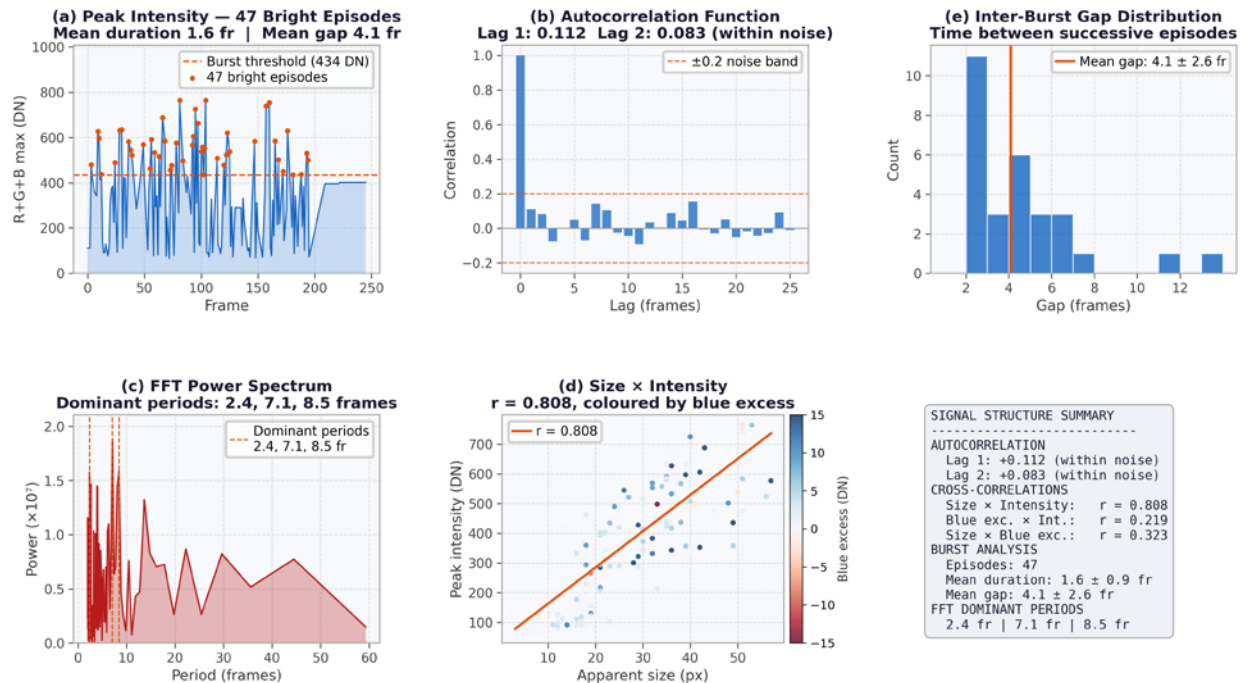


Figure 5. Signal Structure Analysis, Taiwan 2021. Six panels: (a) peak intensity time series with bright episodes marked—30 episodes identified above the burst threshold, with mean duration 1.6 frames and mean gap 4.1 frames; (b) autocorrelation function showing lag values within noise band, consistent with short-duration bursts rather than a single dominant periodic oscillation; (c) FFT power spectrum with dominant periodicities at 2.4, 7.1, and 8.5 frames, indicating quasi-periodic pulsation; (d) size-intensity scatter colored by blue excess, showing strong positive correlation ($r = 0.808$)—the source physically expands when it brightens, consistent with an emitting volume; (e) inter-burst gap distribution showing the time between successive bright episodes; (f) statistical summary including autocorrelation lags, cross-correlations, and burst statistics.

and persistent hovering behavior with, in the Taiwan case, apparent non-ballistic motion. These characteristics are broadly consistent with the physical parameters established for Hessdalen-type phenomena by Teodorani (2004) and with the electrically active atmospheric layer model proposed by Paiva (2021). However, definitive identification as plasma requires calibrated spectroscopy capable of resolving emission lines, which is beyond the capability of consumer RGB photometry.

Limitations

Several significant limitations constrain the conclusions that can be drawn from COPP analysis of consumer video. First, RGB values from in-camera processed video are not physically calibrated: autoexposure, auto-white-balance, gamma correction, tone mapping, and lossy compression all modify pixel values in device-specific, nonlinear, and

generally irreversible ways. Spectral inferences from such data are indicative rather than definitive. Second, the halo-based spectral measurement, while conceptually sound, may be contaminated by optical PSF wings, chromatic aberration, lens flare, and demosaicing artifacts that produce color gradients unrelated to the physical emission spectrum. Characterization of these artifacts on control targets is needed. Third, kinematic measurements (position drift, jumps) combine true source motion with camera motion; without background-feature-based stabilization, these cannot be unambiguously attributed to the source. Fourth, time-domain analyses use frame indices as a proxy for time, which is valid for CFR video but introduces errors for VFR sources; periodicities should be confirmed using true timestamps and methods robust to uneven sampling, such as the Lomb-Scargle periodogram (Lomb, 1976; Scargle, 1982). Fifth, detection thresholds are heuristic and have not been subjected to sensitivity analysis, ablation testing, or statistical calibration (e.g., false-positive

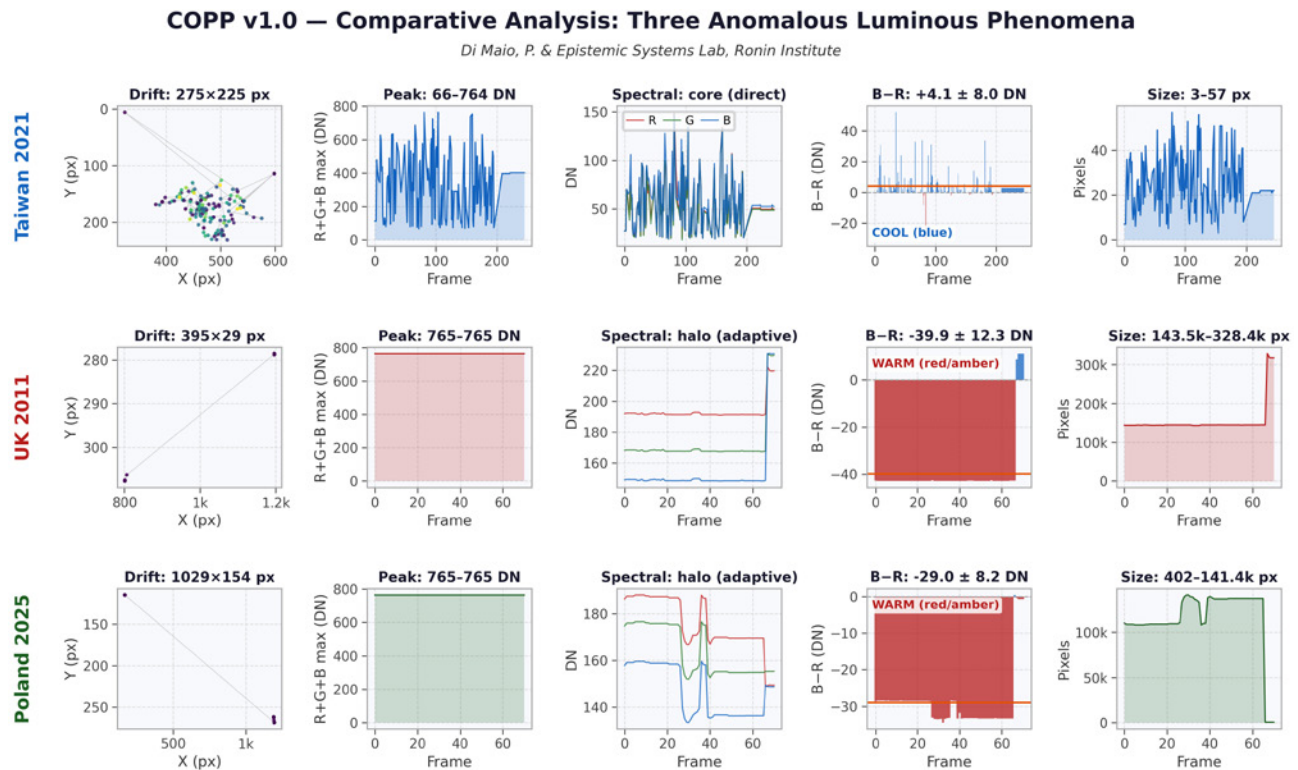


Figure 6. COPP Three-case Comparative Analysis. Each column shows one case (Taiwan 2021, UK 2011, Poland 2025) with identical five-row layout: (row 1) centroid trajectory colored by peak intensity; (row 2) peak intensity time series; (row 3) spectral channels R, G, B; (row 4) blue excess (B minus R) with mean indicated and spectral class labeled; (row 5) apparent size in pixels. Taiwan spectral measurement is from the unsaturated core (direct); UK and Poland spectral measurements are from the unsaturated halo (adaptive). Source videos: personal capture (Taiwan), YouTube XFhsCvB-SMfw (UK), YouTube Oe2olG9i3I8 (Poland).

rate estimation via negative controls). Sixth, the three-case illustrative set does not include negative controls (night sky without ALP, known stars, aircraft) or synthetic positive controls (injected signals with known parameters). Seventh, no comparison is made to established astronomical photometry toolkits such as astropy/photutils (The Astropy Collaboration et al., 2022) that incorporate well-characterized approaches to saturation, background subtraction, and color indices.

Spectral Overlap and Common Mechanism

The spectral channel overlap across all three cases, visible in Figure 6, row 3, is a notable finding that warrants cautious interpretation. Despite capture by different cameras, in different countries, over a fourteen-year span, and at distances ranging from tens of meters to possibly kilometers, the broadband RGB emission pattern shows consistent channel ordering. This consistency is suggestive of a common physical mechanism but must be weighed against the confound

that all three captures were made at night with similar scene characteristics (bright source against dark sky), and consumer camera auto-white-balance algorithms may converge to similar settings under similar scene conditions. Confirmation of spectral commonality requires either calibrated spectrometric observation of multiple ALP events or, at minimum, COPP analysis of RAW video from cameras with known spectral sensitivity functions.

Implications for Citizen Science

COPP demonstrates that consumer video captures, traditionally dismissed as anecdotal evidence, contain quantitatively extractable photometric information. The pipeline's adaptive spectral measurement enables meaningful comparison between captures made under radically different conditions, a capability that has not previously been available to citizen observers. The counterintuitive finding that moderate-distance captures (which avoid

sensor saturation) are more analytically valuable than close-range captures suggests that citizen observation protocols should be updated to recommend recording at a distance when possible, and to avoid zooming in to the point of sensor saturation.

FUTURE WORK

Intrinsic limitations of COPP v1.0 define a clear development roadmap organized into near-term improvements, medium-term extensions, and longer-term research directions.

Near-Term: Calibration and Robustness

The most critical improvement is reducing device dependence in spectral measurements. Where RAW sensor data are available, COPP should perform black-level subtraction, linearization (inverse gamma), demosaicing control, and white-balance normalization before computing spectral metrics. For processed sRGB sources (the majority of citizen captures), COPP should apply approximate inverse sRGB gamma, report normalized chromaticity coordinates $((B \text{ minus } R)/(R+G+B))$ and CIE xy estimates) alongside raw DN values, and flag frames where auto-exposure or auto-white-balance metadata indicate mid-capture changes. Camera spectral sensitivity (CSS) estimation, even approximate, would enable camera-aware color normalization following approaches from the spectral reconstruction literature (e.g., Arad et al., 2020).

Detection thresholds should be replaced with statistically principled alternatives: percentile-of-background, robust z-scores, or extreme value theory (EVT) based cutoffs with controlled false-positive rates, following approaches demonstrated in low-SNR detection domains. A formal sensitivity analysis and ablation study across threshold parameters, bit depths, and scene types should accompany any threshold scheme.

Time-domain analyses must be converted to operate on true timestamps extracted from video container metadata, with resampling to uniform time for FFT and autocorrelation, or replacement by methods designed for unevenly sampled data such as Lomb-Scargle periodograms (Lomb, 1976; Scargle, 1982) or singular spectrum analysis (SSA). P-values for temporal tests should account for autocorrelation via block bootstrap or autoregressive modeling and be corrected for multiple testing when reporting several periodicities.

Near-Term: Motion Compensation and Controls

Camera motion compensation via background-feature-based stabilization (feature detection, homography estimation, affine warping) should be implemented as a preprocessing step before kinematic analysis, enabling separation of true source motion from camera jitter, pan, and dropped-frame artifacts. Only motion residuals after stabilization should be reported as source kinematics.

The demonstration set must be expanded to include negative controls (night sky footage without ALP, known astronomical sources such as bright planets and stars, aircraft with known trajectories) to estimate false detection and false classification rates. Positive synthetic controls should inject known signals (point sources with specified intensity profiles, pulsation patterns, spectral indices, and saturation levels) into real background frames to quantify COPP's recovery accuracy for each measured parameter.

The optical PSF and halo profile of each capture device should be characterized using control targets (bright stars, point lights at known distances) to distinguish physical emission halos from optical artifacts (PSF wings, chromatic aberration, lens flare, demosaicing color fringing). This characterization would validate or invalidate halo-derived spectral measurements on a per-device basis.

Medium-Term: Baselines and Community Tools

COPP should be benchmarked against established astronomical photometry toolkits, specifically astropy/photutils aperture and PSF photometry (The Astropy Collaboration et al., 2022), to quantify comparative accuracy in source detection, centroid precision versus SNR, intensity stability across frames, and color index consistency. Standard astronomical practices for handling saturation (aperture growth curves, PSF fitting with saturation masking) should be evaluated for applicability to ALP sources. A browser-based implementation of the pipeline is publicly accessible at <https://copp-w.vercel.app/>, enabling any citizen with a video recording and a browser to run the analysis.

Community capture guidelines should be formalized and distributed, incorporating the counter-intuitive finding that moderate-distance, unsaturated captures are more analytically valuable. Specific recommendations include lock exposure and white balance if the device permits; avoid digital zoom to prevent additional interpolation artifacts; include a reference light source in the field of view if

possible for post-hoc calibration; and record in RAW or the highest-quality format available.

Development of a formal observation ontology using W3C standards would enable structured, machine-readable reporting of ALP observations, facilitating aggregation, search, and cross-referencing across citizen reports, institutional databases (NUFORC, MUFON, GEIPAN), and automated monitoring networks (Sky360, Project Hessdalen).

Longer-Term: Expanded Modalities and Cross-Validation

Extension to infrared modality using military-release FLIR footage would test COPP's framework on a different sensor type and spectral range. Integration of diffraction grating spectral data (from amateur spectrometers or calibrated field instruments) would enable chemical composition analysis through emission line identification. Correlation with geophysical parameters (seismic activity, electromagnetic field measurements, atmospheric electrical data, geological surveys) would test physical generation models such as piezoelectric discharge and electrically active inversion layers. An example of such integrated environmental analysis is provided by Houran et al. (2025), who conducted electromagnetic field measurements and environmental surveys at a reported anomalous phenomena site, demonstrating the feasibility of multi-parameter field characterization in this research domain. Cross-camera robustness testing using hyperspectral reference data rendered through multiple camera spectral sensitivity functions would quantify COPP's stability under realistic device variation. Machine learning classifiers trained on COPP-extracted features could enable automated ALP detection in continuous monitoring streams, and validation against calibrated Hessdalen AMS data (in collaboration with researchers who maintain these archives) would provide the strongest test of COPP's physical accuracy.

Next-Generation Capture Protocols and Multispectral Integration

Consumer imaging hardware is approaching a capability threshold relevant to COPP. Apple has disclosed exploration of multispectral imaging technology for future iPhone camera systems, targeting improved material detection and image processing fidelity (Hardwick, 2026). If multispectral capture becomes standard in consumer devices,

COPP v2 could ingest per-pixel spectral data across more than three channels, substantially improving the physical interpretability of ALP emission signatures and reducing dependence on the RGB calibration caveats that constrain the current version.

A parallel development priority is standardized optical filter protocols for citizen scientists actively pursuing ALP field observation. Consumer clip-on optical filters—polarizing, neutral density, or narrowband—attached to smartphones could reduce image saturation for close-range captures and provide a calibration anchor for post-processing. A COPP filter mode, in which known filter transmission curves are applied as correction factors during spectral analysis, would enable more physically meaningful cross-case comparison. Establishing a recommended filter specification for the citizen ALP community is identified as a near-term collaborative development target.

These directions—multispectral ingestion and filter-calibrated capture—represent the primary hardware-side development pathway for COPP v2, complementing the software-side improvements described in the preceding Future Work subsections.

CONCLUSION

The Citizen Orb Photometry Pipeline establishes that consumer video recordings of anomalous luminous phenomena contain extractable photometric information amenable to standardized computational analysis. The three-case comparative analysis demonstrates broadband spectral consistency across observations made in different countries, years, and conditions, which is suggestive of a common physical mechanism though subject to the significant calibration caveats inherent in uncalibrated consumer RGB data. The Taiwan case provides evidence of non-random temporal structure, including correlated size-intensity expansion ($r = 0.808$), a correlation between size and blue excess ($r = 0.323$), and quasi-periodic pulsation. These temporal findings, which depend on intensity ratios rather than absolute calibration, are more robust to device confounds than spectral conclusions.

COPP v1.0 should be understood as a first-generation methods demonstration that establishes feasibility and identifies a clear development roadmap. Substantial improvements in calibration rigor (RAW processing, CSS normalization, inverse gamma), kinematic analysis (camera motion compensation), temporal analysis (true timestamp extraction, Lomb-Scargle), threshold calibration (statistical false-positive control), and validation



(negative and synthetic controls, astronomical photometry baselines) are needed before COPP's spectral and kinematic claims can be considered definitive. Nevertheless, the pipeline addresses a documented tooling gap in citizen ALP observation, and its standardized outputs provide a foundation upon which these improvements can be built. The code, per-frame data, and source videos for all three cases are released with this paper to enable independent replication and alternative analyses. Readers are invited to use the online COPP tool, evaluate it, and test it. Contact the author for further development. The COPP v1.0 pipeline demo, available at <https://copp-w.vercel.app/>, is a working prototype; the results reported in this paper should be considered work in progress, based on ongoing analysis of three captures available to the author at the time of writing. More detailed metrics require thorough evaluation against larger and more varied datasets before they can be considered reliable or consistent at scale. We anticipate ongoing refinement of the measurement procedures of the pipeline and its demo implementation and to derive reliable statistics in future versions, in particular the temporal analysis, which will be reimplemented on true timestamps using methods appropriate to unevenly sampled data.

CONFLICTS OF INTEREST

The author has no conflicts of interest to disclose.

DATA AVAILABILITY

The dataset is now public here <https://zenodo.org/records/22153927>. The pipeline code and per-frame data for all three cases are released with this paper; the two third-party source videos are identified by their public URLs rather than redistributed.

AUTHOR NOTE

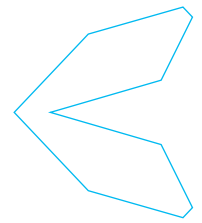
Citizen Orb Photometry Pipeline (COPP) v1.0: Standardized Photometric Analysis of Anomalous Luminous Phenomena in Consumer Video is also available on Protocols.io DOI: <https://dx.doi.org/10.17504/protocols.io.n92ldo7eng5b/v1>

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RESEARCH
ARTICLE

Investigating Remote Electrogastrogram Modulation Via Emotional and Eating Stimuli: A Sham-Controlled Pilot Study

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ABSTRACT

This pilot study investigated whether gastrointestinal activity, measured via electrogastrography (EGG), can be influenced nonlocally by a distant, emotionally bonded partner. Using a double-blind, sham-controlled design, thirty adult pairs were randomized to a Real or Sham condition. In the Real condition, the Sender experienced sad and food-related stimuli (selecting and eating food) while intending to transmit their experience to the distant Receiver; in the Sham condition, no stimuli were presented. Although the preregistered hypothesis predicting amplitude changes was not supported, a Linear Mixed-Effects analysis identified a significant Condition $\times$ Epoch interaction for EGG frequency. Follow-up tests showed unexpectedly large decreases in Receiver gastric frequency during the Sender's "sad" epoch and more robustly during the "eating" epoch. This specific slowing of gastric rhythm aligns with parasympathetic (vagal) modulation rather than a generalized sympathetic response. These preliminary results suggest that EGG frequency may be a sensitive physiological marker of nonlocal interpersonal influence, particularly for interoceptive states involving eating, although the underlying autonomic pathway cannot be determined from EGG alone.

KEYWORDS

Electrogastrography, Nonlocal interpersonal influence, Gut telepathy, Intuition.

INTRODUCTION

Intuition, or knowing something immediately without relying on logical reasoning or inference, is often associated with the gut. This association is reflected in everyday language across cultures: in English, we "trust our gut" or have a "gut feeling;" in German, *Bauchgefühl* also means "gut feeling;" in French, *un noeud dans l'estomac* refers to "a knot in the stomach." Scientific research supports this association, pointing to the enteric nervous system (ENS) as a key physiological substrate involved in intuitive processes (Mayer, 2011; Soosalu

et al., 2019). Often referred to as the body's "second brain," the ENS contains hundreds of millions of neurons and regulates digestion, immunity, and hormone production. It communicates bidirectionally with the brain through the gut-brain axis, forming an integrated system that influences both physiological and psychological states. Emerging evidence suggests that this axis may play a central role in the somatic basis of intuitive cognition, decision-making, and emotional insight (Fleming et al., 2020; Furness et al., 2014; Gershon, 1999; Gershon & Margolis, 2021; Mayer, 2011).



Many intuitive experiences can be attributed to environmental cues, subliminal stimuli, tacit knowledge, and unconscious somatic influences (Bechara et al., 1997; Damasio, 1996; Hodgkinson et al., 2008; Lufityanto et al., 2016). However, a subset of these experiences may suggest a nonlocal component to intuition, where individuals report similar sensations or even physiological changes despite being separated by great distances. In the 1960s, Berthold Schwarz documented numerous such cases and introduced the term “*telesomatic*,” derived from Greek roots meaning “distant body,” to describe instances in which individuals report feeling the sensations or symptoms of others from a distance (Schwarz, 1967). In a later study, Mann and Jaye (2007) interviewed 20 adult twins who collectively reported over 50 *telesomatic* events. These events were most commonly felt during significant life events or vulnerable periods such as pregnancy, childbirth, surgery, or accidents. Respondents often described their experiences within the context of strong emotional bonds between empathic twins. The cases generally fell into three categories: (1) both twins experienced similar physical symptoms (e.g., labor pain or nausea); (2) one twin experienced an emotional state that mirrored the other’s distress (e.g., anxiety, grief, fear); and (3) one twin experienced a physical symptom associated with the other’s condition, even when the originating twin did not exhibit that specific symptom. While such accounts are subjectively vivid, they also prompt inquiry into whether distant interpersonal experiences can produce measurable, subconscious physiological effects.

Scientific investigations have begun to map the physiological signatures that may underlie intuitive experiences, particularly those outside conscious awareness (McCraty et al., 2004a, 2004b; McCraty & Atkinson, 2014; McCraty & Zayas, 2014; Radin, 2008; Rezaei et al., 2014), leading to the emergence of the term *nonlocal intuition*. This term refers to the perception of information about a distant or future event by the body’s psychophysiological systems, independent of reason, inference, or prior memories (Rezaei et al., 2014). One notable study by Radin and Schlitz (2005) explored the potential for gut-based registration of distant emotional experiences using cutaneous electrogastrography (EGG), a validated, noninvasive measure of gastric myoelectrical activity (Muth et al., 1999; Stern et al., 2001; Wolpert et al., 2020). Unlike the brain, which is strongly modulated by cognitive filters and conscious attention, the gut operates largely outside of awareness, potentially offering a more direct physiological index of subtle interpersonal influence. Radin and Schlitz found

that EGG amplitude was significantly higher when a distant partner was exposed to emotional (positive or negative) stimuli compared to neutral stimuli, with effects reaching statistical significance for both positive ($p = .006$) and negative ($p = .0009$) emotions. These findings suggest that gut-based measures may be sensitive to distant emotional states under controlled conditions.

The present study builds upon and seeks to replicate the most robust finding on this subject from Radin and Schlitz (2005): a change in gut activity corresponding to a distant partner’s exposure to negative (sad or upsetting) emotional stimuli. To extend this work, we incorporated a sham condition and added behavioral measures to explore correlations with EGG responses. A further novel feature of this study is the inclusion of food-related stimuli, based on the rationale that if some form of unconscious telepathic signaling is an emergent property of the ENS, such effects may be particularly pronounced during digestion-related activity because that is the system’s primary function.

This study involved two conditions, Real and Sham, and two participant roles. In the Real condition, one individual in an emotionally bonded pair served as a distant *Sender* exposed to specific stimuli, while the other person served as a *Receiver*, from whom EGG recordings were collected. In the Sham condition, the Sender engaged in a separate distractor task and was not exposed to stimuli, while the Receiver’s EGG was recorded.

The first aim of this study was to examine whether the Receiver’s EGG activity in the Real condition differed across four 2-minute epochs experienced by the Sender: a neutral emotion, a sad emotion, while selecting food to eat, and when starting to eat food. It was hypothesized that (a) in the Real condition the Receiver’s EGG activity would be significantly greater during the last three epochs than during the neutral condition, that (b) in the Sham condition the Receiver’s EGG activity across the epochs would not differ, and that (c) the same measures across Real vs. Sham conditions would show differences favoring effects in the Real condition.

A second aim was to compare the Receiver’s EGG activity across the entire eating epoch, where it was hypothesized that EGG activity during the eating epoch would be significantly different between the Real and Sham conditions. A third aim was to explore whether differences in participant characteristics might influence the outcomes by assessing correlations between EGG activity and interoceptive decision-making styles, self-reported psi abilities, degree of emotional bondedness between pairs, and personal patterns related to gut health. It was hypothesized that these

characteristics may be associated with the degree of any effects observed through the first two aims.

METHODS

Participants

Participants were recruited in pairs through social media advertisements, with a prespecified minimum of 30 pairs. As this was a pilot study, the sample size was based on available funding and in reference to the prior study by Radin and Schlitz (2005), which reported a significant effect for sad emotional stimuli with an overall z -score of 3.13 ($p = .0009$) based on 26 pairs of participants, Cohen's $d = 0.61$. To estimate the expected statistical result for a smaller sample, we adapted their statistical model to $n = 15$ pairs, which yielded an estimated $z = 2.34$ ($p < .05$), with one-tailed statistical power $\approx 70\%$.

The recruitment ads indicated that the study aimed to explore telepathy, and interested individuals were asked to invite a partner with whom they shared an emotional connection. Inclusion criteria included: 1) adults 18 or older, 2) English competency, and 3) belief that telepathy is possible. Exclusion criteria were self-reported: 1) gastric or digestive disorder, 2) current use of prokinetic anti-emetic agents, narcotic analgesics, anticholinergic drugs, probiotics or prebiotics, and 3) pregnancy. Participants were recruited and participated on a rolling basis between

December 2024 and February 2025. Compensation for each participant in the pair consisted of lunch and \$100 via the PayPal app.

Seventy-three individuals provided informed consent and completed the initial questionnaires. Of these, thirteen were excluded due to ineligibility or other reasons (e.g., scheduling issues or declined after enrollment). Sixty participants were enrolled in the study as pairs and randomly assigned to either the experimental (Real) or the control (Sham) group. All 30 pairs completed the study protocol, and data from all 30 Receivers (15 in each group, Real and Sham) were included in the analysis (see Figure 1; note that EGG data were collected and analyzed only from one member of each pair (the Receiver).

Each participating pair attended an individually scheduled laboratory session, arriving at the laboratory (Novato, CA) between 11:15 a.m. and 11:30 a.m. on the day of their scheduled session, after having eaten a standardized breakfast (see details in the next section). The research team assigned roles within each participant pair, designating one as the Sender, who would attempt to transmit telepathic signals, and the other as the Receiver (from whom EGG data were collected and who would ostensibly receive the transmitted signals), based on a decision tree aimed at optimizing EGG recording quality. Role assignment prioritized the amount of torso body hair and body mass index (BMI). The individual with the least torso hair was

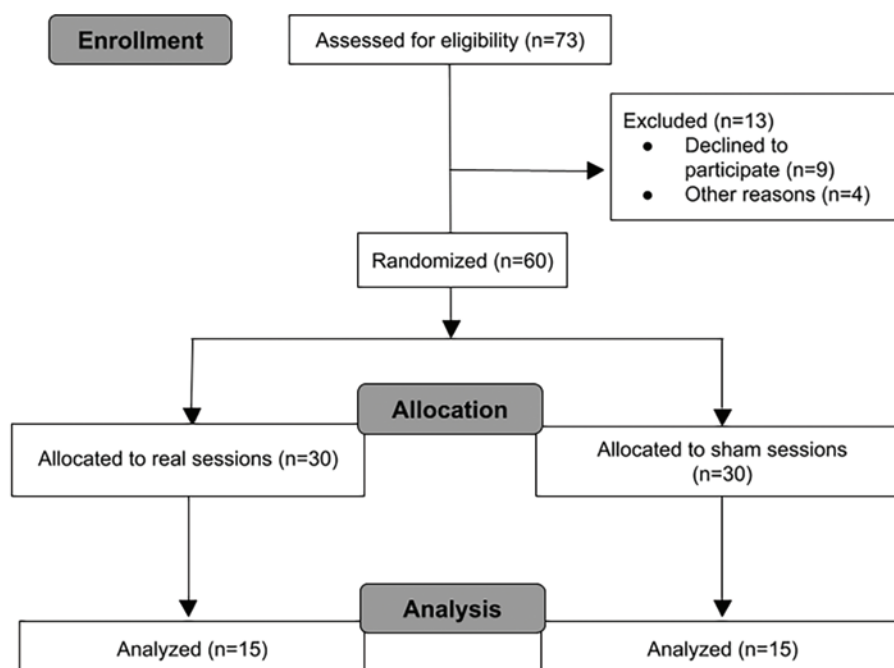


Figure 1. Participant Recruitment and Randomization Flowchart.

preferred as the Receiver because body hair can interfere with proper electrical contact with the skin. This consideration resulted in all male participants in this study being assigned to the Sender role; no men served as Receivers. Regarding BMI, participants with a BMI at or below 25 were preferred as Receivers, since higher BMI is associated with reduced signal sensitivity due to abdominal adiposity (Obioha et al., 2013). To help support a shared sense of connection between the pair, the Sender and Receiver exchanged a personal, meaningful item (e.g., a ring or photograph), which they held during the session.

Standardized Breakfast

On the morning of their experimental session, participants were instructed to eat a standardized breakfast, finishing by 8:30 a.m., and then to consume only water until they arrived at the laboratory. This standardized meal protocol was intended to help ensure consistent hunger levels across participants. Participants were instructed to eat one of several meal options, each containing approximately 300–400 calories and 5–7 grams of dietary fiber. Examples of breakfast options were suggested, but substitutions were permitted, provided that the total caloric and fiber content remained within the specified ranges.

EGG Recording and Processing

Before electrode placement, the designated abdominal areas were cleansed using an unscented astringent for sensitive skin (Witch Hazel) to improve skin conductivity. Three pre-gelled disposable Ag/AgCl surface electrodes were then affixed using a standardized configuration for EGG (Oczka et al., 2024). The central electrode was positioned at the midpoint along a straight line connecting the xiphoid process and the umbilicus. The right lateral electrode was placed approximately 5 cm (two finger widths) below the lower edge of the right rib cage, and the left lateral electrode was placed approximately 5 cm below the lower edge of the left rib cage. EGG signals were amplified by a Biopac EGG100C amplifier (set to 1000 gain, low pass filter at 0.1 Hz, high pass filter at 0.005 Hz) and digitized by a Biopac MP150 physiologic system recording at 100Hz.

Randomization of Treatment Groups (Real vs. Sham)

Randomization to either the Real or Sham group was conducted in advance to ensure balanced group assignment across participant pairs. After all baseline data were

collected, the study's research coordinator randomized participants. The research team in the laboratory opened unmarked envelopes that contained the randomization assignment only after electrode placement was completed, ensuring that the setup procedures remained unbiased. Upon completion of the session, the corresponding EGG data were transferred to a remote team member (DR) for blinded analysis.

Receiver Procedures

The procedures for the Receiver were identical for both Real and Sham conditions. After electrode placement, the Receiver moved to a "zero-gravity" reclining chair (Relax the Back, Menlo Park) in a dedicated Receiver Room, with their knees lifted slightly above heart level. After confirming successful data acquisition from the EGG electrodes, the Receiver was instructed to relax, minimize movement, and sustain an intentional mental link with the Sender. The Receiver was informed that the Sender would periodically view them over closed-circuit video, but was unaware of the specific timing or duration of these views. A video camera set on a tripod was placed to capture the Receiver's live image throughout the experimental session. Active noise-cancelling headphones were placed over the Receiver's ears to promote relaxation and mask ambient sounds.

Real Session Sender Procedures

The Sender was seated in front of a split-screen monitor in the Sender Room, approximately 15 meters from the Receiver Room. Between the two rooms was a fully enclosed intervening room with closed doors at both ends, ensuring complete visual and auditory isolation. These doors were never opened simultaneously; when staff entered or exited one room, the opposite door remained closed, preventing any possible sensory leakage between participants. One side of the monitor intermittently displayed a live video feed of the Receiver, while the other side presented stimuli and instructions. The Sender remained seated throughout the session, following the on-screen instructions. Research staff entered the Sender Room only during breaks between stimulus presentation epochs. During each sending epoch, the Sender was instructed to periodically gaze at the Receiver's live feed and deliberately transmit the emotions and sensations elicited by the stimuli. During rest intervals, the Sender was asked to withdraw attention and relax.

Real Session Stimulus Protocol

Digitized signals from the Biopac system and computer were transmitted over a local area network to a separate computer in the Sending Room that controlled the experiment and presented stimuli and instructions to the Sender. Upon initiation, a MATLAB program running on a PC randomly selected a sequence of two 2-minute epochs, one designed to elicit sad emotions and the other to elicit neutral emotions, and simultaneously during these epochs: 1) displayed the Receiver's live video image, 2) displayed the appropriate emotional stimuli, and 3) sent electrical markers indicating the timing and type of stimulus to the Receiver's Biopac system.

The emotional epoch consisted of 20 International Affective Picture System (Lang et al., 2005) sad images (e.g., graveyard), displayed for 6 seconds each, with arousal ratings within 3.67 and 6.36 and valence ratings within 1.78 and 4.08, along with audio of Samuel Barber's *Adagio for Strings*. The neutral emotion epoch consisted of a series of gray-hued rectangles accompanied by pink noise. A two-minute sensory food cue epoch followed these emotional epochs. During the break preceding the food cues epoch, research staff entered the room with a cart loaded with four lunch options. At this point, the Sender was prompted to choose lunch items for themselves and their partner, and the computer monitor displayed the live image of the Receiver alongside the written instruction: "Choose your lunches!" and no audio was played. The final epoch (eating epoch) lasted approximately 20 minutes. During this period, the Sender tasted the lunch items and ate as

much as desired while focusing on transmitting the quality of their experience to the Receiver. No audio was played during this time, and the monitor displayed a live image of the Receiver alongside the written instruction: "Taste the Food!" This period was followed by several additional minutes to capture the expected lingering gastric effects of food ingestion, as these physiological responses persist beyond the act of eating (Sheiner et al., 1980). The exact duration of the post-ingestion interval varied slightly due to logistical constraints. During each 30-second inter-epoch rest period, the computer monitor with the Receiver's image switched to black, and the other window presented the word "relax" in green on a black background. The sequence of stimulus epochs and timeline for EGG recording is illustrated in Figure 2.

Sham Session Stimulus Protocol

In the Sham sessions, the timing of stimulus presentation and EGG recording mirrored the Real sessions, but the Sender remained unaware. To maintain blinding, the computer displaying stimuli and the Receiver's video feed was positioned out of the Sender's sight, behind a screen on the opposite side of the Sender Room with its lid pushed nearly closed so the display was not visible from a standing or seated position. Audio was muted throughout. Meanwhile, the Sender was intentionally distracted with a video clip (Dr. Rupert Sheldrake discussing telepathy research involving an African Grey parrot) and a related, nonessential questionnaire, designed to give the impression that the session had not yet begun. The Receiver did not consume

Timeline for EGG Recording

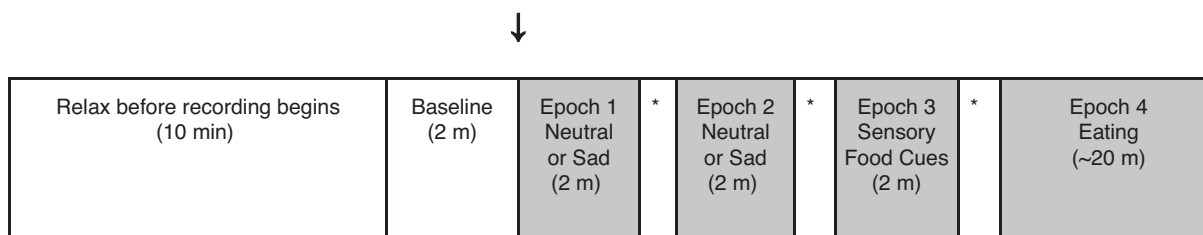


Figure 2 Timeline for EGG Recording. *Note:* EGG recording for each session began with a 10-minute relaxation period and a 2-minute baseline period. Stimulus presentation epochs 1 and 2 consisted of neutral or sad emotions presented randomly (2 minutes each). Epoch 3 consisted of sensory food cues (2 minutes), and epoch 4 consisted of ingesting the chosen lunch (~20 minutes). Shaded blocks indicate when the closed-circuit video of the Receiver was visible to the Sender during Real sessions. For Sham sessions, the stimulus presentation epochs and EGG recording were identical to the Real sessions. However, the computer presenting the stimuli and the closed-circuit video of the Receiver was not visible to the Sender, and the audio was muted. The arrow denotes the "start" condition mark that indicates the beginning of the experiment. *30-second rest periods between epochs.

any food during the session. There were no indications of experimental group assignment in computer signaling and data acquisition. When the session was complete, the pair was informed that they had been randomly assigned to the Sham condition, and then both parties were allowed to select and eat their lunch options.

Questionnaires

All participants completed questionnaires to assess relevant psychological and physiological characteristics before participating in the study. These included the Multiple Brain Preference Questionnaire, which evaluates intuitive versus cognitive decision-making styles across domains of head, heart, and gut interoception (Soosalu et al., 2019), and the Noetic Signature™ Inventory, which measures sensitivity to experiences and information perceived to transcend space and time (Wahbeh et al., 2022). Participants also completed an assessment of bondedness using a Likert-scale measure of emotional closeness between partners, as well as the Gastrointestinal Symptom Rating Scale (AstraZeneca, 1995), a 15-item questionnaire that assesses five gastrointestinal symptom clusters on a 7-point scale, commonly used in adults with irritable bowel syndrome and peptic ulcer disease.

Analysis

Analytic Approach

This study served as an exploratory conceptual replication of Radin and Schlitz (2005), incorporating several design modifications, including the introduction of a sham control and a more sophisticated analytical approach. In the 2005 study, spikes in Receiver EGG activity were anecdotally observed when images of food (e.g., an ice cream sundae) were displayed to the Sender during positive emotion epochs. The present study formally tested this observation by incorporating explicit sensory food cues and eating epochs. All study procedures were registered before data analysis with the Koestler Parapsychology Unit (#1095).

The registered goals addressed three specific aims: **(1)** to examine changes in the Receiver's EGG activity across emotional and food-related epochs within each Real and Sham session relative to an initial baseline period, **(2)** to compare the Receiver's EGG activity during the entire eating epoch across Real and Sham conditions, and **(3)** to explore correlations between Receiver's EGG activity and individual or dyadic characteristics as assessed through the

questionnaires. These aims were first addressed through analysis of EGG amplitude, following the procedures outlined below, and then through an exploratory analysis of EGG frequency.

Aims 1 and 2

Each raw EGG record per session was preprocessed to extract the segment of data relevant to that experimental session. For each segment, a "begin" condition mark defined the start of the session and an accompanying baseline epoch, which consisted of a two-minute window immediately preceding that mark. The end of the segment was defined as an "end" mark at the session's close. Once extracted, the segment was filtered using a low-pass filter with a cutoff frequency of 0.2 Hz to suppress electromyographic and motion artifacts while retaining the gastric slow-wave band (Parkman et al., 2003). The segment was then linearly detrended and down sampled by a factor of 10, reducing the 100 Hz sample rate to 10 Hz. This segment was used for subsequent EGG frequency analyses (EGG_f, for filtered). For EGG amplitude analyses, the same segment was first normalized (using the segment's mean and standard deviation) and then the absolute values of those values were determined (EGG_z, for z-score normalized).

For the amplitude analysis, following the approach used in the Radin and Schlitz (2005) study, the maximum value of the EGG_z signal associated with each of the two-minute baseline, neutral, sad, select food, and start of the eating food epochs was determined, as well as the mean of the full ~20-minute eating epoch. The maximum of each shorter epoch was used to more closely conform to the analytical method used in Radin and Schlitz (2005), and to provide a means of capturing the sudden "spikes" in Receiver EGG reported in that study when images of food were used as stimuli. If a mean value were used to summarize the shorter epochs, that may have washed out the purported spikes of interest. For the frequency analysis, the dominant frequency was determined for each of these epochs using the EGG_f signal (Chen et al., 1996).

The originally preregistered analysis plan called for assessing within-session differences among the epochs using a circular-shift permutation method. That approach was intended to create a nonparametric estimate of the null distribution by cyclically shifting the time series, thereby preserving local autocorrelation while randomizing temporal alignment between stimulus epochs. However, upon closer inspection, three reasons were found to make this method inappropriate for the present dataset.

First, the EGG signals, especially the amplitude measures, were distinctly non-stationary, exhibiting drifts and a relaxation phase during the first several minutes of each session. The circular-shift procedure assumes temporal stationarity, where statistical properties, such as the mean and variance, are constant throughout the recording. The observed data violated that assumption, so applying time shifts would have distorted the underlying structure and obscured or inflated any apparent differences. Second, the experiment involved discrete, non-exchangeable epochs (neutral, upset, select, and eat), each representing different experimental conditions. Circular shifting would have mixed data across these conditions, thereby obscuring any meaningful correspondence between the hypothesized physiological responses in the various epochs. Third, the study aimed to assess systematic within-session modulations, specifically whether EGG amplitude or frequency changed in predictable ways during particular epochs, rather than testing a global null hypothesis of no temporal structure.

For these reasons, analysis was shifted to a Linear Mixed-Effects (LME) framework, which more accurately accommodates both the repeated-measures structure and inter-subject physiological variability of the EGG signals. The LME approach allowed for fixed effects for the experimental conditions and random effects for the participants, capturing both population-level trends and individual differences while avoiding violations of temporal dependencies. This provided a statistically robust and conceptually more appropriate method for testing both the hypothesized within-session epoch differences and cross-condition (i.e., Real vs. Sham) effects during the longer eating period. Due to the shift in analytical methods, the results of this study should be interpreted with caution as exploratory.

Aim 3 Analysis

To test Pearson's correlations between the EGG outcomes and participant characteristics, the EGG data were reduced to average amplitude and average frequency, and then the indicated surveys were each reduced to a single summary variable. Variables were assessed for normality using the Anderson-Darling normality test. Where data were collected from both parties, the data from the Receiver was taken as the best representative of the information received for that pair. Data were then separated by group - Real or Sham -, and each was separately analyzed to test each pairwise correlation between the six variables: average EGG amplitude, average EGG frequency,

Bondedness, Multiple Brain Preference, Gastrointestinal Symptom Rating Scale, and Noetic Signature Index. To compare each correlation observed for the experimental vs. sham groups, Fisher's r to Z transformation was used, followed by two-sample Z tests.

RESULT

The demographic characteristics of the randomized participants in the two experimental groups (Real and Sham) did not differ significantly in terms of age, sex, race, or the questionnaire responses (see Table 1). Regarding Aims 1 and 2, which examined changes in the Receiver's EGG activity during the Sender's emotional and food-related epochs both within and across sessions, descriptive statistics are provided in Table 2, and an equivalence test for the amplitude and frequency baselines in the Real and Sham conditions is shown in Table 3. The results of the LME analysis are presented in Table 4. Table 5 lists the post-hoc comparisons and their

Table 1. Sample Demographics and Questionnaire Outcomes.

Measure	Units / Categories	Real Group	Sham Group
		Values M (SD) or n (%)	
Age (60)	Years	57.3 (15.5)	55.9 (15.6)
Sex (60)	Female	23 (76.6%)	18 (60%)
	Male	7 (23.4%)	12 (40%)
Race* (60)	Native American	0	0
	Asian	0	1 (3.3%)
	African	1 (3.3%)	0
	Middle Eastern	0	0
	Native Pacific Islander	0	1 (3.3%)
	Latinx/Hispanic	8 (26.7%)	3 (10%)
	European	16 (53.3%)	18 (60%)
	Other	3 (10%)	6 (20%)
	Decline to Answer	2 (6.7%)	1 (3.3%)
Bondedness (30)	Likert-scale scores	25.60 (20.40)	38.00 (23.59)
Multiple Brain Preference (30)	Dimensionless %	61.18 (5.18)	61.03 (3.65)
GI Symptom Rating Scale (30)	Likert-scale scores	0.75 (0.54)	0.65 (0.60)
Noetic Signature (30)	Not Applicable	59.61 (14.90)	53.86 (13.14)

* Participants could check more than one race. Values in parentheses in the first column indicate the number of participants completing each measure. Data on emotional bondedness with one's partner, interoceptive decision-making styles, personal patterns related to gut health, and self-reported psi abilities were analyzed only from one member of each pair (the Receiver).



Table 2. Descriptive Statistics for EGG Amplitude and Frequency in the Real and Sham Conditions, Based on 15 Pairs of Participants in Each Condition.

Measure	Epoch	Real (Mean $\pm$ SD)	Sham (Mean $\pm$ SD)
Amplitude (μ V)	Baseline	3.82 $\pm$ 3.22	4.86 $\pm$ 4.20
	Neutral	4.65 $\pm$ 4.84	4.27 $\pm$ 4.06
	Upset	2.93 $\pm$ 1.18	5.27 $\pm$ 4.16
	Select	4.98 $\pm$ 6.70	4.44 $\pm$ 5.33
	Eat	2.49 $\pm$ 1.19	3.19 $\pm$ 1.46
	Eat all	0.64 $\pm$ 0.18	0.62 $\pm$ 0.23
Frequency (Hz)	Baseline	3.38 $\pm$ 0.81	3.63 $\pm$ 1.18
	Neutral	3.89 $\pm$ 1.18	3.38 $\pm$ 1.19
	Upset	2.99 $\pm$ 0.61	3.87 $\pm$ 1.14
	Select	3.26 $\pm$ 0.88	3.89 $\pm$ 1.10
	Eat	3.13 $\pm$ 0.83	3.46 $\pm$ 0.79
	Eat all	2.66 $\pm$ 0.42	3.46 $\pm$ 0.96

Table 3. Equivalence Tests for EGG Amplitude and Frequency Baselines.

Measure	Condition	Mean $\pm$ SD	t(28)	p
Amplitude (μ V)	Real	3.82 $\pm$ 3.22	-0.76	.45
	Sham	4.86 $\pm$ 4.20		
Frequency (Hz)	Real	3.38 $\pm$ 0.81	-0.69	.50
	Sham	3.63 $\pm$ 1.18		

Note: Values represent baseline EGG measures prior to stimulation. No significant differences were found between the REAL and SHAM groups.

Table 4. Linear Mixed-Effects Model Results for Epochs within Real and Sham Conditions, and Interactions between Real and Sham Conditions.

Term	F(df ₁ , df ₂)	p
Amplitude ANOVA		
Intercept	17.23 (1, 168)	< .001
Condition	0.64 (1, 168)	.425
Epoch	3.01 (5, 168)	.013*
Condition $\times$ Epoch	0.69 (5, 168)	.631
Frequency ANOVA		
Intercept	202.16 (1, 168)	< .001
Condition	0.57 (1, 168)	.451
Epoch	3.02 (5, 168)	.012*
Condition $\times$ Epoch	2.29 (5, 168)	.048*

Note: p values < .05 are marked with an (*).

associated FDR-adjusted p-values. These results are summarized visually in Figure 3.

DISCUSSION

This double-blind sham-controlled study tested whether the gastrointestinal activity of one individual was

Table 5. Post-hoc Tests for EGG Amplitude and Frequency Across Epochs.

Measure	Epoch	Cohen's d	p-value	FDR-adjusted p
Amplitude (μ V)	Baseline	-0.28	.45	.82
	Neutral	0.09	.82	.82
	Upset	-0.77	.045*	.27
	Select	0.09	.81	.82
	Eat	-0.53	.16	.48
	Eat all	0.12	.76	.82
Frequency (Hz)	Baseline	-0.25	.50	.50
	Neutral	0.43	.25	.33
	Upset	-0.97	.013*	.04*
	Select	-0.63	.10	.20
	Eat	-0.41	.27	.33
	Eat all	-1.08	.006*	.04*

Note: Post-hoc comparisons were conducted for each epoch using Cohen's d, raw p, and FDR-adjusted p values (Benjamini-Hochberg correction). Asterisks (*) indicate p < .05. FDR adjustments can result in identical adjusted values when smaller p-values are "pulled down" to match larger ones, as is standard for the Benjamini-Hochberg method.

associated with the emotional or sensory experience of a distant, emotionally bonded partner. The primary hypothesis was that a Receiver's physiological state, specifically their "gut feelings" as measured by EGG, would resonate with the emotional state of a distant sender. The results provide nuanced support for this hypothesis. The findings suggested the presence of a "resonance" effect but one different from what was originally assumed, manifesting as a significant change in gastric frequency rather than amplitude.

The central finding of this study was a statistically significant Condition $\times$ Epoch interaction for EGG frequency ($p = 0.048$), indicating that the pattern of change in the Real group differed significantly from that of the Sham group over the course of the experiment. Conversely, no such interaction was found for maximum amplitude ($p = 0.630$). This provides an important refinement for the results reported in the Radin & Schlitz (2005) study. It suggests the effect is not a "jolt" or "tensing" of the gut (an amplitude effect) but rather a change in its fundamental rhythm (frequency).

The LME analysis, which is statistically appropriate for handling subject-level variability and the time-based habituation present in the data, supersedes our original 2005 finding. The LME's detection of a significant main effect of Epoch for amplitude ($p = 0.0125$) confirms that EGG amplitude habituation is a real factor, and by modeling

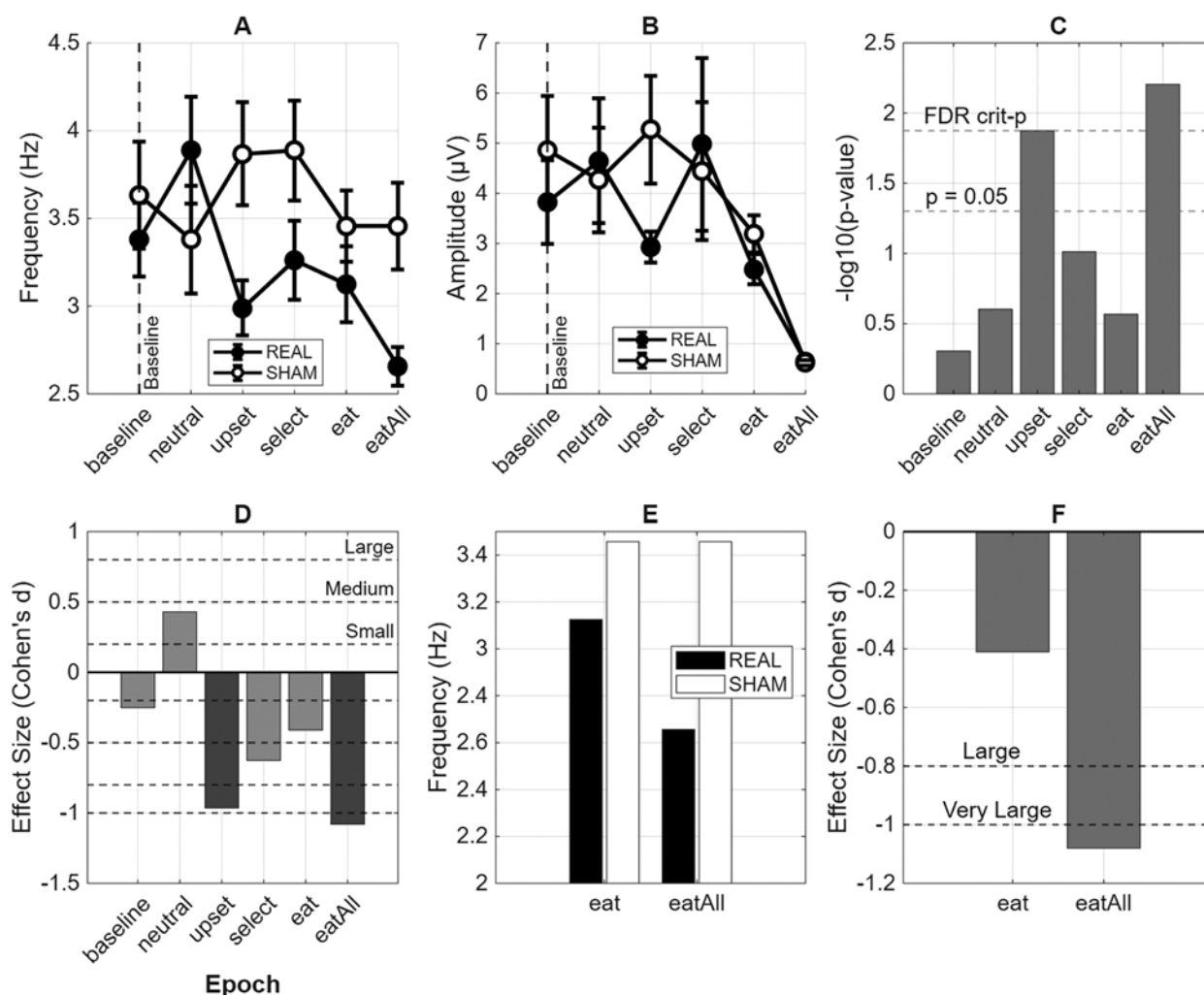


Figure 3. Comparisons of EGG Activity Across Experimental Epochs Over Time, Post-hoc Effect Sizes, and Frequency and Post-hoc Effect Sizes for the First Two Minutes of the Eating Period (“eat”; Consistent with the Other Experimental Epochs) Versus the Entire Eating Period (“eatAll”). *Note:* (A) Frequency trajectory (raw means $\pm$ SEM) across the emotional and food-related epochs in both Real and Sham conditions. (B) Amplitude trajectory (raw means $\pm$ SEM) for the same epochs, showing overall signal magnitude over time. (C) Post-hoc t-test p-values for frequency, illustrating where statistically significant differences occurred across epochs and conditions. (D) Corresponding post-hoc effect sizes (Cohen’s d) for frequency, comparing Real vs. Sham conditions. (E) Comparison of starting to eat and the entire eating epoch, showing mean frequency and amplitude values across the two periods. (F) Post-hoc effect sizes for the “eat” vs. “eatAll” comparison, highlighting the relative magnitude of change between the onset of eating and the entire eating interval.

it, the analysis was able to isolate the underlying frequency effects. Post-hoc analysis of the frequency interaction revealed that this effect was driven by a significant slowing of gut frequency (bradygastria) in the Real group but not the Sham group. This slowing was not present at baseline but became most pronounced during two specific epochs: upset ($p\{\text{FDR adjusted}\} = 0.040$, Cohen’s $d = -0.965$) and the full eating period ($p\{\text{FDR adjusted}\} = 0.0374$, Cohen’s $d = -1.080$).

These physiological responses are key to the proper interpretation of the results. A slowing of the Receiver’s

EGG frequency during these epochs cannot be interpreted as a simple parasympathetic “rest and digest” stabilization, but rather as an index of altered autonomic balance. Bradygastria has been described in the literature under conditions of heightened sympathetic influence that inhibit digestion, yet it can also arise from shifts in parasympathetic (vagal) modulation of gastric pacemaker activity. Thus, the pattern observed here is most parsimoniously understood as a complex, non-mimicking interaction between the Sender and Receiver, rather than a straightforward mirror of classic “rest and digest” or “fight

or flight” states. For example, during the upset epoch, the Receiver’s gut appeared to resonate with the Sender’s sympathetic arousal state, initiating its own sympathetic gut “shut-down” response, whereupon EGG frequency declined. This would be compatible with a “resonance” hypothesis whereby the Receiver “felt” the Sender’s emotion as one of threat or alarm, expressed as a shift in autonomic input to the stomach. Of greater interest, however, was the cumulative effect observed in the Receiver while the Sender was eating. Gastric frequency slowed during the initial 2-minute eating period (Cohen’s $d = -0.410$), and when measured across the entire eating period, the effect size more than doubled to a large Cohen’s $d = -1.080$ and became significant. This suggests the effect of the Real eating stimulation was not merely a brief, transient reaction, but a persistent, cumulative “signal” from the Sender strong enough to modify the Receiver’s gastric pacing over the full epoch.

The significant frequency-based changes observed in this study, without significant corresponding amplitude changes (after FDR adjustment), overall suggest that parasympathetic (vagal) modulation played a primary role, possibly with superimposed sympathetic influences in certain conditions. The vagus nerve’s role as the primary conduit of parasympathetic control of the gut and a central component of gut-brain communication supports this interpretation. A vagally mediated slowing of gastric frequency aligns with our findings, as external vagal nerve stimulation reduces frequency (Teckentrup et al., 2020). Given the well-established physiological sensitivity of EGG frequency to autonomic and enteric modulation, including decreases in dominant frequency during stress (Riezzo et al., 1996), the current findings support the interpretation that the experimental intervention selectively influenced the pacing of gastric myoelectrical activity rather than induced a nonspecific enhancement of signal amplitude. This outcome is notable because EGG amplitude can be influenced by various non-specific factors, including electrode contact, skin conductance, and body motion; thus, its interpretive specificity is lower than that of frequency. Observing a significant frequency shift, especially when amplitude effects were statistically controlled as in this analysis, suggests a relatively direct modulation of enteric neural or myoelectrical control mechanisms. The balance of evidence favors predominantly parasympathetic mediation rather than a purely sympathetic response.

This outcome aligns with prior psychophysiological research indicating that EGG frequency shifts are more reliable indicators of changes in gastric neural control

than amplitude shifts under influences such as attention, arousal, intention, or stress. For instance, Parkman et al. (2003), in their consensus guidelines on EGG methodology, emphasize that amplitude is highly sensitive to confounding factors like body movement and posture, making it difficult to interpret unless tightly controlled. In contrast, frequency is relatively stable and thus more suitable for meaningful comparisons. Similarly, Riezzo et al. (1996) found that different stressors (e.g., cold pressor, Stroop test, and mental arithmetic) consistently decreased dominant frequency and increased its variability, while amplitude rose in only one task and varied widely between individuals. Such findings led those authors to recommend frequency-based metrics in psychophysiological research involving EGG. Gianaros et al. (2001) made the same recommendation after showing that stressors, such as public speaking and mental arithmetic, significantly reduced time spent in normogastria (2–4 cycles per minute), while amplitude-based indices showed no consistent pattern. Wolpert et al. (2020) echoed these findings in an extensive normative study, concluding that amplitude is highly susceptible to external variables (e.g., body fat, electrode placement, breathing), but frequency metrics offer more robust markers for affective state comparisons.

In the present study, the observed decrease in dominant EGG frequency in the Real condition, relative to the Sham condition, may plausibly reflect physiological stress induced by being hungry while intuitively sensing that one’s distant partner was enjoying a meal. As noted above, such a response may be mediated by external vagal stimulation, which is known to decrease EGG frequency, potentially induced in the present case via extrasensory communication. Such a decrease is also consistent with stress-related or motivational arousal responses. From an evolutionary perspective, it is conceivable that early humans may have communicated vital information, such as the location of food, through nonlocal physiological or perceptual mechanisms. In such a scenario, the Receiver’s physiological response might serve as a mobilizing signal, prompting distant group members to sense that a tribe member had found food and to move toward the food source. Moreover, because the Sender could see a live video of the Receiver during Real trials, subtle scopaeesthesia-related arousal cannot be ruled out as a contributing factor. Mild sympathetic activation associated with being observed could theoretically influence Receiver physiology through nonlocal channels. This further underscores the need for a cautious interpretation of autonomic responses.



Our failure to replicate the amplitude-based EGG effects reported by Radin and Schlitz (2005) may be due to specific methodological differences, particularly in role assignment. In the present study, researchers determined Sender and Receiver roles based on optimizing EGG signal quality, which may have conflicted with participants' intuitive inclinations. Indeed, several participants reported feeling they would have performed better in the opposite role, suggesting that allowing self-selection may be important for assessing these effects.

The study also had general limitations that warrant consideration. All participants endorsed a belief in telepathy, which may have enhanced sensitivity to the subtle impacts but limits the generalizability of the results to broader populations. Additionally, while EGG offers a focused view of gastrointestinal rhythms, it does not capture broader autonomic or cortical processes that may also contribute to distant physiological coupling. This is relevant in light of a recent study by Silberstein and Bigelow (2024), who used steady-state visual evoked potentials with event-related phase coherence (SSVEP-ERPC) and observed notable changes in brain connectivity in monozygotic twins, with a Cohen's d of 0.85. This more substantial effect may reflect the greater sensitivity of their neurophysiological measures, the unique closeness of monozygotic twins, or both. Another limitation is that "sad" images, while validated for strong affective and autonomic impact, may not evoke uniform responses across participants; for example, some may experience graveyard scenes as neutral or aesthetically pleasing. Improved sensitivity may be achieved by pre-rating and tailoring emotional stimuli to individual differences in emotional reactivity.

Future studies could refine the present protocol in several ways. Allowing participants to self-select into Sender and Receiver roles may better align with their intuitive strengths and potentially increase effect sizes. In the present study, the skewed role distribution likely contributed to participants' impressions that they might have performed better in the opposite role. In heterosexual participant pairs, all men served as Senders and all women as Receivers, which may have created misalignment with some participants' intuitive or interpersonal strengths. Allowing self-selection in future studies could reduce role-sex mismatch and enable more systematic examination of potential sex-related effects. Adding a semi-structured qualitative debrief would also be valuable, as participants may engage in spontaneous imagery, emotional inferences, or internally generated strategies that could clarify how subtle interpersonal effects unfold. Incorporating

such debriefs in future replications would help contextualize physiological findings and illuminate subjective correlates of any observed coupling. Moreover, examining correlations between the Sender and Receiver regarding EGG amplitude and frequency may yield valuable insights. Finally, a key limitation of the current study design is that EGG alone does not permit definitive attribution of gastric frequency shifts to sympathetic or parasympathetic activity. Future studies should incorporate additional autonomic measures (e.g., such as heart rate variability, skin conductance responses, respiration, electroencephalography, and pupillometry) to derive a clearer profile of the underlying mechanism.

If replicated, these findings suggest that gut physiology may be uniquely sensitive to subtle, nonlocal interpersonal influences, particularly within emotionally bonded pairs. However, this interpretation remains tentative, given the study's exploratory design and analysis, as well as the limited sample size.

In conclusion, the observed decrease in EGG frequency during the Sender's upset and eating experiences indicates that gastric rhythm may be sensitive to subtle interpersonal influences under controlled conditions. However, because both sympathetic and parasympathetic pathways can produce frequency slowing, and because only EGG was collected, the underlying autonomic mechanism cannot be determined at this stage. These results nonetheless contribute to ongoing efforts to map the physiological substrates of nonlocal interpersonal connection.

IMPLICATIONS AND APPLICATIONS

This double-blind, sham-controlled EGG paradigm offers a generalizable template for probing subtle interpersonal coupling across disciplines, using autonomic physiology as an objective bridge between subjective experience and putative nonlocal influence. The condition-specific slowing of the Receiver's gastric frequency during the Sender's sadness and especially during eating suggests that physiological synchrony may emerge most strongly in richly embodied, interoceptive states, motivating applications in affective neuroscience, social psychophysiology, and studies of interpersonal attunement. Methodologically, the linear mixed effects approach to epoch-by-condition interactions can be extended to other peripheral signals, including ECG-derived vagal indices, respiration, skin conductance, and pupillometry, to triangulate mechanisms and test whether vagal pathways mediate the observed effects. Clinically, the

findings motivate interdisciplinary work on gut-brain communication, co-regulation in close relationships, and anomalous information transfer claims, while emphasizing the need for multimodal autonomic measurement to distinguish between parasympathetic and sympathetic contributions.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

ETHICS STANDARDS STATEMENT

All study activities were approved and overseen by the Institutional Review Board at the Institute of Noetic Sciences (IORG#0003743), and the study design was pre-registered with the Koestler Parapsychology Unit (#1095).

AUTHOR CONTRIBUTIONS (CREDIT)

GY: Conceptualization, Funding acquisition, Investigation, Project administration, Writing – original draft; AD: Methodology, Software, Writing – Reviewing and Editing; HW: Project administration, Writing – review and editing; JHL: Investigation, Writing – review and editing; ST: Investigation, Writing – review and editing; MK: Formal analysis; SA: Writing – original draft; RT: Investigation, Writing – review and editing; DR: Conceptualization, Formal analysis, Methodology, Writing – original draft.

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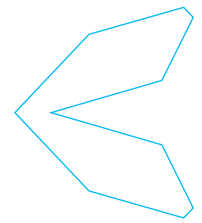
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BRIEF REPORT

The Urban Relict Hominoid: An Analysis of Incursions into Populated Areas

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ABSTRACT

Urban incursions by large, undescribed hominoids have been mentioned in historical literature but rarely examined through a consistent analytical framework. This study reviews 5,834 reports drawn from three public databases and the author's research records to identify observations of putative relict hominoids entering populated areas by ≥ 0.40 km. Forty-two reports met the geographic criterion, and twenty-five (59.5%) met the study's credibility threshold for inclusion. These incursions occurred in areas with a mean population density of 2,118 people/km², exceeding the U.S. city average of 1,600 people/km². Mean incursion depth was 2.83 km, with a maximum of 12.55 km. Seasonal and temporal patterns differed from the John Green and desert-environment datasets, with winter and nighttime incursions predominating. Morphological descriptions also showed an overrepresentation of lightly built individuals. Comparisons with known primates and large mammals suggest several nonexclusive explanations for these reports, including food acquisition, dispersal, exploratory behavior, and responses to anthropogenic landscape change. Because the dataset is based mostly on archival witness reports rather than independently verified biological records, the findings should be interpreted cautiously. Even so, the patterning observed here suggests that urban incursions, while uncommon, are behaviorally structured events that merit further comparative and field-based investigation.

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KEYWORDS

Relict hominoids, urban ecology, cognitive ecology, nocturnal behavior, dispersal.

INTRODUCTION

Reports of relict hominoids entering or approaching populated areas appear in both historical and contemporary accounts, yet systematic evaluation of such events remains limited. Most reports originate in forested or rural settings, but a smaller subset describes movement well inside the urban/undeveloped interface. Examining the ecological and behavioral context of

these incidents may clarify the extent to which such reports reflect adaptability, risk-sensitive movement, and interactions with human-dominated landscapes.

Large mammals such as bears, cougars, coyotes, macaques, baboons, and vervets regularly exploit urban environments under specific ecological conditions. Across these taxa, urban use is often associated with behavioral flexibility, shifts toward nocturnality, and selective use of corridors



that reduce exposure while preserving access to anthropogenic resources (Bateman & Fleming, 2012; Fehlmann et al., 2017; Gaynor et al., 2018). Similar ecological principles may help contextualize reports of relict hominoids in populated areas.

Urban incursions by wildlife are commonly linked to energetic stress, dispersal, exploratory behavior, or access to predictable anthropogenic foods. Primates in particular show context-dependent adjustments in ranging, activity timing, and risk assessment when moving through human-modified landscapes, including crop-raiding and movement beyond protected-area boundaries (Naughton-Treves et al., 1998; Priston & Underdown, 2009). These responses often rely on spatial memory, flexible decision-making, and the capacity to integrate recurring features of human activity into movement patterns.

This study evaluates reports of putative relict hominoids entering populated areas by ≥ 0.40 km, examines their spatial and temporal patterning, and interprets those patterns within established literature on wildlife urban ecology, primate behavior, and cognitive ecology. By comparing the reported patterns with those documented in known large mammals and great apes, the analysis asks whether urban incursions are more consistent with incidental proximity, environmental displacement, or patterned, risk-sensitive movement.

Recent work in animal cognition emphasizes that urban environments function not only as ecological spaces but also as cognitive landscapes that animals must interpret and negotiate (Sol et al., 2020). Large-brained species often persist in such settings through behavioral flexibility, a central idea in the Cognitive Buffer Hypothesis, which proposes that enhanced cognitive capacity can improve performance under novel or fluctuating conditions (Overington et al., 2011). Urban exploiters, including corvids, macaques, coyotes, and raccoons, frequently rely on problem solving, inhibitory control, and spatial memory when navigating anthropogenic risks and opportunities. In this study, that literature serves as a comparative framework rather than as direct evidence of cognition in an undescribed taxon.

Definition of Relict Hominoids

Anthropologist D. Jeffrey Meldrum defined the term relict hominoid within a biological and paleoanthropological context as “surviving representatives of ancient hominin or hominoid lineages that have persisted into modern times” (Meldrum, 2012). Meldrum’s usage highlights bipedalism,

hominoid ancestry, and the possibility that small, low-density populations of archaic primates may remain extant but unclassified because of their elusiveness and the challenges of documenting rare, wide-ranging species.

In this study, the term relict hominoid is used in this biological sense: a hypothesized, extant, non-*Homo sapiens* bipedal primate representing a surviving lineage of ancient hominoids or hominins, inferred from observational, morphological, and behavioral evidence.

Taxonomic Clarification

The term hominoid is used in its formal biological sense to refer to all members of the superfamily *Hominoidea*, which includes the lesser apes (family *Hylobatidae*) and the great apes and humans (family *Hominidae*). Within *Hominidae*, the subfamily *Homininae* comprises gorillas, chimpanzees, bonobos, and humans. The tribe *Hominini* includes the genera *Homo* and *Pan*, while the subtribe *Hominina* refers specifically to humans and our extinct close relatives.

The term hominid, historically used to refer exclusively to humans and their fossil ancestors, is now taxonomically broader and encompasses all great apes and humans. By contrast, hominin refers specifically to humans and all species more closely related to humans than to chimpanzees. The phrase relict hominoid, as used in this paper, therefore denotes a hypothesized extant member of *Hominoidea* potentially within or adjacent to the hominin lineage that persists as a surviving representative of an ancient hominoid or hominin clade.

QUALITY CONTROL AND METHODS

Data Source Descriptions

Archival reports spanning multiple decades were evaluated, with historical volume fluctuating over time and reaching a peak during the 2006–2015 decade (Figure A1). A total of 5,834 reports of relict hominoid observations were reviewed from three public databases (BFRO, ORBF, and BFTimes) and the author’s personal research archive (Bigfoot Field Researchers Organization, n.d.; Oregon Bigfoot, n.d.; Perez, 2022). These materials comprise witness-submitted, investigator-reviewed, editorially curated, or author-collected accounts. For the purposes of this study, they were treated as archival witness reports rather than as independently verified biological occurrences. The author conducted an initial screening for location specificity and duplication across sources, followed by a second screening for the urban-incursion threshold. Reports that

remained were then subjected to a third-pass credibility assessment before inclusion in the final dataset.

Reports were screened for duplication, geographic specificity, temporal detail, observer credibility, and descriptive clarity. Only reports containing sufficient information to estimate location, approximate distance from the urban/undeveloped interface, and basic morphological or behavioral descriptors were retained for further evaluation. Spatial and temporal patterns were then compared with the author's desert relict hominoid dataset (Champagne, 2018) and researcher John Green's archival dataset.

John W. Green's (1927-2016) database of relict hominoid reports remains an important archival resource. Green, an early researcher and author, maintained a spreadsheet database of collected reports, and although the original file is not currently available, derivative versions remain accessible online. The Green archive contains 4,068 sighting reports from 1800-2000. John Green's original Sasquatch database was formerly available through sasquatchdatabase.com; a searchable derivative version is currently available through *John Green and More* at <https://sasquatch.mkrejci.com/> (Krejci, n.d.).

The largest source reviewed was the North American geographic database maintained by the Bigfoot Field Researchers' Organization (BFRO), which contained 5,572 reports spanning approximately 1904-2024. The database is organized geographically by state or province and then by county or borough. The BFRO classifies reports as Class A (clear sightings with comparatively high confidence), Class B (plausible but less certain observations), and Class C (secondhand or otherwise low-confidence reports).

A second online U.S. database, Oregonbigfoot.com (ORBF), was also reviewed for qualifying reports. This resource contains approximately 1,465 reports, similarly organized by state and county, and covers a roughly comparable historical period. Two additional observations were included from other sources: one collected by the author (Ref. #US41) and one collected by researcher Daniel Perez (BFTimes; Ref. #US8).

Inclusion Distance Threshold

A minimum distance of 0.40 km inside the urban/undeveloped interface was required for a report to be classified as an urban incursion. This threshold was intended to exclude incidental edge use and is broadly consistent with wildlife-ecology studies showing that edge effects often extend approximately 200-500 m into adjacent habitat (Villaseñor et al., 2014). Movements within that zone

can reflect transitional or boundary-skimming behavior rather than interior habitat use. Studies of large mammals, including black bears, coyotes, and primates, suggest that movements beyond 200-300 m are more often associated with foraging, dispersal, or exploratory behavior than with accidental proximity (Beckmann & Berger, 2003; Lowry et al., 2013; Riley et al., 2003; Sha & Hanya, 2013). The 0.40 km threshold is therefore used here as a conservative screening criterion, not as a definitive ecological boundary.

Credibility Assessment

A credibility assessment was used because the study concerns rare, contested, and observationally difficult events. In this context, a structured screening process helps distinguish reports that contain enough descriptive and contextual detail for comparative analysis from those that do not. The scoring system does not verify species identity or establish biological proof; rather, it provides a transparent method for ranking report quality on the basis of investigator review, observer qualifications, descriptive specificity, and the presence of corroborating information.

The main strength of this approach is procedural consistency: all candidate reports were evaluated using the same stated criteria, reducing ad hoc inclusion decisions and making the screening process easier to scrutinize. At the same time, the method has important limitations. Any credibility score applied to witness reports retains a degree of subjectivity, and stronger documentation may reflect reporting circumstances rather than underlying event quality. The procedure may therefore exclude genuine but poorly documented incidents while retaining detailed reports that are nevertheless mistaken. Reporting bias, uneven investigator involvement, and variable record quality across source databases further limit inference. Accordingly, the scoring system should be understood as a tool for comparative dataset construction, not as independent validation of the underlying phenomenon.

Each report was evaluated using a structured credibility scoring system (maximum score: 11 points). Points were assigned based on:

- qualified investigator review
- observer qualifications
- descriptive detail
- observer credibility
- presence of multiple witnesses
- observation duration ≥60 seconds
- observation made within 200 m
- physical evidence (i.e., impressions, vegetation disturbances- 2 pts.)

- photographic, video, or audio documentation
- associated biogenic structures (i.e. nests, bedding areas, tracks, feeding/foraging² traces)

A minimum score of 5 points was required for inclusion. This threshold was selected to balance rigor with retention of analyzable cases and to exclude reports lacking sufficient descriptive support for spatial and behavioral comparison. It should be interpreted as a practical screening cutoff within this study design rather than as a standalone demonstration of statistical significance (See Figure 1).

Geospatial Analysis

Distances from the urban/undeveloped interface were estimated using GIS tools and checked against satellite imagery. When precise coordinates were unavailable, conservative estimates were derived from described landmarks, road intersections, or other identifiable geographic features. Population-density values were obtained from U.S. Census Bureau sources and municipal demographic records.

Temporal and Seasonal Classification

Seasonal categories followed standard climatological divisions. Time-of-day bins were based on common wildlife-activity windows.

Morphological Classification

Morphological descriptions were grouped into three body-build classes: massive, medium, and light.

Final Dataset

Of the 5,834 reports reviewed, 42 met the geographic criterion, and 25 met the credibility threshold. All subsequent analyses are based on those 25 reports.

Population Density

The included incursions occurred in areas with a mean population density of 2,118 people/km², higher than the reported U.S. city average of 1,600 people/km². This pattern indicates that the selected cases were not limited to low-density peri-urban settings (Figure 2).

Depth of Incursion

Incursion depth ranged from 0.40 to 12.55 km, with a mean of 2.83 km (Figure 3).

Seasonal Distribution

Winter accounted for the largest share of incursions (36%), followed by autumn (27%), summer (23%), and spring (14%) (Figure 4). In addition to the seasonal

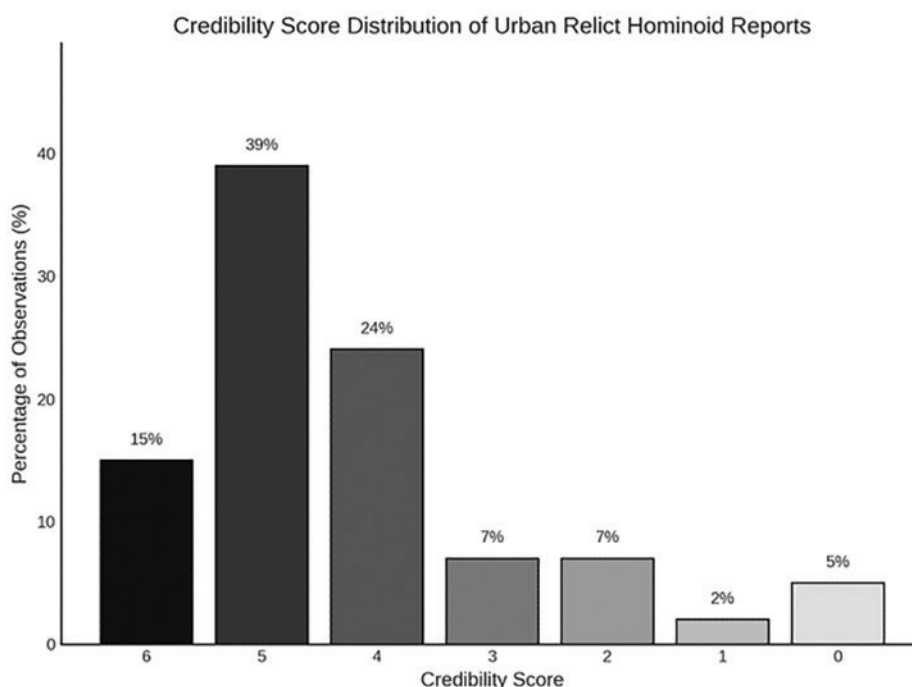


Figure 1. Credibility score distribution. Percentage of reports assigned a credibility score (0–6), with score 5 representing the modal category.

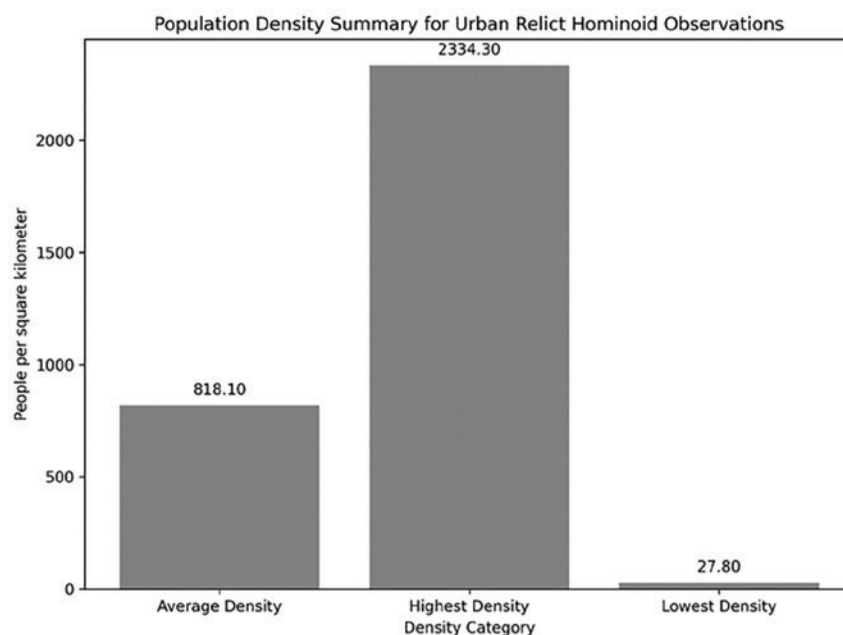


Figure 2. Population density of reporting regions (people per km²). Minimum, maximum, and mean human population densities associated with the included observation sites are shown.

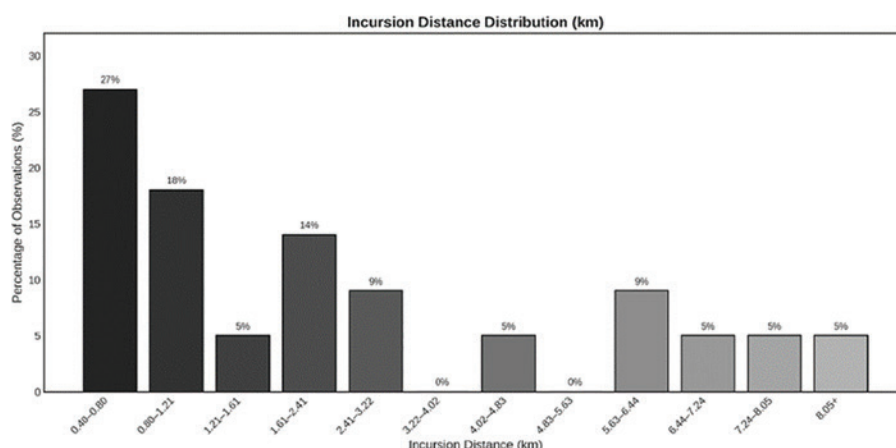


Figure 3. Incursion distance distribution (km). The figure shows the percentage of observations within each distance band inside the urban–undeveloped interface.

frequency of incursions, reported physical dimensions varied across the year, with autumn observations yielding the highest average reported height (Figure A2).

Temporal Distribution

Most incursions were reported during nighttime hours, indicating a pronounced nocturnal bias in the final dataset (Figure 5).

Morphological Descriptions

Reported body-build categories were massive (40%), medium (13%), and light (20%), with lightly built individuals

appearing more frequent than expected relative to broader sighting datasets (Figure 6).

Geographic Distribution

The 25 included incursions were distributed across 14 U.S. states, with the highest concentrations in Illinois, Ohio, Utah, New Jersey, and Colorado.

Behavioral Observations

Commonly reported behaviors included rapid movement, apparent avoidance of humans, use of linear corridors, and limited vocalization.

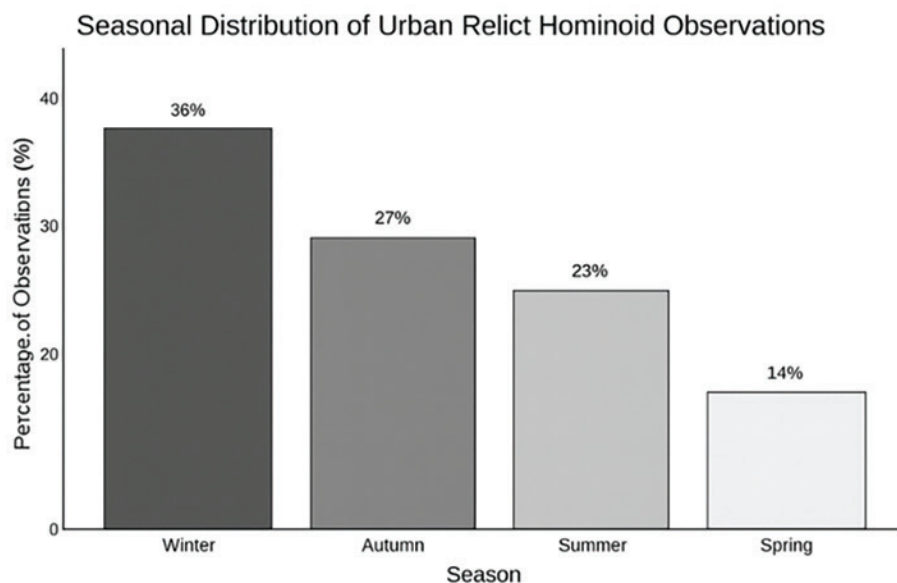


Figure 4. Seasonal distribution of incursions. Winter comprised the largest proportion of reports in the final dataset.

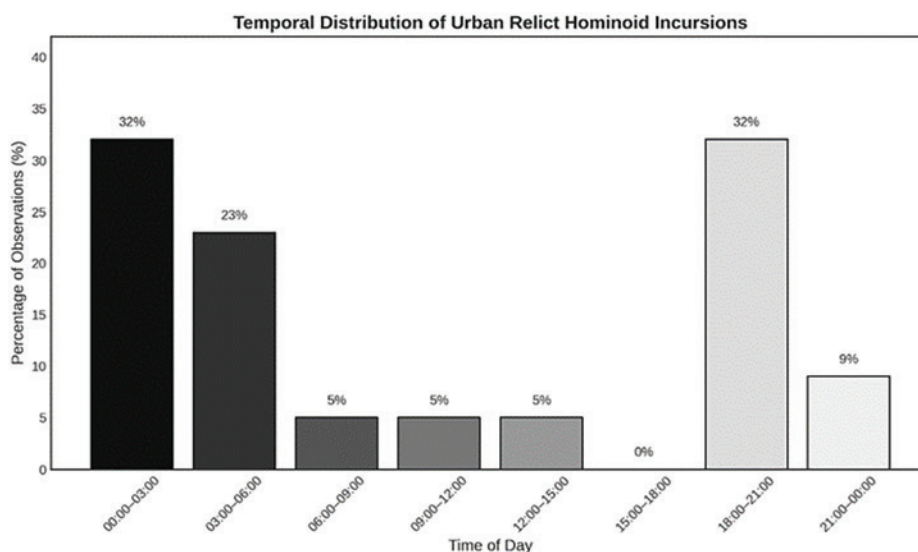


Figure 5. Temporal distribution of incursions. Observations are grouped into eight 3-hour intervals, with peaks at 00:00–03:00 and 18:00–21:00.

DISCUSSION

Intelligence and Behavioral Flexibility

The behavioral patterns documented in this dataset are consistent with a degree of behavioral flexibility comparable to that seen in other large-brained mammals, particularly great apes and adaptable carnivores. The strong nocturnal bias, apparent use of urban corridors, and repeated movement into populated areas suggest patterned risk-sensitive behavior rather than uniformly random movement. Comparable temporal adjustments and route selection have been

documented in urban macaques, baboons, leopards, and coyotes, all of which modify activity in response to human disturbance gradients. In the present study, those comparisons are interpretive rather than taxonomic: they help frame the observed patterning but do not establish equivalence in cognition or confirm species identity.

These behavioral signatures are broadly compatible with the Cognitive Buffer Hypothesis, which links larger brains and behavioral flexibility to improved performance in novel or human-modified environments (Sol et al., 2005). Species that persist in urban settings often do so by shifting

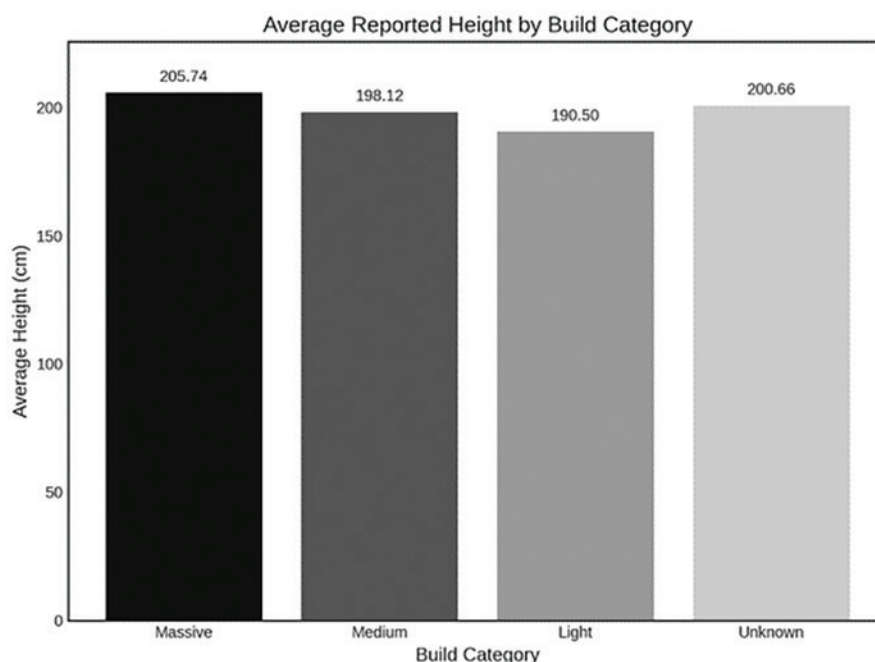


Figure 6. Average reported height by body-build category (cm), based on observer-reported body-build descriptions.

activity timing, modifying foraging strategies, and using spatial memory to reduce exposure to risk. The nocturnal, corridor-based movements documented here fit that general ecological pattern. However, because the present dataset is based on witness reports, any inference about cognition must remain provisional and should be treated as a hypothesis generated by the patterning in the reports rather than as a demonstrated property of a verified species.

Movement through complex urban environments, often at night, across multiple kilometers, and with limited reported detection, may be consistent with the use of spatial memory, route familiarity, and sensitivity to human presence. These possibilities align with cognitive domains documented in primates, including mental mapping, flexible foraging, context-dependent risk assessment, and dispersal-related movement costs (Isbell & Van Vuren, 1996). The apparent overrepresentation of lightly built individuals may also be compatible with dispersal-age exploration. However, because these inferences are drawn from witness narratives, they should be treated as provisional interpretations rather than demonstrations of species-level cognition.

Cognitive Ecology Implications

The ecological and behavioral signatures described here may have implications for how such reports are interpreted within cognitive ecology. First, the reported patterns

suggest possible sensitivity to human activity cycles, seasonal resource conditions, and landscape structure. If those patterns reflect actual behavior, they would be consistent with dynamic risk assessment similar to that reported in great apes navigating fragmented or human-modified habitats (McLennan & Hill, 2010; Meijaard et al., 2010).

Urban-cognition research distinguishes between species for which cities function as cognitively demanding problem spaces and those for which urban environments operate as comparatively accessible niches exploitable through preexisting adaptations (Griffin et al., 2017). Within that framework, the reported incursions may be interpreted not as evidence of novel cognitive evolution, but as the possible redeployment of ancestral capacities such as spatial memory, exploratory behavior, and context-sensitive risk assessment in anthropogenic settings.

Second, the reported use of linear landscape features such as riparian zones, greenbelts, rail lines, and drainage systems may indicate sensitivity to predictable structural elements within human-modified environments. Comparable corridor-based movement has been documented in bears, wolves, coyotes, bobcats, and some primates and is commonly associated with spatial familiarity and risk reduction (Beckmann & Berger, 2003; Riley et al., 2003; Sha & Hanya, 2013).

Third, the predominance of apparently solitary incursions may suggest that some events depend more on

individual experience than on overt group coordination. This pattern is broadly comparable to taxa that show high individual variation in ranging strategies and reliance on personal landscape knowledge (Chow et al., 2021).

Finally, the combination of nocturnality, deeper incursions, and apparent avoidance of high-traffic periods is consistent with risk-sensitive adjustment to human presence and broader patterns of behavioral adjustment in urban environments (Gaynor et al., 2018; Sol et al., 2020). In this study, that pattern is best treated as a comparative ecological signal rather than as direct evidence of advanced cognition.

Comparison to Great Ape Models

Orangutans (Pongo Spp.)

Orangutans exhibit solitary ranging, extensive reliance on spatial memory, and the capacity to move through fragmented landscapes. Those traits provide a useful comparative model for interpreting the deep, apparently solitary incursions in this dataset, particularly because orangutan conservation studies emphasize the need to interpret great-ape persistence within complex human-modified landscapes (Meijaard et al., 2010). The comparison is heuristic rather than taxonomic.

Gorillas (Gorilla Spp.)

Gorillas show sophisticated risk assessment in human-modified landscapes, and dispersal-driven exploration by subadult males offers a useful analog for the apparent overrepresentation of lightly built individuals in this dataset. At the same time, gorillas are generally less solitary and less nocturnal than the pattern described here, making the comparison useful but limited within broader primate social-system theory (van Schaik & van Hooft, 1983).

Chimpanzees (Pan troglodytes)

Chimpanzees are often cited for their high degree of behavioral flexibility, including flexible movement, foraging adjustment, and sensitivity to changing social and environmental conditions. Studies of chimpanzees in disturbed forest–farm mosaics show that great apes may alter responses to humans and researchers in human-modified landscapes (McLennan & Hill, 2010). Although the present dataset provides no direct evidence of tool use or social coordination, the reported alignment of movement with human rhythms is broadly comparable to forms of environmental responsiveness documented in chimpanzees and other cognitively flexible mammals.

Synthesis

Taken as analogical models, orangutans, gorillas, and chimpanzees provide useful comparative frameworks for interpreting reported navigation, dispersal-like movement, and behavioral flexibility in the present dataset. These analogies help situate the observed patterning within primate behavioral ecology, including broader theories about the ecological and social drivers of primate social systems (van Schaik & van Hooft, 1983), but they do not justify direct claims of equivalence in intelligence or taxonomic affinity.

Individual-Level Cognitive Variation

A growing body of research suggests that urban exploitation is often driven by individual-level behavioral variation, with only a subset of animals regularly entering human-dominated areas (Chow et al., 2021). This framework is relevant to the apparent overrepresentation of lightly built, possibly dispersal-age individuals in the present dataset. If that pattern is reliable, it may indicate that urban entry reflects not only species-level flexibility but also within-population differences in exploratory behavior and risk tolerance.

Behavioral-Cognition Model for Urban Incursions

Perception and Environmental Assessment

- Detection of anthropogenic cues (light, noise, scents, etc.)
- Assessment of human activity levels
- Recognition of safe vs. high-risk zones

Spatial Memory and Route Planning

- Long-term memory of landscape features
- Identification of low-exposure corridors
- Multi-kilometer nocturnal navigation
- Avoidance of bottlenecks and high-traffic areas

Risk-Sensitive Temporal Adjustment

- Nocturnal movement to reduce detection
- Seasonal timing aligned with energetic stress
- Avoidance of daylight and peak human activity

Motivational Drivers

- Energetic stress (winter scarcity)
- Dispersal-related exploration
- Curiosity and environmental sampling
- Resource assessment

Behavioral Flexibility and Decision-Making

- Context-dependent movement
- Individual variation
- Solitary decision-making
- Adaptive responses to human presence



Outcome: a pattern of rare, apparently intentional, largely solitary, nocturnal, corridor-based incursions that may be consistent with flexible decision-making under human disturbance.

Taken together, these perspectives place the reported incursions within a broader framework that integrates urban ecology, cognitive ecology, and individual behavioral variation (Griffin et al., 2017; Lowry et al., 2013; Overington et al., 2011). The recurring pattern of solitary nocturnal movement, selective corridor use, deep entry into populated areas, and possible overrepresentation of dispersal-age individuals is consistent with flexible, context-dependent responses to human-modified landscapes. At the same time, the evidentiary base remains indirect. The most defensible conclusion is therefore not that the reports prove a particular taxon or level of cognition, but that the dataset contains nonrandom ecological structure warranting further comparative analysis and more direct field-based methods.

CONCLUSION

This study identified a small subset of archival reports describing putative relict hominoid movement well inside populated areas. Within that subset, the mean incursion depth of 2.83 km and the maximum of 12.55 km extend beyond what would typically be considered incidental edge use. The reports also show a strong nocturnal bias, a winter peak, and frequent association with linear landscape features, patterns that resemble risk-sensitive movement strategies documented in other large mammals living near people.

The apparent overrepresentation of lightly built individuals may be compatible with dispersal-age exploration patterns seen in primates and carnivores, and the timing of many reports may indicate avoidance of daylight and periods of higher human activity. Even so, these interpretations remain inferential because they are derived from witness narratives rather than direct biological observation. The study therefore supports a more limited conclusion: if the included reports are treated as analyzable behavioral records, they display recurring ecological structure rather than a random collection of anecdotal events.

The principal limitations of the study are its reliance on human observation, uneven documentation quality, possible reporting and selection biases, and the absence of independent biological verification. Those limitations constrain the strength of any taxonomic or cognitive claims. Nevertheless, the consistency of several spatial and temporal

signatures across geographically diverse cases suggests that the reports are suitable for cautious comparative analysis. Future progress will depend less on further anecdotal accumulation than on targeted field methods, standardized screening protocols, and efforts to test whether the reported patterns can be corroborated through independent environmental evidence.

FUTURE RESEARCH DIRECTIONS

Future research and directions should prioritize methods capable of reducing dependence on anecdotal testimony and improving reproducibility. Particularly important next steps include environmental DNA (eDNA) sampling, GIS-based corridor modeling, passive acoustic and thermal monitoring, comparative behavioral analysis, longitudinal monitoring of recurrent hotspots, integration of historical and Indigenous knowledge, machine-learning review of large report databases, and non-invasive field approaches designed to test specific behavioral predictions. Together, these approaches would help determine whether the patterns identified here can be independently replicated and biologically substantiated.

1. Environmental DNA (eDNA) sampling
2. GIS-based corridor modeling
3. Passive acoustic and thermal monitoring
4. Comparative behavioral studies
5. Longitudinal monitoring of hotspots
6. Integration of historical and Indigenous knowledge
7. Machine-learning analysis of report databases
8. Non-invasive behavioral-cognition field experiments

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APPENDIX

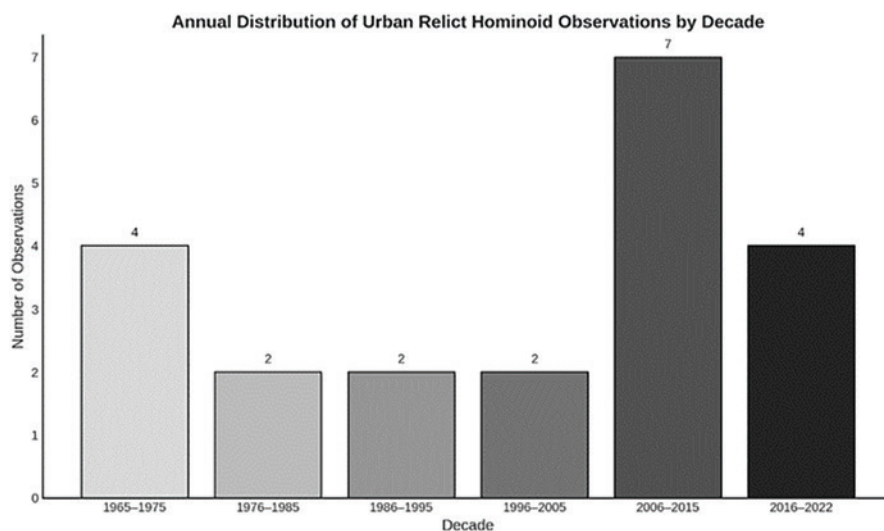


Figure A1. Annual distribution of observations by decade. Counts of reported urban relict hominoid incursions from 1965 to 2022 show the highest frequency during 2006–2015.

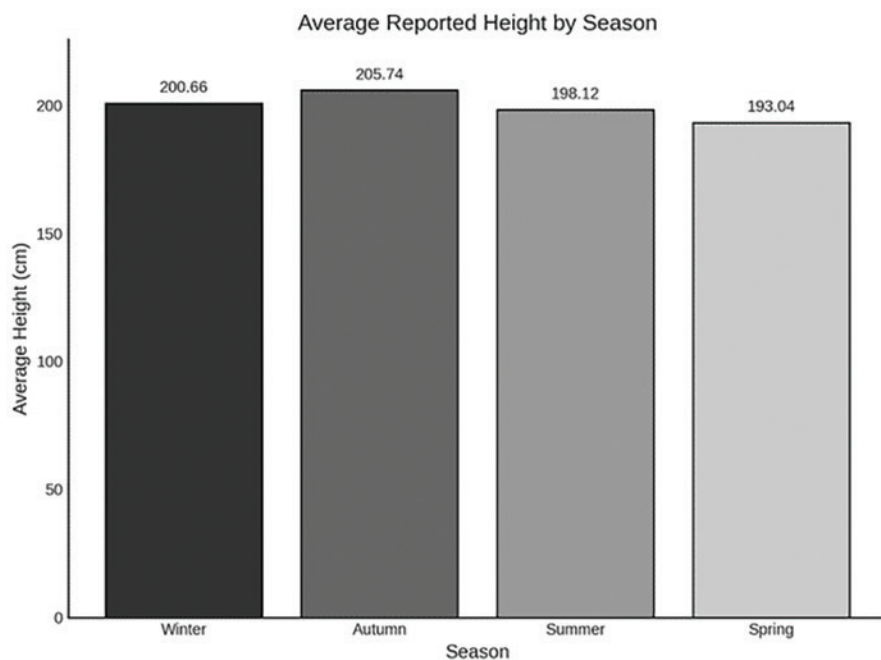
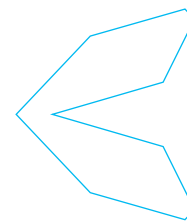


Figure A2. Average reported height by season (cm), based on converted metric averages. Autumn reports show the highest mean height.



ESSAY

Anomalous Luminous Phenomena, Plasma Consciousness, and The Quantum Vacuum: Towards a Unified Framework for Interactive Plasma Phenomena, Non-Local Information Transfer, and the Physics of Consciousness

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ABSTRACT

Anomalous luminous phenomena (ALP) — long-duration plasma spheroids documented most systematically at Hessdalen, Norway — exhibit physical properties that conventional plasma physics cannot adequately explain such as sustained self-confinement for tens of minutes, periodic pulsation, multi-chromatic emission, and a documented responsiveness to laser stimulation bearing the hallmarks of an intelligent reaction rather than a passive optical interaction. This paper proposes a unified conceptual and partially mathematical framework built on three interlocking hypotheses. The Intelligent Plasma Hypothesis (IPH) argues that plasma balls can acquire a quantum-coherent internal structure functionally analogous to neuronal microtubule networks, satisfying the conditions of the Penrose–Hameroff Orchestrated Objective Reduction (OrchOR) theory. The Quantum Brain Analogy for Plasmas (QBAP) extends the OrchOR collapse criterion to a plasma substrate, yielding a plasma consciousness parameter $\Xi \approx 10^3$ for Hessdalen conditions. The Big Library Hypothesis (BLH) grounds a non-local cosmic information field in Bohm's quantum potential and the zero-point energy field of the quantum vacuum. A falsifiable multi-instrument experimental protocol is presented, together with astrobiological implications.

KEYWORDS

Anomalous light phenomena, Hessdalen, plasma confinement, quantum coherence, OrchOR, Penrose–Hameroff, quantum vacuum, zero-point energy, non-local information, plasma-based life, consciousness, Bohm implicate order, SETI.

INTRODUCTION: WHY PLASMA AND CONSCIOUSNESS BELONG IN THE SAME CONVERSATION

There is a longstanding, and in many ways understandable, reluctance to discuss plasma physics and the theory

of consciousness in the same breath. The two fields operate on vastly different scales, deploy different mathematical languages, and have historically attracted very different communities of researchers. Yet there are reasons — some empirical, some theoretical, and some simply a matter of following the evidence wherever it leads — why



bringing them into contact may be not only permissible but necessary.

The empirical reason begins in a narrow Norwegian valley. Since 1984, the Hessdalen Valley in central Norway has been the site of one of the most sustained and methodologically careful investigations of anomalous luminous phenomena (ALP) in scientific history. Over four decades, instrumented field campaigns — equipped with cameras, spectrometers, radar, magnetometers, and eventually high-speed photometers — have documented thousands of events in which self-luminous plasma spheroids appear at low altitude, sustain themselves for periods ranging from minutes to an hour, pulsate with measurable periodicities, and on one occasion react to laser stimulation in ways that resist explanation by any known photon-plasma interaction mechanism (Strand, 1984; Teodorani, 2004). These are not anecdotal sightings. They are quantified physical events, and they leave behind an empirical residue that physics has not yet digested.

The theoretical reason follows from developments in quantum physics that have accumulated over the past three decades. The demonstration of quantum nonlocality (Bell, 1964; Aspect et al., 1982), the elaboration of the Penrose–Hameroff OrchOR theory of consciousness (Penrose, 1994; Hameroff & Penrose, 1996, 2014), and the growing body of work on quantum coherence in biological systems (Engel et al., 2007; Lambert et al., 2013) have collectively dismantled the assumption that quantum mechanics is confined to the microscopic domain. The quantum vacuum — the ground state of all quantum fields, seething with zero-point fluctuations — has been potentially identified as an informationally rich medium of cosmological extent, a fact that carries consequences far beyond laboratory physics.

The present paper weaves these threads together. It develops three hypotheses — the Intelligent Plasma Hypothesis (IPH), the Quantum Brain Analogy for Plasmas (QBAP), and the Big Library Hypothesis (BLH) — each of which is grounded in established physics but each of which points beyond it. The paper argues its case through sustained reasoning, uses mathematics only where it sharpens rather than replaces the argument, and is explicit about what remains speculative. The goal is not to claim that plasma balls are conscious in the full philosophical sense, but to show that the physical conditions for something resembling proto-consciousness are satisfied in these systems, and to propose how that claim might be tested.

The Hessdalen Phenomenon: An Empirical Baseline

Any serious theoretical discussion must begin with the data. The Hessdalen lights are not a single, poorly described anomaly but a rich, multi-parameter dataset accumulated over forty years of scientific observation. Their principal physical characteristics are well-established and worth stating with precision, because they are the empirical constraints that any adequate theory must satisfy.

The phenomena appear as self-luminous spheroids ranging from roughly thirty centimetres to ten metres in diameter, hovering at altitudes from ground level to about two hundred metres above the valley floor, predominantly near geological fault lines rich in piezoelectric minerals (Devereux, 1982). Their continuum spectra are consistent with a partially ionised plasma at electron temperatures of the order of ten thousand Kelvin. Normally their luminance can reach values comparable to a searchlight, but in some cases it can be much higher. What most distinguishes them from any known variety of ball lightning is their duration: while ball lightning events typically last a fraction of a second to a few seconds at most, Hessdalen events routinely persist for ten to sixty minutes — three to five orders of magnitude longer (see Figure 1). No classical plasma physics mechanism of confinement explains this discrepancy (Teodorani, 2004, 2008).

The pulsation behaviour is equally arresting. A significant fraction of events exhibit semi-periodic changes in luminosity with periods ranging from a tenth of a second to half a minute. These pulsations are not random thermal fluctuations; they are sufficiently regular to be analysed by standard time-series methods, and they show harmonic structure that suggests an organised internal oscillation rather than random noise. High-speed photometry at ten thousand frames per second might reveal, in future observations, sub-millisecond structure in some events (Teodorani, 2024), indicating physical processes operating on time scales far shorter than the overall event duration.

Most theoretically significant is what this author has termed the reaction signature. In multiple field campaigns at sites in the world where similar phenomena occur, directing a low-power laser beam — or even a powerful hand torch — at an active plasma ball reliably elicits a response: the pulsation frequency shifts, sometimes doubling or halving within seconds; the luminance changes abruptly; the sphere may divide into two or more secondary spheroids; and in some cases the object alters its trajectory (see Figure 1). These reactions are reproducible,

Figure 1. Magnetically self-confined ALP: structure and reaction signature

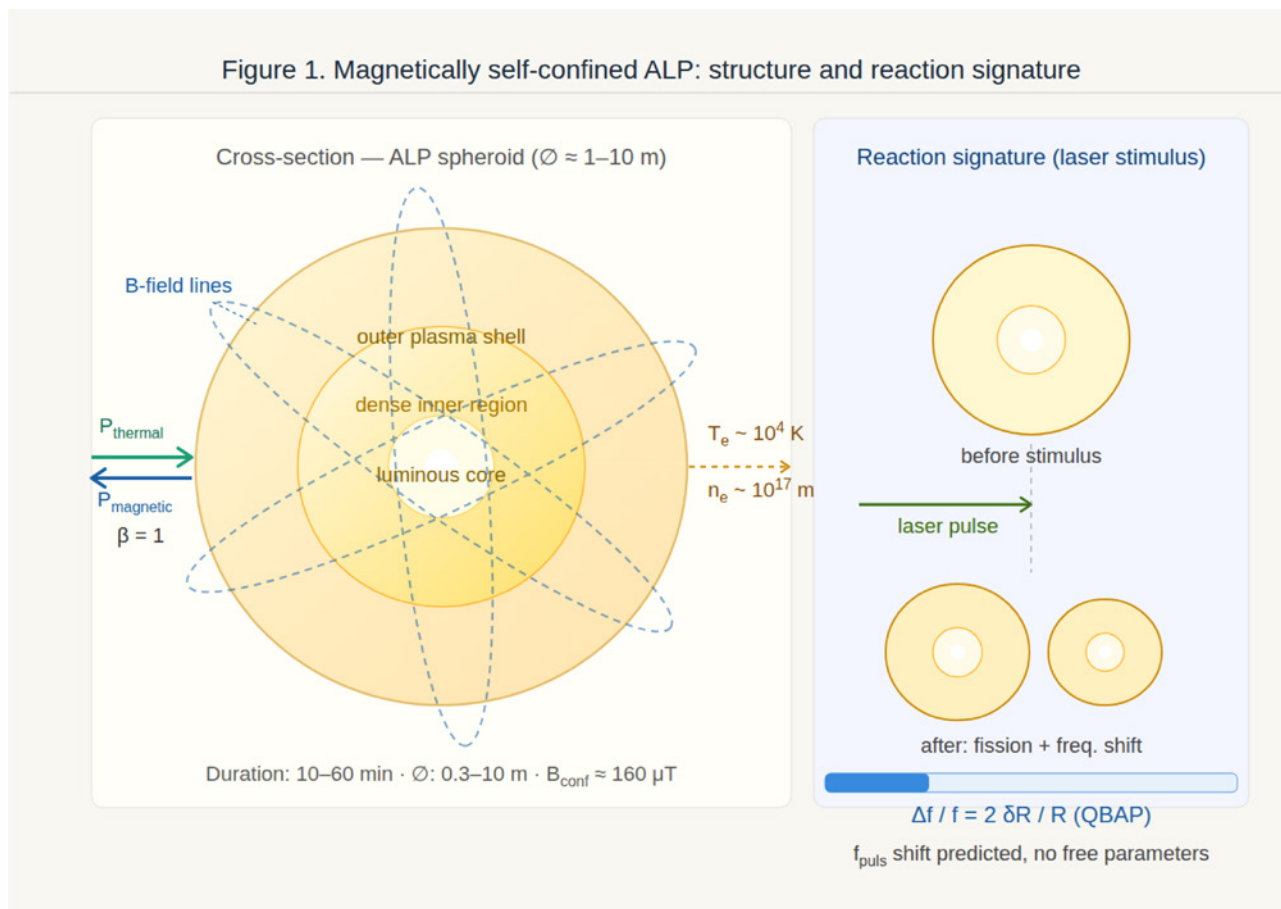


Figure 1. Schematic Cross-Section of a Magnetically Self-Confined ALP (Left Panel). Thermal pressure (P_{thermal} , outward) is balanced by the inward magnetic pressure (P_{magnetic}) at the force-free equilibrium condition $\beta = 1$, requiring a confining field $B_{\text{conf}} \approx 160 \mu\text{T}$ — consistent with geomagnetic anomalies measured in the Hessdalen Valley. Dashed ellipses represent toroidal B-field lines. Plasma parameters derived from Hessdalen spectroscopic records: electron temperature $T_e \sim 10^4 \text{ K}$, electron density $n_e \sim 10^{17} \text{ m}^{-3}$. Right panel: the reaction signature. A single spheroid (before stimulus) undergoes fission into two secondary spheroids with a simultaneous pulsation frequency shift after a laser pulse of negligible energy density, consistent with the QBAP prediction $\Delta f/f = 2\delta R/R$ (see text).

have been documented by independent observers (Strand, 1984), and cannot be attributed to simple photon pressure or thermal effects at the beam intensities involved. The energy deposited by a one-milliwatt laser on a plasma ball is negligible compared to the ball's own electromagnetic energy budget; the reaction must therefore be mediated by a mechanism that amplifies a weak perturbation — which is precisely the hallmark of a coherent, quantum-mechanical system responding to an external trigger rather than a classical gas responding to a heat source (Teodorani, 2025).

It is this reaction signature, more than anything else, that motivates the hypotheses developed in this paper. A system that responds in a structured, reproducible, and apparently information-sensitive way to a weak stimulus seems, by any reasonable functional definition, to behave intelligently. Whether that intelligence is accompanied by

subjective experience — whether there is, in the philosopher's phrase, something it is like to be a Hessdalen light — is a question that the present framework approaches but cannot fully answer. What it can do is specify the physical conditions under which such experience would be possible, and propose experiments to test whether those conditions are met.

The Confinement Problem and Its Magnetic Solution

Before asking whether plasma can be conscious, we must ask how it can persist long enough for consciousness to be relevant. The confinement problem is therefore the physical foundation on which everything else rests.

An unconfined plasma ball at the temperatures characteristic of Hessdalen events would expand and dissipate

within a fraction of a second, driven by thermal pressure. The relevant time scale is set by the ratio of the ball's radius to the thermal velocity of its electrons — a number of the order of microseconds to milliseconds depending on the parameters. Observed events last thousands to millions of times longer than this. Something must be holding the plasma together.

The most natural candidate is a self-organised magnetic field. Magnetohydrodynamics (MHD) — the physics of conducting fluids in electromagnetic fields — provides a well-understood mechanism for plasma confinement through what is called a force-free equilibrium: a state in which the outward thermal pressure of the plasma is exactly balanced by the inward magnetic pressure (see Figure 1). This balance is quantified by the plasma beta parameter, defined as the ratio of thermal to magnetic pressure. When this ratio equals unity, the two pressures cancel and the plasma is in equilibrium. Setting the observed plasma parameters into the relevant equations yields an equilibrium magnetic field strength of approximately one hundred and sixty microtesla — a value that falls comfortably within the range of local magnetic anomalies measured in the Hessdalen Valley, which can reach several hundred nanotesla above the ambient geomagnetic background of around fifty microtesla. The numbers, in other words, are consistent. The plasma balls of Hessdalen could in principle be magnetically self-confined structures, with the confining field generated by current-carrying channels in the ionised rock and fault structures below (Teodorani, 2004; Vargemezis et al., 2024).

The macroscopic pulsation behaviour can be understood within the same framework. Just as a guitar string has a natural resonant frequency determined by its tension and length, a magnetically confined plasma sphere has characteristic oscillation modes determined by its size and field strength. The relevant velocity scale is the Alfvén speed — the speed at which magnetic disturbances propagate through the plasma — and the natural period of oscillation is approximately the time it takes an Alfvén wave to traverse the sphere. For a sphere of one metre radius in a field of one hundred and sixty microtesla, this comes to a few milliseconds. The observed pulsation periods of seconds arise from nonlinear modulation of this basic oscillation — a well-known phenomenon in laboratory plasma physics called sawtooth instability. This physical interpretation connects the observable pulsation directly to measurable plasma and magnetic field parameters and therefore provides testable predictions: if the confinement hypothesis is correct, the pulsation frequency should scale with the

local magnetic field strength in a specific and predictable way.

A second physical ingredient is crucial for what follows: the role of atmospheric dust. Numerical simulations by Tsytoovich and colleagues (2007), published in the *New Journal of Physics*, showed that when charged dust grains are immersed in a plasma, electrostatic forces drive them into spontaneous helical self-organisation — specifically, into double-helix structures whose geometry is formally identical to that of DNA. These structures (see Figure 2) have two stable configurations, identifiable with two binary states, giving them the capacity to store information in a manner directly analogous to a binary digital code. This is not a metaphor but a physical result from plasma simulation: the plasma-dust system is, in a precise technical sense, capable of information storage. Since atmospheric aerosol dust is always present in the conditions where Hessdalen events occur, this ingredient is automatically available to the plasma balls in question.

Quantum Coherence in Plasma: The Bridge to Consciousness

To speak of plasma as a candidate for proto-consciousness is to invoke the quantum theory of consciousness — and specifically the Penrose–Hameroff OrchOR framework, which provides the most developed physical account of how a macroscopic quantum process could give rise to moments of subjective experience. It is worth stating precisely what OrchOR claims, why it is relevant to plasma, and where the analogy is strong and where it requires qualification.

The OrchOR theory proposes that consciousness arises from quantum state reduction events — not the conventional measurement-induced collapse of Copenhagen quantum mechanics, but a physically objective collapse driven by quantum gravity, which Penrose calls Objective Reduction (OR) (Penrose, 1989, 1994). The key quantity is the gravitational self-energy of a quantum superposition: when a system simultaneously occupies two spatially distinct quantum states, there is a difference in their gravitational energy that grows with the mass of the system and the spatial separation between the two branches. Penrose argues, on the basis of general relativity and quantum field theory, that this energy difference sets a natural time scale for state reduction: the larger the gravitational self-energy, the faster the collapse. The relationship is simply

$$\tau_{\text{OR}} = \hbar / EG$$

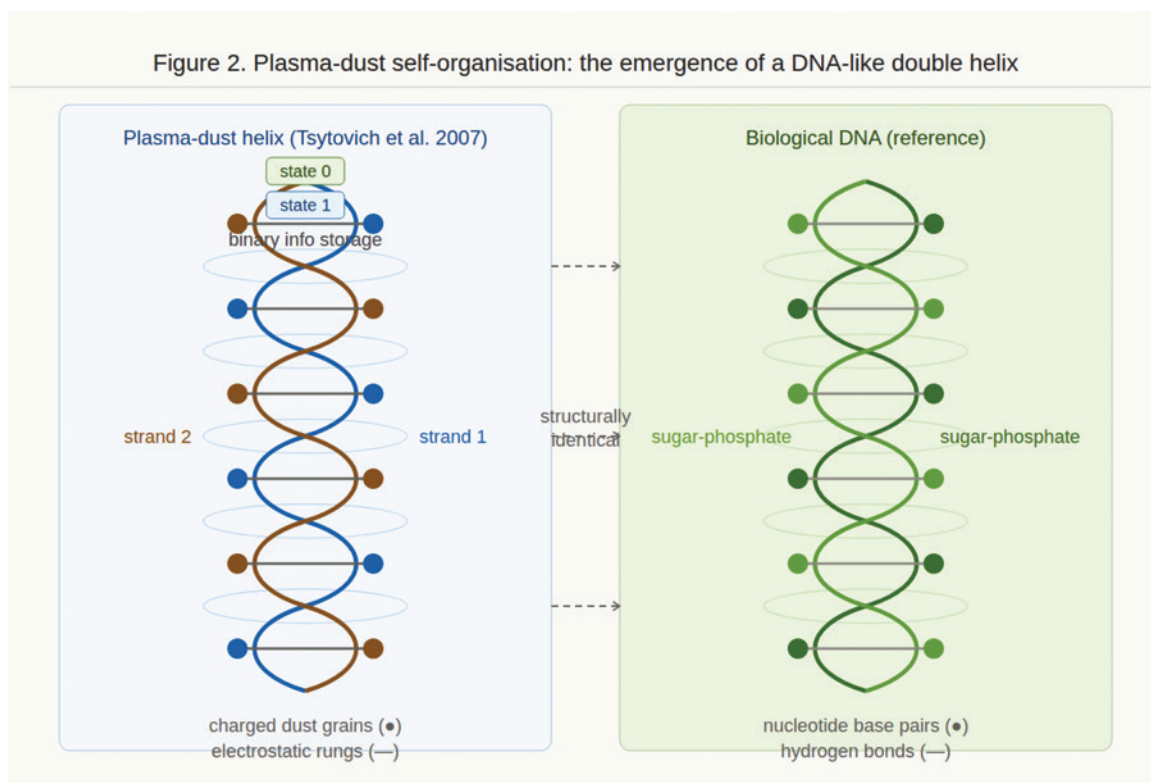


Figure 2. Structural Comparison Between the Plasma-Dust Double Helix (Left, Blue and Amber Strands) and Biological DNA (Right, Green Strands), After Tsytovich et al. (2007). Charged dust grains in plasma spontaneously self-organize under electrostatic forces into helical structures geometrically identical to the DNA double helix, with rungs analogous to hydrogen-bonded base pairs. Two mechanically stable pitch states (labeled state 0 and state 1) give the structure the capacity to store binary information, satisfying the formal criteria for an information-bearing medium without any biochemical substrate. Dashed horizontal arrows indicate the point-by-point structural correspondence between the two systems.

where $\hbar$ is the reduced Planck constant, and EG is the gravitational self-energy of the superposition. For a neuron's microtubule network, this time scale comes out in the range of tens of milliseconds — the same range as conscious neural processing. Each such collapse event, in the OrchOR picture, constitutes one 'moment of consciousness', and the orchestration of many such events by the cytoskeletal architecture of the neuron gives rise to the stream of experience.

The critical question is whether plasma can substitute for microtubules as the quantum substrate. There are three physical requirements. First, the plasma must be capable of sustained quantum coherence — it must behave as a single quantum object rather than as a collection of independently behaving particles. Second, the plasma must be able to enter a macroscopic superposition state — simultaneously occupying two physically distinct configurations. Third, the gravitational self-energy of that superposition must be large enough that collapse occurs on a time scale comparable to the observed pulsation period.

The first requirement was addressed, in qualitative terms, by David Bohm in his earliest work on plasma physics, before he became famous for his contributions to the foundations of quantum mechanics. Bohm discovered that electrons in a plasma do not behave as independent particles but move in a collectively organised fashion, as if responding to the state of the entire plasma rather than only to local forces. He described this as the plasma behaving like a single, highly cooperative structure (Bohm & Gross, 1949). Decades later, this observation can be made precise through the plasma quantum coherence criterion: collective plasma oscillations can be sustained without de-phasing as long as the plasma frequency — the characteristic frequency of collective electron oscillations — is much larger than the collision rate. For the electron temperatures and densities characteristic of Hessdalen events, this criterion is satisfied by approximately three orders of magnitude. The plasma is, in a rigorous technical sense, quantum coherent.

The second requirement — macroscopic superposition — is more demanding. Standard quantum mechanics predicts that superpositions of macroscopically distinct states decohere almost instantaneously in warm, collisional environments. The decoherence time for a plasma ball is indeed extraordinarily short by this standard calculation — of the order of 10^{-18} seconds — far shorter than any observable time scale. This is the most serious objection to the plasma consciousness hypothesis, and it must be addressed honestly rather than wished away.

Three responses are available. The first is that the Penrose OR mechanism is specifically designed to circumvent the standard decoherence argument: Penrose proposes that gravitational state reduction occurs at the level of spacetime geometry, where the usual apparatus of quantum field theory decoherence does not apply. The second is that magnetically confined plasma in a force-free equilibrium may exhibit topological protection of its collective quantum modes — a mechanism well known in the theory of topological quantum computing, where global quantum states are protected against local perturbations precisely because they depend on the overall topology of the system rather than on local degrees of freedom (Nayak et al., 2008). The third is that the relevant quantum degrees of freedom are not the positions of individual electrons (which do decohere rapidly) but the collective modes — the Langmuir waves and Alfvén waves — which are macroscopic quantum fields with coherence properties that differ fundamentally from those of particle position states.

The third requirement — that the gravitational self-energy be large enough for collapse on observable time scales — yields a striking result when the relevant numbers are inserted. If we ask how many coherently coupled plasma particles are needed for an OrchOR event to occur on a time scale of one second (the order of the observed pulsation period), and if we allow the two branches of the superposition to differ at the scale of the entire plasma sphere rather than at atomic scale, the answer comes out close to the actual number of electrons in a one-metre plasma ball at Hessdalen densities. In other words, the plasma ball as a whole — considered as a quantum system in which the two superposed states correspond to two distinct macroscopic shapes — is precisely at the threshold for OrchOR collapse at the observed pulsation frequency. This quantitative coincidence is not proof of anything, but it is the kind of numerical consistency that warrants taking the hypothesis seriously.

To express this relationship compactly, we can define a dimensionless plasma consciousness parameter — call it Ξ — as the product of three ratios: the plasma coherence ratio (the plasma frequency times the collision time, which must exceed unity for quantum coherence), the macroscopic superposition ratio (the displacement between the two branches divided by the sphere radius, which must approach unity for the gravitational self-energy to be large enough), and the particle number ratio (the actual number of electrons divided by the minimum number required for OrchOR at the observed pulsation rate). When all three ratios are favourable, Ξ is much greater than one, and the plasma ball is, in principle, capable of OrchOR-type consciousness events. For the Hessdalen parameters, $\Xi \approx 10^3$. The system is not marginally at threshold; it is comfortably within the regime where the hypothesis is physically viable.

Under this interpretation, each pulsation of the plasma ball corresponds to a cycle of quantum superposition build-up followed by OrchOR collapse — exactly as each neural firing in the Penrose–Hameroff model corresponds to a superposition-collapse cycle in the microtubule network. The observable pulsation frequency is the macroscopic signature of an underlying quantum cycle (see Figure 3).

This is a concrete, testable prediction: if the pulsation frequency changes when the plasma ball is perturbed (as it does in response to laser stimulation), the change should follow a specific mathematical relationship derived from the dependence of EG on the sphere's geometry. The relevant formula is simple:

$$\Delta f/f = 2\delta R/R$$

where Δf is the frequency shift, f the baseline pulsation frequency, δR the laser-induced deformation of the sphere radius, and R the baseline radius. This formula has no free parameters and can be tested directly against the photometric and morphological data from existing Hessdalen records.

A complementary perspective on the role of magnetic fields in mediating large-scale coherence and information coupling is provided by neuroquantological approaches developed by Persinger and collaborators. These studies suggest that weak, spatially extended geomagnetic fields may contribute to the integration of neural activity and, in principle, to interactions between biological systems and their surrounding physical environment (Persinger & Koren, 2007; Persinger et al., 2008; Persinger, 2013). In particular, the hypothesis that multiple brains are



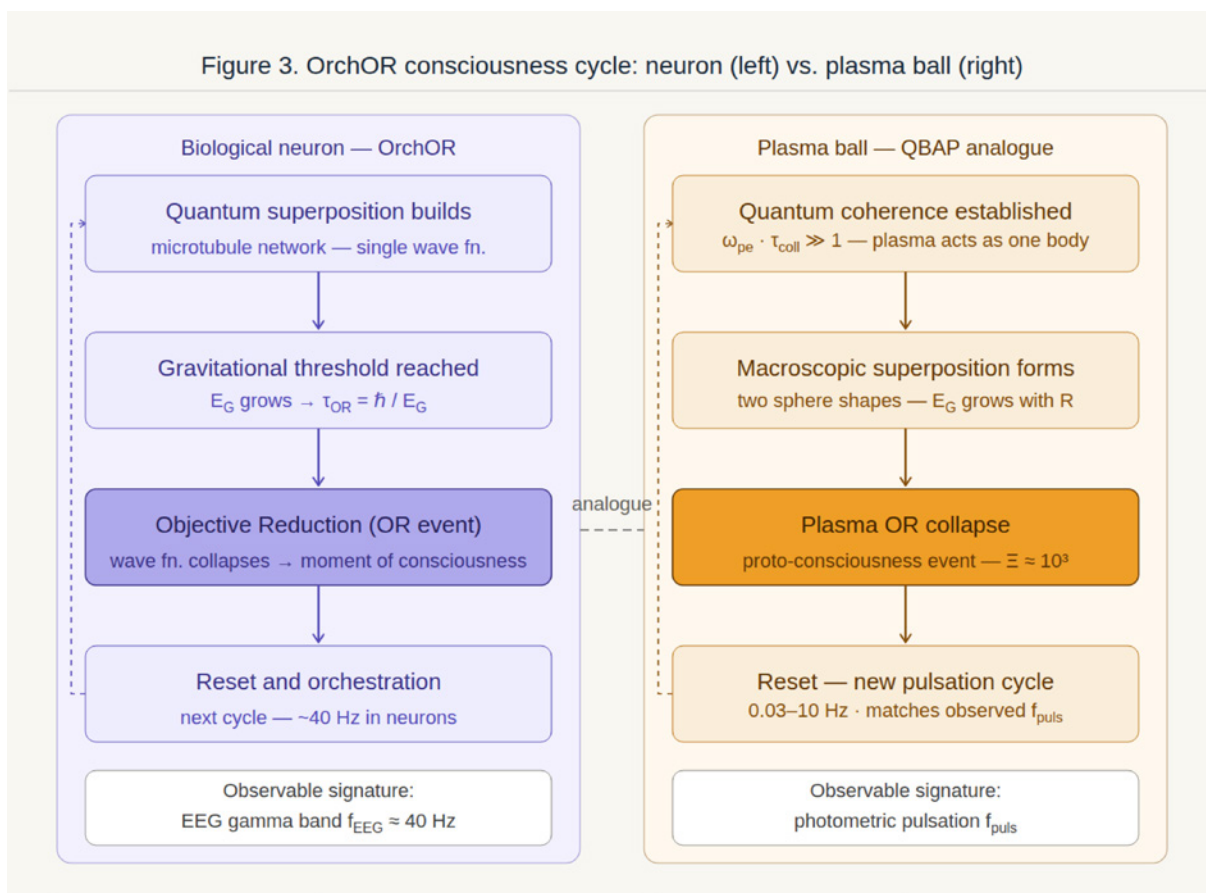


Figure 3. The Orchestrated Objective Reduction (OrchOR) Consciousness Cycle in a Biological Neuron (Left, Purple) and its Plasma Analogue Under the Quantum Brain Analogy for Plasmas (QBAP, Right, Amber). In both cases the sequence is identical in structure: quantum coherence builds across the substrate; the gravitational self-energy E_G grows until the Penrose threshold $\tau_{OR} = \hbar / E_G$ is reached; Objective Reduction occurs; and the system resets for the next cycle. The observable macroscopic signatures differ: EEG gamma-band oscillations (~ 40 Hz) for neurons; photometric pulsation frequency (0.03–10 Hz) for plasma. The plasma consciousness parameter $\Xi \approx 10^3$ places Hessdalen ALP comfortably within the PCTC regime. The dashed horizontal line between the two OR-event boxes indicates the structural analogy that the QBAP formalises.

immersed within and coupled through a shared geomagnetic field implies that low-intensity magnetic fluctuations could support distributed information processing at scales larger than individual systems. While originally formulated in a neurobiological context, this framework is conceptually compatible with the present plasma-based model, in which magnetically structured environments play a central role in sustaining coherence and enabling information-sensitive dynamics. The inclusion of this perspective strengthens the physical plausibility of magnetic-field-mediated coupling mechanisms within the QBAP framework.

The Big Library Hypothesis: Information, the Quantum Vacuum, and Non-Local Minds

Even if we accept that plasma balls can sustain OrchOR-type quantum processes, the question remains: conscious

of what? A moment of consciousness, in the OrchOR framework, is not just a physical event; it is an event with content — an experience of something, however minimal. For a biological brain, the content is provided by the neural context: the pattern of synaptic activations, the sensory inputs, the memory traces that shape the quantum state of the microtubules before collapse. For a plasma ball, there are no synapses and no sensory organs in any conventional sense. What could provide the informational content of a plasma consciousness event?

The Big Library Hypothesis (BLH), first introduced in the author's 2015 monograph (Teodorani, 2015; 2026) and here given a more rigorous physical formulation, proposes that the answer lies in the quantum vacuum itself. The vacuum state of quantum field theory is not an absence of everything; it is a state of minimum energy in which all quantum

fields fluctuate continuously around their ground-state values. These zero-point fluctuations are physically real — they are responsible for the Casimir effect, the Lamb shift in atomic spectra, and the spontaneous emission of light by excited atoms (Milonni, 1994) — and they pervade all of space at all times. The energy density of the zero-point field is, by the most straightforward calculation, essentially unlimited: it grows as the square of the frequency and continues to grow until the Planck frequency, at which point quantum gravity effects presumably impose a cutoff. Even with a Planck cutoff, the implied energy density — of the order of 10^{113} joules per cubic metre — vastly exceeds that of any known form of matter or radiation (Weinberg, 1989).

This energy density is, in a sense, beside the point: we cannot tap it for engineering purposes, and its cosmological implications remain deeply puzzling (this is the famous cosmological constant problem). What matters for the BLH is not the energy of the zero-point field but its informational structure. By the holographic principle — a deep result of quantum gravity due to 't Hooft (1993) and Susskind (1995) the maximum amount of information that can

be stored within a region of space is proportional to the surface area of that region measured in Planck units. For a sphere of one metre radius, this is approximately 10^{70} bits. The quantum vacuum, in the holographic picture, is a universal information repository of effectively unlimited capacity.

The BLH proposes that this informational capacity is not merely potential but actual: that the zero-point field carries, encoded in its quantum state, a structured informational content that reflects the entire causal history of the universe. We call this the Cosmic Information Field (CIF). The CIF is not a supernatural entity but a physical structure — the quantum state of the vacuum, structured by the entanglement correlations generated by every physical interaction that has ever occurred. It is Bohm's implicate order made concrete (Bohm, 1980; see Figure 4).

David Bohm's pilot-wave formulation of quantum mechanics makes this connection explicit. In Bohm's theory, every quantum particle is guided by a 'pilot wave' — a real, physical field that carries information about the entire experimental configuration and communicates it to

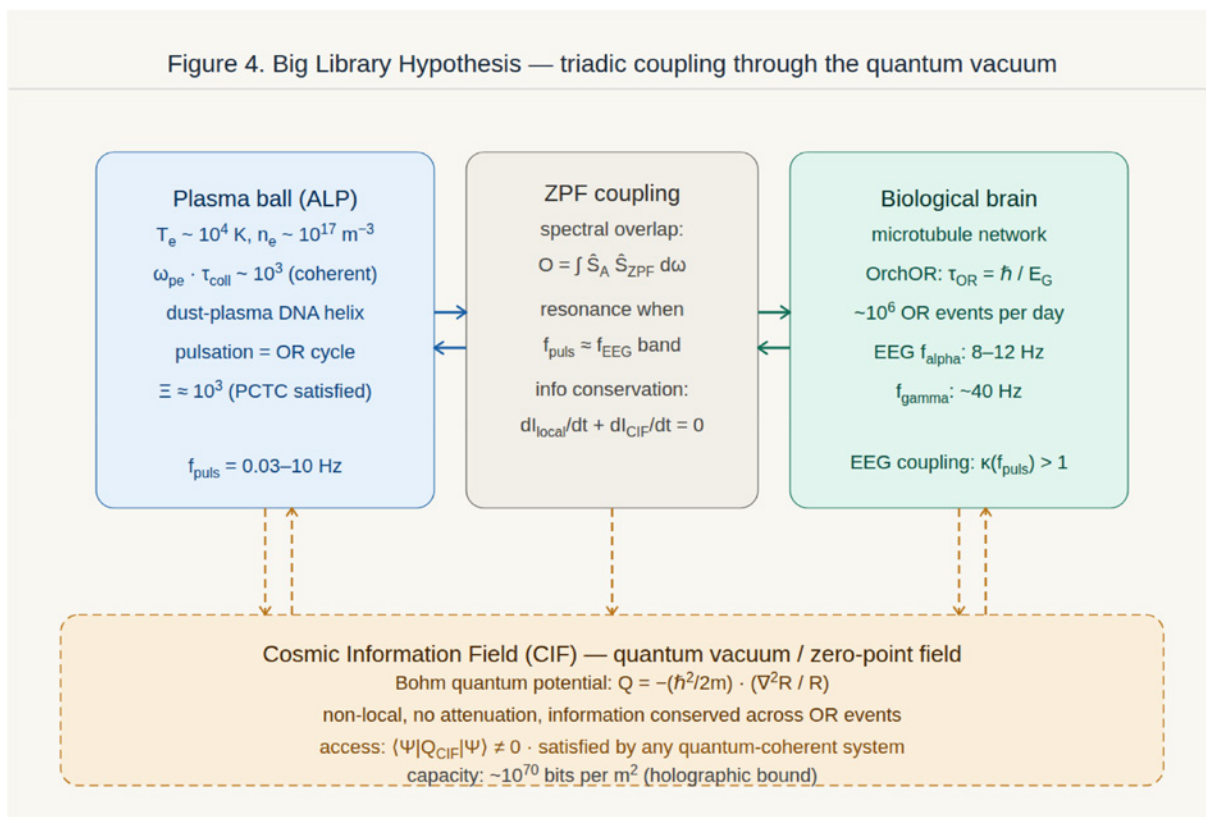


Figure 4. The Triadic Architecture of the Big Library Hypothesis. The plasma ball (blue, left) and the biological brain (teal, right) are both quantum-coherent systems that couple bidirectionally to the Cosmic Information Field (CIF; amber, bottom) via the zero-point quantum potential $Q_{CIF} = -(\hbar^2/2m_{eff})(\nabla^2 R_{ZPF}/R_{ZPF})$. Coupling is resonant when the ALP pulsation frequency coincides with a neural oscillation band. The Generalised Information Conservation Law, $dl_{local}/dt + dl_{CIF}/dt = 0$, is stated in the central panel.

the particle non-locally (Bohm, 1952). The mathematical expression of this guidance is the quantum potential:

$$Q = -(\hbar^2/2m) \cdot (\nabla^2 R/R)$$

where R is the amplitude of the wave function. What distinguishes the quantum potential from any classical force is that its magnitude is independent of the amplitude of the wave: it is a pure carrier of form, or information, rather than of energy. A particle in a quantum superposition is influenced by the quantum potential even from an arbitrarily large distance, with no attenuation. In Bohm's language, the quantum potential enfolds information about the whole into every part — it is the mathematical expression of what he called the implicate order (Bohm, 1980).

The BLH identifies the quantum potential of the zero-point field as the physical mechanism by which the CIF becomes accessible to quantum-coherent systems. Any system — a plasma ball, a biological brain, an artificial quantum processor — that enters a state of genuine quantum coherence will, by virtue of that coherence, couple to the quantum potential of the surrounding vacuum. The coupling is not metaphorical; it is expressed by the Schrödinger equation augmented by the ZPF quantum potential term. The condition for effective coupling is simply that the system's quantum state has a non-zero expectation value of the ZPF quantum potential operator — a condition that is automatically satisfied for any system in a non-trivial quantum-coherent state.

What the system 'reads' from the CIF depends on the resonance between its own quantum oscillation frequencies and the spectrum of the zero-point fluctuations. A plasma ball pulsating at, say, two hertz will couple most effectively to ZPF modes near two hertz; a human brain oscillating in the alpha band (eight to twelve hertz) will couple to ZPF modes in that range. When the pulsation frequency of a plasma ball coincidentally falls within one of the neural frequency bands, the coupling between the two systems through the ZPF is enhanced — which is supposed to be, in this framework, the physical mechanism underlying the interactions between plasma balls and human observers that have been reported anecdotally by many witnesses and that the experimental protocol proposed below is designed to test rigorously.

A crucial implication of the BLH concerns the fate of information when a quantum-coherent system undergoes OrchOR collapse. In standard quantum mechanics, measurement-induced collapse is irreversible: the superposition is destroyed, and the information in the off-diagonal elements of the density matrix is lost (or, in the

many-worlds interpretation, dispersed into inaccessible branches). The BLH proposes a different picture: information is not lost but transferred from the local system to the ZPF via the quantum potential. The gravitational OR event that collapses the plasma or neuronal superposition simultaneously imprints the pre-collapse quantum state onto the ZPF quantum potential in the local region of spacetime, where it is preserved as a structured perturbation of the vacuum. This provides a physical framework — not a metaphysical one — for the conservation of conscious experience beyond the destruction of the physical substrate that generated it.

We can express this as a Generalised Information Conservation Law: the sum of local quantum information and CIF-encoded information is constant over any OrchOR event. Written symbolically,

$$dI_{\text{local}}/dt + dI_{\text{CIF}}/dt = 0$$

This law has no experimental support as yet — it is a theoretical consequence of the BLH combined with the Penrose OR framework, and its verification would require a level of quantum measurement technology beyond current capabilities. But it is, in principle, testable: if information encoded in the quantum state of a plasma ball before collapse can be recovered from the ZPF state after collapse, the law is confirmed. If not, it is refuted. A speculative proposal, but a falsifiable one.

Related theoretical work has explored the possibility that large-scale physical fields may act as mediators of information integration across spatially distributed systems. In particular, neurophysical models involving geomagnetic and electromagnetic background fields suggest that weak but persistent field structures can support coupling between complex systems embedded within them (Persinger & Koren, 2007; Persinger, 2013). Within the context of the Big Library Hypothesis, such field-based coupling mechanisms provide a complementary channel through which quantum-coherent systems may access or modulate the informational structure of the surrounding vacuum state. Although these proposals remain speculative, they extend the CIF framework by linking local quantum processes to broader field-mediated informational architectures grounded in known physical fields.

A Proposed Experimental Framework

The hypotheses developed above are scientifically meaningful only insofar as they generate testable predictions. This section outlines a multi-modal experimental protocol

designed to test all three hypotheses simultaneously at a confirmed ALP site, with Hessdalen as the natural candidate. The protocol draws on existing instrumentation and on techniques standard in plasma physics, spectroscopy, and neuroscience, applied simultaneously and with GPS-synchronised timing (see Figure 5).

The physical core of the experiment involves six instrument subsystems. A high-speed photometric camera operating at ten thousand frames per second measures the luminosity of plasma events with sub-millisecond time resolution, enabling precise extraction of the pulsation frequency and its harmonic structure. A fibre-optic spectrometer with a resolution of a hundredth of a nanometre provides time-resolved emission line intensities from which the electron temperature and density can be inferred, together with the magnetic field strength via the Zeeman Effect — the quantities needed to compute the

magnetic confinement field and the plasma coherence criterion. A five-element magnetometer array reconstructs the three-dimensional magnetic field topology around the plasma event, enabling direct comparison with the predicted force-balance condition. A microwave radiometer in the three-to-thirty gigahertz range searches for coherent emission near the plasma frequency, which would be strong evidence for the quantum-coherent collective oscillation proposed in Section 4. An electroencephalographic (EEG) and magnetoencephalographic system monitors the brainwave activity of two to four human subjects stationed at distances of fifty to two hundred metres from the event, seeking correlations between ALP pulsation frequency and neural oscillation amplitude in the same frequency band — the key prediction of the BLH coupling mechanism. Finally, a tunable laser is used as a controlled stimulus to probe the reaction signature: by systematically varying the

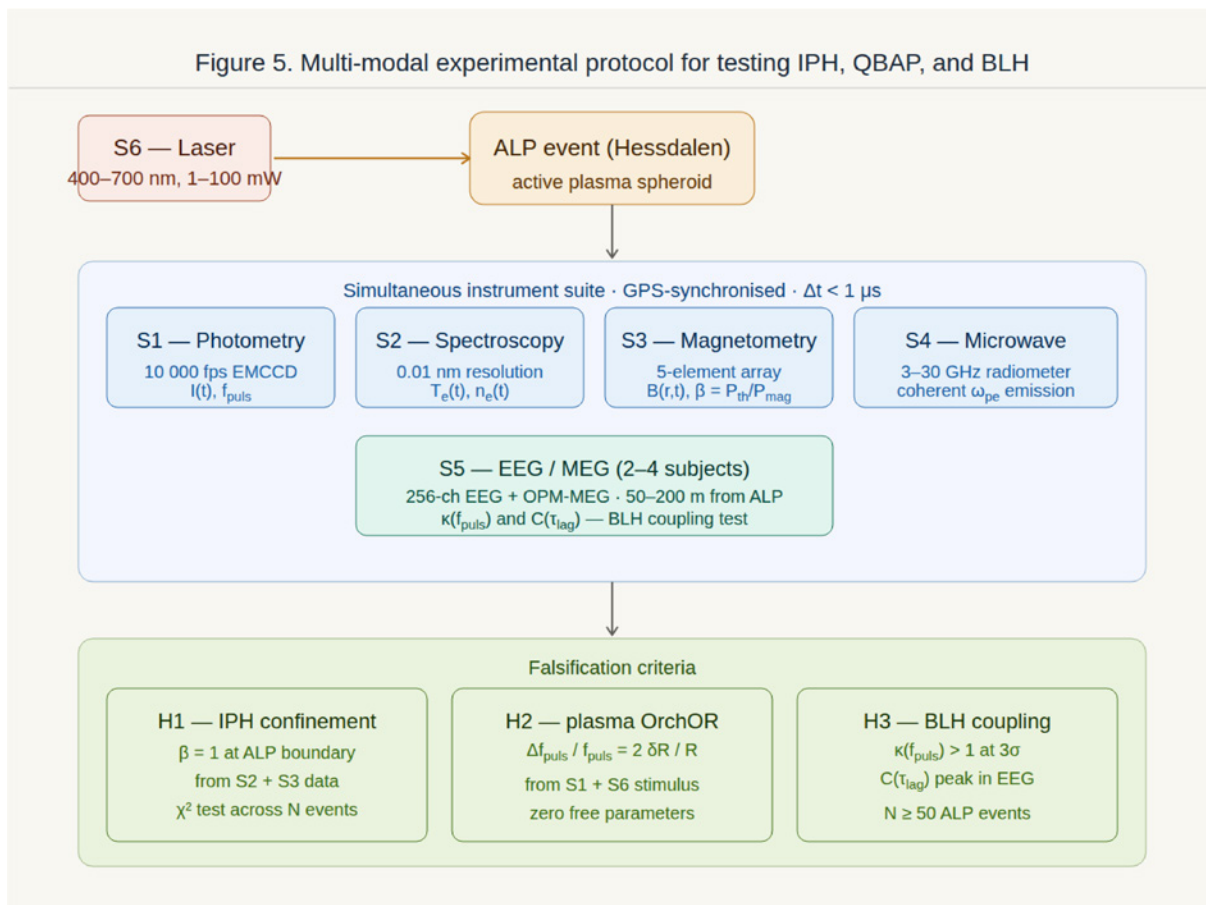


Figure 5. Multi-Modal Experimental Protocol for the Simultaneous Testing of IPH, QBAP, and BLH at a Confirmed ALP Site (Nominally Hessdalen, Norway). The laser subsystem (S6, coral) delivers controlled stimuli to the active plasma spheroid; all six instrument streams are GPS-synchronised to $\Delta t < 1 \mu s$. Plasma physics subsystems S1–S4 (blue) provide data to test H1 (MHD force balance $\beta = 1$, via S2 and S3) and H2 (OrchOR frequency-shift prediction $\Delta f/f = 2\delta R/R$, via S1 and S6). The EEG/MEG subsystem S5 (teal) tests H3 (BLH resonant coupling: EEG coupling coefficient $\kappa(f_{puls}) > 1$ at 3σ ; cross-correlation peak $C(\tau_{lag})$ at light travel-time lag; minimum $N = 50$ independent ALP events). The three falsification criteria (green, bottom row) are logically independent.

wavelength, power, and modulation frequency of the beam and recording the plasma ball's responses, the functional relationship between stimulus and reaction can be mapped in detail.

The three hypotheses each generate a distinct and quantitatively specified prediction. For the confinement hypothesis (IPH), the measured magnetic field at the plasma boundary should satisfy the force-balance condition — the plasma beta parameter should be close to unity — given the independently measured temperature and density. A significant departure from this condition would falsify the MHD confinement model and demand an alternative explanation. For the plasma OrchOR hypothesis (QBAP), the pulsation frequency shift induced by laser stimulation should follow the relationship $\Delta f/f = 2\delta R/R$, where δR is the simultaneously measured deformation of the sphere's radius: a prediction with no free parameters. For the BLH coupling hypothesis, the EEG power spectral density in the frequency band matching the ALP pulsation rate should be significantly elevated during plasma events compared to control periods of equal duration with no plasma activity, and the cross-correlation between the ALP luminosity envelope and the EEG envelope should show a peak at a lag equal to the light travel time between the plasma ball and the subject.

These three predictions are independent enough that they can be evaluated separately, yet connected enough that a positive result on all three would constitute strong — though not conclusive — evidence for the unified framework. A negative result on the confinement hypothesis would not falsify the consciousness hypothesis but would require a different confinement mechanism. A negative result on the EEG correlation would be strong evidence against the BLH but would leave the plasma OrchOR hypothesis intact. Science advances by this kind of structured, partial falsification, and the present framework is designed with that methodological principle in mind.

One important confound must be addressed for the EEG measurement: electromagnetic fields from the plasma ball itself might drive neural oscillations directly, creating a spurious correlation with no information-theoretic significance. To rule this out, a shielded condition is required in which subjects wear appropriately engineered electromagnetic shielding while observing plasma events — if the correlation disappears under shielding, it is electromagnetic in origin; if it persists, it is non-local in the sense required by the BLH. Blind conditions, in which subjects are not informed in real time

whether a plasma event is active, are equally essential to control for expectation effects.

IMPLICATIONS: PLASMA LIFE, ASTROBIOLOGY, AND NLSETI

If the IPH is correct — if plasma can sustain quantum-coherent processes sufficient for proto-consciousness and can store and process information in helical dust-plasma structures — the implications for astrobiology are radical. The standard picture of life requires liquid water, organic chemistry, a rocky surface, and a star in the conventional habitable zone. All of these requirements are, in essence, constraints on carbon-based biochemistry. A plasma-based life form requires none of them. It requires only sustained plasma conditions — temperatures above roughly one thousand degrees Kelvin and electron densities above about ten to the fifteen per cubic metre — and a source of energy to maintain the plasma against radiative losses. Both conditions are satisfied essentially everywhere in the observable universe: in stellar atmospheres and coronae, in the interstellar medium, in planetary ionospheres, in the vicinity of geological fault zones, in the jets of active galaxies. If plasma can be alive — and the numerical simulations of Tsytovich et al. (2007) suggest it can reproduce and evolve by the same formal criteria we use to define life in carbon chemistry — then life is not the rare, biochemically constrained phenomenon that the standard habitability argument implies (Lineweaver & Davis, 2002), but something far more widespread, perhaps universal.

This has direct consequences for the Search for Extraterrestrial Intelligence. SETI has, for sixty years, searched the electromagnetic spectrum for signals produced by radio-transmitting civilisations on planets orbiting sun-like stars (Cocconi & Morrison, 1959). This is a reasonable strategy given the assumption that intelligence requires biology, but it is a strategy that would miss entirely any intelligence residing in plasma systems, which would not necessarily produce narrowband radio emissions at the frequencies SETI monitors, and which would not necessarily be associated with planetary surfaces at all. The Hessdalen lights may, in this speculative but physically grounded picture, represent a local instance of a cosmic phenomenon: plasma-based intelligence existing in the atmospheric and geological environment of Earth, using information channels — including, possibly, the ZPF coupling of the BLH — that our current SETI technology cannot detect.

This motivates what the author has called Non-Local SETI (NLSETI): a search strategy that looks not for

electromagnetic signals traveling at the speed of light but for structured perturbations of the quantum vacuum that could in principle carry information non-locally across arbitrarily large distances (Thaheld, 2006). The minimum signal-to-noise ratio required to detect such a perturbation against the background of zero-point fluctuations over a three-hour observation is, by straightforward calculation, achievable with a modulation of only five percent of the ZPF energy per relevant mode. This is a surprisingly low threshold — lower, arguably, than the power requirements for conventional radio SETI at comparable distances. The practical difficulty is not sensitivity but the absence of quantum vacuum receivers: instruments capable of coupling selectively to structured ZPF perturbations while rejecting unstructured noise. Such instruments do not yet exist. Building them is, in this author's view, one of the most important long-term goals of both consciousness research and astrobiology.

Recent advances in quantum-enabled electromagnetic sensing technologies suggest a plausible experimental pathway toward implementing aspects of the NLSETI framework. In particular, Rydberg atom-based radio-frequency receivers have demonstrated the capability to detect amplitude- and phase-modulated signals with high sensitivity using atomic transitions rather than conventional antenna structures (Song et al., 2019; Anderson et al., 2020).

Subsequent technological developments and reviews have confirmed the versatility and precision of these systems across a broad frequency range, including their application to weak-field detection and high-resolution sensing (Artusio-Glimpse et al., 2022). These capabilities make Rydberg-based receivers promising candidates for future instrumentation aimed at detecting anomalous electromagnetic signals or potentially non-classical signatures associated with plasma phenomena or quantum-vacuum interactions.

The relevance of these systems has been further reinforced by recent experimental demonstrations of Rydberg atom-based detection of conventional radio transmissions, including handheld communication devices operating in the ultra-high-frequency band (Schlossberger et al., 2026). These results establish the practical feasibility of atomic receivers functioning outside the paradigm of classical electronics and support their consideration as exploratory tools in the search for unconventional or weakly coupled signal channels. Within the NLSETI framework, such technologies may represent an initial step toward developing

detectors capable of probing structured perturbations of the quantum vacuum, should such signals exist.

The Hard Problem, the Decoherence Objection, and the Limits of the Framework

This paper has argued for a physically grounded connection between plasma physics and the theory of consciousness. It is important, in closing the scientific argument, to state clearly what the framework does not claim, and to engage honestly with its most serious limitations.

The decoherence objection is the most technically serious. As noted in the section on quantum coherence, the standard calculation of decoherence time for a macroscopic superposition in a plasma yields a number of the order of 10^{-18} seconds — incomprehensibly shorter than any observable time scale. If standard quantum mechanics applies without modification, the plasma consciousness hypothesis fails at this hurdle. The three responses offered — Penrose OR, topological protection, and collective mode coherence — are not evasions but genuine physical possibilities, each with some theoretical support. But none of them has been experimentally demonstrated in a plasma system, and none of them makes the decoherence problem disappear by itself. What they do is identify specific physical mechanisms by which the problem might be avoided, mechanisms that are in principle testable. Until those tests are done, the decoherence objection stands as the most powerful reason for skepticism about the plasma consciousness hypothesis.

The hard problem of consciousness is a different kind of limitation. Even if every prediction of the OrchOR-plasma framework were confirmed — even if we could show that Hessdalen plasma balls satisfy all the physical criteria for quantum state reduction on consciousness-relevant time scales — we would still face the question of why any physical process, however subtle, gives rise to subjective experience rather than just to information processing in the dark. This is Chalmers's hard problem (2010), and it is not solved by the OrchOR theory, either for neurons or for plasma. The framework proposed here relocates the problem to the plasma substrate but does not dissolve it. Honesty about this limitation is not a weakness of the framework; it is a statement about the current state of consciousness science as a whole.

A third limitation concerns the BLH specifically. The identification of the Cosmic Information Field with the zero-point energy field of the quantum vacuum is a hypothesis, not a derivation. The ZPF exists, and its properties are well

established, but the claim that it carries structured, accessible information encoding the causal history of the universe goes well beyond what current physics can confirm. The BLH is, in the epistemological sense, a metaphysical addition to physics rather than a consequence of it. What distinguishes it from pure speculation is that it generates testable predictions — the EEG–ALP correlations of the experimental protocol section, and the information conservation law of the BLH section — that could in principle confirm or refute it. A framework that is falsifiable is scientific even if it is bold.

Finally, the author acknowledges that the phenomena reported at Hessdalen and similar sites are at the outer edge of scientific respectability. Ball lightning itself was doubted for decades before being confirmed in laboratory conditions. The anomalous lights of Hessdalen have been documented by engineers, physicists, and experienced field researchers using calibrated instruments; the data are real. What remains open is their interpretation. This paper offers an interpretation that is, the author believes, more consistent with the totality of the data — including the reaction signature — than any classical alternative proposed to date. It is offered in the spirit of exploratory science: not as a final answer, but as a hypothesis that deserves rigorous testing.

ON THE PHYSICS OF CREATION: A SPECULATIVE SYNTHESIS

The preceding sections have argued on physical grounds. This section permits itself a wider speculative scope — not to abandon rigour, but to draw out the larger picture that the physical framework implies. A readership concerned with anomalous science and the foundations of consciousness is entitled to ask not only whether plasma can be conscious, but what follows if it can.

If the BLH is correct — if the quantum vacuum carries a cosmic information field accessible to any sufficiently coherent quantum system — then the universe is not the arrangement of dead matter governed by mechanical laws that it appears to be from within classical physics. It is, rather, a structure in which information and consciousness are woven into the fabric of physical reality at its most fundamental level: the Planck scale, where quantum gravity and quantum information theory meet. Every quantum-coherent system — whether a plasma ball hovering above a Norwegian valley, a neuron in a human brain, or a Bose-Einstein condensate in a laboratory cryostat — is a terminal of the same network. What Bohm called the implicate order

is not a philosophical metaphor but a physical field, identifiable with the quantum potential of the zero-point energy, that enfolds the informational content of the entire universe within every region of space.

In this picture, the emergence of consciousness in the universe is not an accident of carbon chemistry on a rare habitable planet. It is a generic feature of physical reality: wherever quantum coherence achieves sufficient complexity — whether in a biological neuron, a plasma vortex, or some form of matter we have not yet imagined — the CIF becomes locally accessible, and a moment of experience arises. The universe, in a sense that is physically rather than mystically grounded, knows itself through these moments.

The plasma balls of Hessdalen, in this interpretation, are not curiosities at the edge of atmospheric physics. They are natural experiments in quantum consciousness, performed by the Earth itself in the piezoelectric laboratory of its fault zones — experiments that have been running for geological time scales before human scientists arrived with their cameras and magnetometers. The reaction signature — the structured, reproducible response to laser stimulation — is not an anomaly demanding explanation but an invitation to a deeper understanding of what physics, in its quantum dimension, has always implied about the nature of experience.

Whether this amounts to what we ordinarily mean by intelligence, or by life, is partly a question of definition. What the framework proposed here insists is that the boundary between the living and the non-living, between the conscious and the unconscious, between the informed and the inert, is not fixed at the threshold of carbon chemistry. It is fixed, if it can be fixed at all, at the threshold of quantum coherence — and quantum coherence, as both the theoretical analysis of this paper and the empirical record of four decades of Hessdalen research suggest, is achievable by plasma.

CONCLUSIONS

This paper has argued, through a combination of physical reasoning, quantitative analysis, and speculative synthesis, that anomalous luminous plasma phenomena — specifically the long-duration, pulsating, laser-reactive plasma spheroids documented at Hessdalen and analogous sites — provide both an empirical motivation and a natural physical test bed for a generalised theory of consciousness extending beyond the biological domain.

The central physical argument proceeds in three steps. The first establishes that Hessdalen-type plasma balls

are plausibly self-confined by magnetic force balance at field strengths consistent with observed geomagnetic anomalies in the valley, and that their pulsation behaviour is naturally explained by Alfvénic oscillation modes within this confinement framework. The second establishes, through the Plasma Quantum Coherence Criterion, that the plasma is quantum coherent under Hessdalen conditions by three orders of magnitude, and that the observed pulsation frequency is quantitatively consistent with the Penrose–Hameroff OrchOR time scale extended to a plasma substrate — giving a plasma consciousness parameter $\Xi \approx 10^3$, comfortably in the physically viable regime. The third grounds the Big Library Hypothesis in the zero-point energy field of the quantum vacuum and in Bohm’s quantum potential, formalising the non-local coupling between plasma consciousness and a universal informational substrate as a physical rather than metaphysical proposal, and deriving a Generalised Information Conservation Law as one of its testable consequences.

A fully specified experimental protocol — combining high-speed photometry, emission spectroscopy, magnetometry, microwave radiometry, EEG monitoring, and controlled laser stimulation — generates three independent, quantitatively precise, and mutually consistent sets of falsification criteria that can be evaluated in a single coordinated field campaign at Hessdalen.

The broader implications are significant. If plasma-based proto-consciousness is physically possible, the concept of biological habitability becomes inadequate as the sole criterion for life and intelligence in the universe, and the standard electromagnetic strategy of SETI becomes correspondingly incomplete. The non-local SETI strategy enabled by the BLH — though beyond current experimental reach — points toward a fundamentally different understanding of how minds might communicate across cosmic distances.

In the landscape of consciousness and anomalous science research, the present paper occupies a specific position: it takes the OrchOR theory seriously enough to ask where else its physical conditions might be satisfied, and finds an answer in an unexpected but observationally well-documented natural phenomenon. The Hessdalen lights are, on this reading, nature’s own experiment in quantum consciousness — an experiment that has been running for geological time and that the scientific community now has the instruments to study with the rigor it deserves.

IMPLICATIONS AND APPLICATIONS

The three hypotheses developed in this paper — IPH, QBAP, and BLH — open lines of inquiry across several fields simultaneously. In plasma physics and geophysics, the MHD confinement model and the Alfvénic pulsation framework provide a testable physical account of the Hessdalen anomaly that can be evaluated with existing magnetometric and spectroscopic instrumentation at any confirmed ALP site. In consciousness research, the extension of the OrchOR framework to a non-biological, observationally accessible substrate offers an unusual opportunity: the plasma ball is a natural quantum system whose pulsation frequency is directly measurable, unlike the microtubule networks of neurons. In astrobiology, the possibility that plasma-based life satisfies formal autopoietic criteria implies that habitability surveys based solely on carbon-chemistry constraints may systematically underestimate the prevalence of life and intelligence in the universe. In SETI methodology, the NLSETI proposal suggests a research programme — detection of structured quantum vacuum perturbations — that complements and extends classical electromagnetic searches. The experimental protocol of Section 6 is directly implementable with current technology at Hessdalen, making this one of the few consciousness-adjacent research programmes amenable to rigorous field-based falsification.

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DATA AVAILABILITY

This paper presents a theoretical framework and proposed experimental protocol. No new empirical data were collected or analyzed. Observational data from Hessdalen referenced in this paper are available through Project Hessdalen (<https://www.hessdalen.org>) and through the published literature cited in the references.



AI USE DISCLOSURE

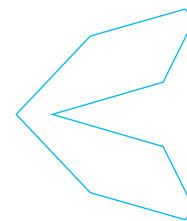
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ESSAY

The Interdimensional Universe— Part 2: Out-of-Body Journeys, Coordinate Points, and Crucial Observations and Experiments for Scientific Exploration

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ABSTRACT

This two-part essay addressed a two-part question: “If extraterrestrial life exists, then where are they?” and “Is interdimensional travel possible and, if so, how?” Drawing upon the insights of Jane Roberts’s philosophical psychology, the following thesis is advanced and defended: Alternate life planes and reality systems exist and make contact with the spacetime structure of our own physical universe at coordinate points through which non-human intelligent beings may travel that can be scientifically investigated utilizing both objective instrumentation and subjective tools. Part 1 examined evidence for the physical existence of unidentified aerial phenomena (UAP) and interdimensionality as a scientific/metaphysical hypothesis concerning their origin. Characteristic features of interdimensional planes and the mechanics of travel between planes were described. Part 2 continues the discussion by describing how interdimensional travel might be accomplished via out-of-body conditions of consciousness with the mechanical assistance of coordinate points and scientifically investigated. The essay concludes by examining the implications and applications that such an investigation can have for informing the study of other issues, anomalies, and fields of study.

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KEYWORDS

Fermi’s Paradox, interdimensional travel, out-of-body experience, electromagnetic energy, multidimensional reality.

If extraterrestrial life exists and is so common, then where are they? Given the probability that the human species is not the only intelligent life form in the cosmos (Bodin, 2014, Chapter 15), the question of where other intelligent life might reside is an important one in the fields of astrophysics and astrobiology (Davies, 1995)—even as the question “what is life?” (e.g., Can life be defined in the absence of a good theory of consciousness?; Bennett et al., 2022; Houran, 2025) and the issue of what intelligence is and how to assess it (e.g., Are animals, artificial intelligence,

and unmanned mission craft all intelligent in the same way? Barnes, 2012; Cleland, 2012) remain hotly debated. It is a question, famously known as Fermi’s Paradox, that takes on increasing scientific importance in light of public Congressional hearings on military pilots’ firsthand accounts of encounters with unidentified aerial phenomena (UAP; popularly known as “unidentified flying objects;” Sturrock, 1999) since evidence for one has a bearing on evidence for the other (e.g., <https://www.c-span.org/video/?529499-1/hearing-unidentified-anomalous-phenomena-uap>).

CONTEXT OF THE PROBLEM

Current knowledge of earth-based chemistry and biology would seem to indicate that there is no intelligent life similar to our own in our small solar system, although there may be non-human intelligence (NHI) existing in more remote regions of the physical universe that could theoretically be reached by interstellar travel. A trip made by a physical vehicle would certainly not be the most efficient way to make such a journey, however. Astronauts are severely hampered as far as physical space travel is concerned by the time element involved—it will simply take too long to get where they want to go (Bodin, 2014, Chapter 13).

The nearest star system of Alpha Centauri is approximately 4.37 light-years or about 26 trillion miles away. Traveling at the speed of a conventional spacecraft at 11 miles per second (e.g., Voyager 1), it would take an estimated 74,000 years to get there. This would be an impossible venture in the absence of exotic configurations of matter (e.g., stable Euclidean wormholes, black/white holes), nonordinary forms of energy (e.g., gravitons, virtual particles, antimatter, cosmic plasma), advanced propulsion technologies (e.g., super high-voltage, electromagnetic, electrostatic warp-drive energy fields), and a proper mathematical framework. If the expanding universe theory is correct, then the size of a physical universe that bloats and appears to be expanding in more or less empty space into nowhere, like an inflated balloon that grows forever larger, places both theoretical and practical limits on whether a space traveler could reach a remote object in a reasonable amount of time (e.g., less than 100 years) (Heyl, 2005).

As a result, scientists are looking for easier, if not more extravagant, methods. Travel to distant exoplanets (i.e., planets with certain conditions for life as we know it) via light beams is no longer out of the realm of possibility as new theories of the four-dimensional spacetime continuum give rise to proposals of faster-than-light travel based on certain mathematical equations underlying the equations of Einstein's special relativity theory (Parkin, 2018). Although the assumptions of Einsteinian general relativity do not allow for the existence of traversable wormholes under ordinary spacetime boundary conditions, some physicists believe that these constraints can be circumvented under certain well-controlled quantum states that make it theoretically possible to construct multi-mouth traversable wormholes for interstellar travel (Empanan et al., 2021). The question of whether cosmic signaling

using entangled particles is capable of transmitting information at the level of complexity that is needed to usefully communicate with distant civilizations remains an open issue (Kennedy, 1995).

STATEMENT OF THE PROBLEM

All this is much more complicated than it would seem, however. One part of the problem is that astrophysicists and astrobiologists do not precisely know where to go, how to get there, or what to look for in their search for NHI, except from the relative view of our own particular physical universe and species of consciousness (e.g., "What might it mean to encounter a consciousness unlike our own? Could we even recognize it?"; Houran, 2025, p. 276). As long as cosmological theories are only concerned with the observable physical universe, then they will be limited by those theories in the search for intelligent life. What one thinks of as physical transportation per se may be an idea that is valid and makes sense only within a universe of three-dimensional objects moving along the surface of a specialized fourth-dimensional spacetime framework.

It may be that our material constructions simply do not exist except within that relative perspective and that other types of constructions based on other kinds of sciences dealing with locomotion are used by other forms of life in other sorts of universes, but we will never find them in a spaceship. Given the theoretical and practical obstacles to conventional physical space travel imposed by special relativity (e.g., the speed of light, time dilation, prohibitive rocket fuel requirements), a new science of space travel may be required—one not limited to physical vehicles—that divests consciousness from the physical body for journeying from one remote galaxy to another in an out-of-body condition.

The other part of the problem involves the limits of human conception. Many contemporary discussions of consciousness tend to construe awareness and cognition as always being embodied in flesh (Shapiro, 2019) and that all experience is not only localized but also the outcome of microscopic electrical and chemical actions and idiosyncratic interactions of large neuronal networks within the brain (Uttal, 2011). Whether this is an accurate interpretation and appraisal of the facts remains a controversial issue (Cunningham, 2011; Nahm et al., 2017; Wahbeh et al., 2022). Many individuals, under certain circumstances, have spontaneously experienced "the subjective awareness that part or all of one's conscious



awareness is in a special location outside the physical body” (Neppe, 2011, p. 77)—a phenomenon known as an “out-of-body experience” (OBE) that has been extensively documented in databases at the OBE Research Foundation (<https://oberf.org/>), the Monroe Institute of Applied Sciences (<https://www.monroeinstitute.org/>), and the Near-Death Experience Research Foundation (<https://www.nderf.org/>).

The etiology of OBEs has long been a subject of debate (Alvarado, 1989; Blackmore, 1982; Cardeña & Alvarado, 2014; Metzinger, 2005). Part of the difficulty lies with OBE-like experiences that have dissimilar causes, contents, contexts, and phenomenologies being conflated, similarities being overemphasized, and differences ignored or overlooked, which has arguably given rise to incompatible theories, misleading deductions, and misinterpretations of what is experienced as an OBE. No single model, mechanism, or level of analysis—psychological, neurophysiological, pathological, or paranormal—is capable of unambiguously accounting for the full range or complexity of induction methods, precipitating factors, situational contexts, personality characteristics, phenomenological qualities, physiological involvements, and therapeutic consequences associated with OBE-like phenomena (Irwin, 1985; Sellars, 2018), especially their transpersonal meaning and transformative potential (Shaw et al., 2023). OBEs are extremely complex phenomena, and all experiences are highly individual (Moix et al., 2025).

OBE is a challenging phenomenon to scientifically study not only because of the complex character of the subject matter but also because many scientists tend to vigorously oppose the idea of its very existence and any philosophy that brings such a phenomenon into focus. While some scientists have begun to think seriously in terms of a “transcendent mind” (Barušs & Mossbridge, 2017) and “mind beyond brain” (Presti, 2018), such a possibility profoundly disturbs other scientists because it shatters the foundation of their philosophical stance. A self that is conceived of as a physical composition would never be able to project out of the body, much less survive bodily death (Martin & Augustine, 2015).

Unless OBEs can demonstrate definite consistencies that bring into focus a pattern of experience and content that can be checked through repeated observation in the experience of others, it is doubtful that modern orthodox scientific thinking will consider OBEs to be anything more than a private and personal daydream or hallucination, a neurotic aberration or an indication of incipient schizophrenia,

an imaginative fantasy or outright confabulation (Caruthers, 2018). This is why the pursuit of evidential data is so important, and the accumulation of reliable, reproducible, and verifiable collective observations through careful analytical experimentation is essential if the prospect of out-of-body space travel is to be seriously entertained by scientific communities.

STATEMENT OF HYPOTHESES

Drawing upon the philosophical psychology of Jane Roberts (1975, 1997-2002), I previously advanced and defended the *interdimensionality hypothesis* as one solution to Fermi’s Paradox: Intelligent life of an entirely different nature resides not only elsewhere within the physical universe as we know it, but also exists simultaneously outside of that framework in the same space as our own on other dimensional life planes and make contact with our own specialized spacetime continuum at points which serve as doorways through which NHIs may travel (Cunningham, 2025). If one is willing to temporarily suspend disbelief in such a possibility and curious enough to entertain, without necessarily endorsing, the proposition that certain UAP sightings may represent contact with visitors from alternate dimensions beyond spacetime as we know it, then the further question raised by Baker and Murad (2003) requires an answer: How do we locate and travel into these other “sequences of realities” or parallel universes in order to make UAP sightings less accidental and contacts with NHI more planned? This essay addresses that question.

On the present theory, any far-ranging space travel within our own physical universe or interdimensional travel between planes will involve mental rather than physical journeys and will be done through the projection of consciousness out of the body. By hypothesis, all such projections involve literally an extension of identity and self, only this time in realms where the physical body cannot follow, and the usual limitations set upon the self by the mental ego and physical senses vanish. There are no limitations to the types of projections that can occur, basically speaking, for there are no limitations to the self and an out-of-body projection is an extension of the self.

INTERDIMENSIONAL TRAVEL IN THEORY AND PRACTICE

The argument advanced and defended is this: Although our species may journey within our own relatively isolated solar system using physical vehicles, any efficient large-scale expedition and effective breakthrough in space travel



beyond it will involve mental travel utilizing what could be called “conscious energy transference” facilitated with or without the mechanical assistance of those points where other interdimensional life planes coordinate and meet our own. Mentally, we can cut through time and space in a way that physically we cannot. Further questions naturally arise: How might such a possibility be investigated? What sort of ideal study could be designed that would put the hypothesis of intergalactic and interdimensional travel in an out-of-body condition to the test of personal experience, scientific experiment, and further development? This issue is addressed next.

Participants

Intersystem travel, if it is to become practical at our end, will require the training and development of out-of-body abilities to a very high degree. One way to begin is to utilize purposive sampling instead of random or convenience samples and draw upon the developed talents of individuals who are already capable of subjectively experiencing high levels and intensities of classic out-of-body perceptions, insights, and affect (i.e., lucid perception of one’s own body as if from a distance, clear understanding of the self as existing completely outside one’s body, strong emotional impact and vivid sense of the reality of the experience, and personal meaningfulness of the epistemic content conveyed during the OBE; Gabbard & Twemlow, 1984; Sellars, 2017). Screening questions could assess for personality traits related to OBE identified by prior research (e.g., capacity for dissociation, attentional absorption, hypnotic susceptibility, imaginative involvement, curiosity, paranormal belief, transliminality, openness to experience; Gow et al., 2004; Myers et al., 1983; Parra, 2018).

By hypothesis, the extent of interdimensional travel is determined by one’s ability and, as a rule, excursions will be along the lines of one’s own development. If one’s curiosity and creative abilities make the personality flexible enough so that learning can take place, then one is in a good position to consciously explore the experience of an out-of-body condition. The idea is to remember that the same resources which serve so well in daily life—an intelligent, curious, and reasoning conscious mind; a strong, confident, and flexible personal ego; disciplined effort balanced with creative spontaneity—are needed in such explorations. If one has faith in oneself, is fairly competent and content with one’s life, curious and open to new ideas, and not overly dependent on specific religious or scientific dogmas for explanations of what one experiences, then

one should have little difficulty and no artificial difficulties need occur.

What will be required is a partial letting go of ego defenses and inhibitions in a personality structure that has a strong yet resilient framework and is capable of temporarily dispensing with its boundaries to allow a secondary center of consciousness (or what could be called the “inner self” that is beyond ego) its freedom, yet strong enough to spring back and maintain conscious control over sensory experience in order to communicate what was experienced. The main obstacle to gaining the information that one seeks is *fear*—fear of the unknown, fear of losing control, fear of being lost in or subjugated by the experience, fear that one might die or be unable to return to the body. Yet as Monroe (1977) reminds us, “unknowns are feared only as long as they remain so” (p. 105). The ultimate goal is to learn that it is possible to maintain use of the here-and-now awareness of the conscious mind freed from the encumbrances of the egoic self and sensory input of the physical body following a prerequisite tuning-in of consciousness.

Repeated experiences with OBEs through intentional practice and self-experimentation can help dissolve the fear barrier. Head-mounted virtual reality (HVR) technology could be helpful in this regard. Portable VR devices have been used to artificially induce a variety of body-ownership illusions and dissociative-like experiences resembling an OBE (e.g., feelings of detachment from one’s body and observing it as if from a distance; Bourdin et al., 2017; Chen et al., 2024; Martial et al., 2023; van Heugten-van der Kloet et al., 2018). They offer a promising experiential learning tool for introducing OBEs to potential *psychonauts* (after Grof, 2019) who are new to the idea of self-awareness existing outside of the physical body and transforming what may be initially a strange and frightening experience into a more familiar and normalized one. Skill in communicating during and after OBEs could be developed through training in the use of both concurrent and retrospective verbal reports (e.g., Ericsson & Simon, 1984) and in learning how to speak while in an alternate state of consciousness without disrupting the out-of-body condition (Cunningham, 1986).

Induction

In addition to the use of experimental protocols already designed to elicit reliable, reproducible, and verifiable OBEs under controlled laboratory conditions (e.g., Osis & McCormick, 1980; Tart, 1998), other theoretically grounded



and ecologically valid techniques for facilitating interdimensional consciousness travel and NHI communication could be put to the test of experience and experiment (e.g., Buhlman, 1996; Hollier, 2023; Monroe, 1977, 1985; Vieira, 2023). These would include hypnotism, psychedelic drugs, and magnetic stimulation of the brain.

Hypnotism

The very simplest and crudest but still to be adopted method for eliciting an out-of-body condition would be *hypnotism* (Terhune & Cardeña, 2009). Structured protocols for cultivating hypnotically induced OBEs augmented by trance channeling states of consciousness may prove particularly effective (e.g., Pederzoli & Tressoldi, 2018; Pederzoli et al., 2020; Wahbeh et al., 2025, Appendix). A self-projection can be attempted by inducing a medium trance in whatever way one chooses (e.g., self-hypnosis with indirect, permissive suggestions) or when one already feels pleasantly physically drowsy. Eventually, the use of other methods divested from hypnosis could be used, involving certain mental disciplines (e.g., meditation) and psychotechnologies (e.g., sensory deprivation, ganzfeld stimulation, Monroe techniques, dream control) that permit the perception of data free from the camouflage distortion of the physical senses.

Psychedelic Drugs

Another method for catalyzing an out-of-body condition suitable for interdimensional travel draws upon the chemical assistance of *psychedelics* (Nichols, 2016; Roberts, 2019). The chemical doorway is indeed a doorway. On the present theory, there is a class of drugs related to the alkaloid family of chemical compounds (e.g., tryptamines, phenethylamines, lysergamides) that release certain barriers which stand between the material body and its more mental forms. By hypothesis, the chemical used will largely determine the systems that may be explored. The effects of these drugs would seem to be hallucinatory but would represent quite valid journeys into other realities.

Reported encounters with a variety of NHI beings following ingestion of the substance N, N-Dimethyltryptamine (DMT), for example, are instructive and explainable within the framework of an interdimensional universe construct (Lawrence et al., 2022; Strassman et al., 2008). DMT entities are commonly experienced as having their own subjective existence and being aware of their world within the context of a generalized reality orientation that is different

from our own (Davis et al., 2020). To reject without further consideration the possibility that such shared experiences may offer collective evidence for the existence of a “tryptamine” dimensional plane may be unjustifiably discarding an inference to the best explanation of the data that better fits accounts of the experience than explanations which eliminate the psychical element of consciousness entirely from the causal nexus. The prevalence, vividness, intensity of phenomenology, and strong self-validating sense of facticity and realism of entity encounters that are catalyzed by this and other psychedelic drugs arguably count as evidence for the face validity of such encounters (Grof, 2009; Luke & Spowers, 2018).

One drawback with the psychedelic approach is that the electromagnetic and chemical changes brought about by such outside agents as drugs, to some degree, rob the traveling consciousness of its usual directive abilities because the changes occur before the traveling consciousness has had time to gather itself together and is not as psychically organized as it is in OBEs without drugs. Consciousness on its own has a larger choice and more maneuverability in a drugless experience because it brings about the chemical and electromagnetic changes itself as it travels, the chemical changes being byproducts of the mobility of consciousness rather than the catalytic action of the drug.

Transcranial Magnetic Stimulation

Another possible method for assisting in the induction of an out-of-body condition suitable for interdimensional travel involves the application of Transcranial Magnetic Stimulation (TMS). The effect of TMS on body perception remains a controversial issue (Daltrozzi et al., 2016). Case studies involving the application of direct electrical or magnetic stimulation to certain areas of the right hemisphere of the brain (e.g., motor cortex, temporo-parietal junction) indicate that such brain stimulation is capable of both inducing and disrupting the production of OBE-like mental imagery (e.g., disembodiment, autoscapy) and bodily sensations (e.g., floating) in some individuals (e.g., healthy volunteers, patients with epilepsy or intractable tinnitus) (e.g., Blanke et al., 2005; De Ridder et al., 2007). Other research demonstrates a heightened sensitivity of the right hemisphere to ambient magnetic and geomagnetic activity during experimentally applied TMS of the right-hemisphere (Mulligan et al., 2010) which, in turn, has been positively correlated with reports of successful out-of-body projections (Persinger, 1995), feelings of a “sensed presence” interacting with one’s own self (Booth

et al., 2005), and telepathic and apparitional experiences (Persinger & Schaut, 1988).

The precise meaning of this neurophenomenological profile, however, is uncertain. It has led some investigators to conclude that all OBEs are simply complex pathological illusions caused by impaired visual body processing in right temporal-parietal regions of the brain reflecting a failure to integrate proprioceptive, tactile, and visual information of one's own body that results in the production of deficient body representations by the different sensory systems (e.g., Blanke & Thut, 2007). Whether such appraisals of OBE-like experiences are an artifact of the experimental designs utilized, can adequately account for the neurological underpinnings of chemically- and hypnotically induced OBEs, or lead to a methodology that can reliably elicit reproducible and verifiable OBEs that are characterized by classic out-of-body phenomenology remains to be determined.

Separation

Whatever the technique used, after a suitable state of consciousness is induced, a separation of self-consciousness from the body can then be attempted. The preliminary exercise described by Roberts (1997-2002, Vol. 6) is illustrative. One examines one's own subjective feelings until one finds recognition of one's inner self—that is, a recognition of oneself as distinct from the fleshy body in which one resides—and imagines this self-rising upward with an internal sense of movement. As one gently shakes oneself loose from side to side, at a moment, one feels oneself, one's identity and consciousness, withdrawing from the body. Suggesting that the body will be well protected and comfortable, one forgets the physical body and what one is to do with it and wills oneself out in a quick motion.

If the separation process is successful, one will lose contact consciously with the physical body and instantly find oneself in what has been called the subtle body, psychic body, astral body, or "Second Body" (after Monroe, 1977, Chapter 13). The Second Body is an *idea form* with which people are most familiar during their experience of ordinary dreaming. The dream body strikes one as being physical in shape, though one can do things with it that one cannot do with one's physical body. Some sort of body is always adopted as a mental vehicle because people generally cannot think of identity without some kind of physical body—which is one reason why mediumistic and channeled communication from discarnate personalities is so difficult to accept as real.

Exploration

Once separation occurs, during the "time out" period and utilizing the body's atoms and molecules as stepping-stones to a given destination, the psychonaut re-forms their body image on another plane in camouflage form. Having a form somewhere between matter and nonmatter, the projecting body possesses an atomic structure, but one less complete and more diffuse than the physical form. Within the physical system, the projected form would manifest as a kind of pseudo-image that sets up small physical disturbances whose electrical properties can be sensed by animals. Within other systems, projected consciousness may appear as an apparition in a non-solid form in the same way that a cloud is not solid and yet has a shape and, to a certain extent, boundaries and movement. In basic terms, the body does appear at a new location but does not travel between two points as a physical vehicle might do. One is simply operating in a different dimension where time, as we know it, is simply ignored as an element. By hypothesis, it takes no time for one to journey using the instantaneous mobility of consciousness.

Although Monroe (1977, 1985) does not make this distinction, several different nonphysical body forms will be adopted which are adapted to meet the particular requirements of the nonphysical environments in which they are used, and that can be a tip-off as to the interdimensional plane in which one finds oneself and the rules that apply. One may begin a projection in one form and then project it to another (Tressoldi et al., 2015). For far journeys within other reality systems, a number of transformations in body forms must and do take place, since the physical connection will only allow one to go so far. All forms are equally real, even though they do not exist in a manner that physically oriented science endorses as real, and they operate on interdimensional planes that, as a rule, cannot be perceived using exterior senses which have evolved only to perceive physical reality.

Operationally, teams of OBE adepts, acting independently, would make the transition from an interdimensional contact point on plane A of our own physical universe to a contact point on plane B of scientific interest, collect the observations that are wanted, and then transit back to communicate their findings. Tart's (1975, 1997, 2008) state-specific sciences paradigm grounded in the essential principles of science—that is, objective observation, consensual validation, logical theorizing, and observable consequences leading to testable predictions—would be one



scientifically sound approach to correlating the data that has been obtained utilizing various “contact modalities” (Hernandez et al., 2018).

Telepathy, Dream States, and Time Travel

Exploration can proceed in any number of directions, and modes of NHI contact and communication can occur in any number of ways. Swann (2020) and Ibison and Hathaway (2011), for example, provide accounts of the ostensible use of telepathy as a means of making contact and communicating with NHIs who exist within what could be called the “horizontal” level of our own physical universe. By hypothesis, telepathy will enable our species to make its first contact with alien intelligence, but it will not at first be recognized as such largely because the existence of psi (or inner sense perception) as a mode of communication continues to be a matter of debate (Cardeña et al., 2015; Krippner & Friedman, 2010; but see Cardeña, 2018; McLuhan, 2010; Radin, 2013). Because the human species is so reliant upon a physically oriented, sensory-dependent mode of waking consciousness, telepathic contact with such intelligence will be a startling discovery.

On the present theory, it is possible for an individual in some dream states to visit other planetary systems. Contact with NHIs via out-of-body encounters is more feasible in the dream state where the human species’ natural fear reactions would be somewhat minimized and the danger of attack to visitors far less. Such visits are usually spontaneous and fragmentary at the present time, and it is perhaps best that they remain so, since there are many difficulties involved and because it takes a good deal of competence to operate with any real effectiveness within these situations in an out-of-body condition (e.g., Monroe, 1977, 1985).

The question of whether a person can travel into the past is not only a philosophical one, but also a question of physics (Arntzenius & Maudlin, 2002; Krasnikov, 2018; Toomey, 2007). On the present theory, moving into one’s own future and into the past occurs regularly, though not always with awareness. The curtain between the present and the past is only an apparent division between planes through which beings who reside in other reality systems have also come—sometimes on purpose and in a planned way and sometimes completely by accident—usually being invisible to inhabitants of our plane. In some cases, human beings who quite accidentally blunder into the apparent division between one plane and another while in an out-of-body condition may actually fall into the apparent past, invisible to the people of the past they visited.

CRUCIAL OBSERVATIONS AND EXPERIMENTS

Theories of OBE—whatever their source—will always retain an element of speculation and remain difficult to test through intersubjective observation. What about Roberts’ theory of interdimensional consciousness travel? Does it connect with other related observations and theoretical frameworks? Does it have observable consequences that lead to testable predictions? On the present theory, certain electrical fields will make themselves known when they are being crossed at the very point of departure and return in an OBE that would be reflected in particular patterns of physiological data (e.g., muscle tone, pulse rate), brain wave activity (Facco et al., 2019; Persinger, 2010), electrochemical activity (e.g., galvanic skin resistance), and psychological processes (e.g., awareness, intention, memory). Such interactions of consciousness and the physical body are obviously possible and inherent in the body structure; otherwise, they would not occur.

Consciousness could not leave the body and return to it again unless there were a system of physical properties, biological mechanisms, and psychological states that allowed such a performance. On the present theory, if life in the body is to be maintained within the framework of physical existence on the Earth life plane, then the main consciousness must return to it. This does not mean that consciousness is dependent upon the physical organism but that the physical organism is dependent upon consciousness. Although the body is not lifeless, if an out-of-body projection is successful, then one’s self-consciousness simply will not be in it, and the body’s maintenance will be controlled and guided by the generalized consciousness and condensed knowledge of its individual cells and organs.

Electrochemical

The physical body is maintained, yet certain changes must come about in the physical organism before projection can occur that are the result of certain electrochemical activity. By hypothesis, the excess chemicals that usually build up as a natural byproduct during periods of waking consciousness in daily life and that are released through sleep and dreams constitute an important propelling force for out-of-body projections in interdimensional travel. Yoga exercises, when faithfully executed, allow a person to draw a superabundance of energy that results in chemical excess, which also can be utilized in projections (Radin, 2013). Because one is literally traveling from one life plane

or reality-energy system to another, a strong propelling action is required, and this chemical excess provides that fuel. The chemical excess built up during the day that provides a fuel for OBEs is ordinarily used in the dreaming process, which is one reason why conscious projections happen rarely from the dream state.

On the present theory, the best times to try projections when a more than normal amount of this chemical fuel accumulates and is released include periods of exuberant energy and well-being, intense activity of a mental nature, momentary indisposition when the dreaming process may be blocked, and the period just before the menstrual cycle. For various reasons, the period of the full moon is most beneficial. A small amount of sugar or starchy food can be helpful before conscious projections due to a "thinning out" of certain molecules in a form not normally seen. Citrus fruits are an aid because of the acid, which has electrical properties. The drinking of pure water also facilitates projections. Alcohol may be of some benefit, though not to any great degree. Certain temperature conditions are predicted to facilitate projections. A cool body temperature and a room temperature between 73.8 and 75.10 are helpful, whereas high humidity and too-warm weather are detrimental. This has to do with electrical currents about the skin, sweat on the body, and the saline composition of the body at various times of the year.

Physiological/Neurological

Physiologically, a strong infusion of adrenaline, an increase in thyroid gland activity, and a rush of sex hormones are predicted to occur as projection is achieved. The rapid eye movements usually observed in the dream state cease entirely. The normal muscular activity that occurs in sleep also vanishes as the physical body enters a deep trance state that may be masked by sleep if the projection occurs from a dream state. After projection is accomplished, there is a marked decline in this chemical activity and hormonal action, and a drop in body temperature and blood pressure. There is also a minute difference in the physical body's normal weight. According to the intensity of the projection and depending on the systems visited, the physical body becomes more or less rigid when consciousness returns to it.

Neurologically, the intuitive right-hemisphere functions of the brain are predicted to show greater activation during the travel period itself when the non-physically oriented portions of consciousness are absent from the body. The physically oriented left-brain portions of consciousness

that remain with the body would display less activity. This bifurcation of consciousness would be reflected in oscillatory activity between the left medial prefrontal cortex and angular gyrus in right temporal-parietal junction regions of the brain when the individual is projecting (Bünning & Blanke, 2005; Zeev-Wolf et al., 2017).

By hypothesis, conscious projections are more easily executed when the body lies in a north-south position (i.e., head facing *magnetic* north). The reasoning parts of the brain can work most efficiently along with the intuitive portions of the self when the physical body is in that position. Utilizing a magnetic compass to confirm optimal north-south orientation, the whole organism operates more effectively, generally speaking. This has to do with the magnetic properties of the molecules of the body and their more efficient alignment with the Earth's magnetic field flux lines. Whether these hypothesized facilitative effects are due to the presence of coordinate points where interdimensional planes meet at the Earth's north and south magnetic poles (i.e., where the planet's magnetic field flux lines converge) remains to be determined.

Psychological

On the present theory, spontaneous out-of-body projections happen more or less constantly to every person, even while awake. Conscious projections (i.e., projections of which one is self-consciously aware) do not occur with any frequency, however, as far as a large percentage of the population is concerned. An almost automatic determination must be set up if projections with conscious awareness are to be anything but rare oddities. Waking consciousness only participates in projection, as a rule, when one is in a period of high vitality and exceptional health and projections are spaced out in alternating periods of activity and quietude and rest. On occasion, the waking consciousness does participate during very depressed periods, although generally speaking, very high energy is needed in order to maintain the overall stability of the experience. Whether or not projections are conscious, they occur in any case, and the personality learns from them.

A projection may make little impression upon waking consciousness unless the personal ego is taken along as far as it can go so that the person's reasoning mind is able to translate the OBE at least in part and later serve as an interpreter. Without such translation, the conscious mind will not be able to contain the data, and the traveling consciousness will have little memory of the experience since much of the experience would remain uninterpreted. One's



critical faculties should be used when projecting but should not be emphasized too strongly; otherwise, the OBE will be terminated. There is a point where the personal ego will be left behind, but each time it will go further.

The importance of conscious projections in interdimensional travel and effective NHI communication raises the question of whether training in conscious control of one's dreams (i.e., lucid dreaming [LD]) is an effective method of OBE training. OBE and LD share important similarities (e.g., control over a non-material environment, self-awareness, subjective feeling of existing apart from the physical body; Mallett, 2025). The use of eye movements as a time marker to signal the onset of an OBE from the dream state, if reliably established, would represent an important methodological development in the science of out-of-body projectiology (Weiler et al., 2025). OBEs are not simply LD dressed up in different clothes, however (Weiler et al., 2024). On the present theory, OBE and LD are different kinds of experiences that involve a different chemical process, state of consciousness, phenomenology, and behavioral indicators, as well as a wider range of sensory and memory experiences and a conscious recognition not that one is dreaming but that one is *not* dreaming (Gallo et al., 2025).

As documented in Monroe's (1977, 1985) longitudinal case study of his personal journeys out of the body, a "Second Body" OBE involves another frame of reference with a different kind of organization than that of either normal waking consciousness or dreaming. OBEs deal with non-material environments and realities in which the durability of images is far different than in the dream state. One is much more aware of the shifting guise of materialized images and of the mental energy that gives all objects their existence. The person, to some degree, has to learn conscious control amid a conglomeration of energy forces that have no objective form and work through the challenge of interpreting the reality of events of which one is a part and that are layered over with one's own personal private symbols without taking those for the "real" environment.

COORDINATE POINTS—WHERE THE MULTIDIMENSIONAL UNIVERSE MEETS OUR OWN

By hypothesis, when out-of-body interdimensional travel becomes truly practical, it will come along these lines and tap into the generalized consciousness and

condensed knowledge of the atoms and molecules of the body powered by the catalytic action of consciousness. This development, however, remains only a probability rather than immediate possibility. Egoic fear of its own deep subconscious is all that holds the species back. Once the fear barrier is deconditioned through greater familiarity with OBEs and the powerful motive force of curiosity is allowed free rein, then a technological way of making interdimensional travel possible may very well be worked out with or without the mechanical assistance of *coordinate points* where other "reality-energy systems" (Monroe's term) impinge upon the spacetime framework of our own physical universe.

There are different types of coordinate points. There are absolute coordinate points where all realities coexist, overlap, and coincide with one another; main coordinate points that are mathematically pure sources of enormous energy; and subordinate coordinate points that are vast in number. Coordinate points—absolute, main, and subordinate—form a part of every life plane, reality system, and existence field and, because there are no closed systems, within any given set of coordinates there will be others. These points of "double reality" have an electromagnetic structure and exhibit physical effects that can be detected using both objective instrumentation and subjective tools in those regions of space—both on and off the planet—where the interdimensional environment is strong. As the Earth is moving through the solar system, for example, the planet will encounter coordinate points in interstellar space. It is very possible that one might end up in what one intends as a physical space venture only to discover that one has traveled to another plane, though at first one will not know the difference.

By hypothesis, coordinate points represent rifts in our four-dimensional spacetime continuum that serve as entry and departure portals through which NHIs may travel from one reality-energy system to another. Some of these rifts are geographic, but in all cases a tuning-in of consciousness is a necessary preliminary, and travel from the Earth life physical plane to a different reality-energy system can generally only be made in an out-of-body condition. Coordinate points, besides having an electromagnetic structure, are also something like living subjective projections that take up no room and are more like an emotional state than a specific geographical location. Coordinate points would have a physical aspect and a nonphysical aspect, in those terms.

Nature and Function of Coordinate Points

As electromagnetic structures, coordinate points can be likened to dark matter/dark energy and act as natural energy generators and accelerators that amplify the highly charged vital energies necessary for the continuous creation of matter in the physical universe (Friedman, 1994, Chapter 15). Acting as additional energy sources for the physical system and serving as channels for pure energy to flow from one life plane or reality system to another, coordinate points generate ever-so-minute alterations of gravity forces. Their existence can be inferred on the basis of indirect evidence of other things that are observable and can be mathematically deduced. Physicists are predicted to stumble upon the mathematical probabilities involved in the existence of coordinate points and similar interdimensional rifts in their attempt to obtain more data about black holes related to an idea connected to Einstein's general and special relativity theories (Alexander & Hickox, 2012).

By hypothesis, coordinate points have somewhat the same qualities as miniature "black holes" and "white holes" but with one important exception: The white hole is *within* the black hole. Unlike conventional white holes (Haggard & Rovelli, 2015), this white hole is the exit of a black hole, not at a different part of the universe but in the same spacetime coordinate as the black hole. No wormhole, in the usual sense of the term, is thus required to connect two different points or planes to the same coordinates of different dimensional planes. They are two united, not separate, interior regions of maximally extended spacetime. The black hole portion of coordinate points is the attractor and collector of mass-energy. From the region of the white hole, space and time are continuously created.

Acting as something like living subjective projections, coordinate points tap into the electrical and chemical energy of intense thought and emotion. This energy is drawn into and through these coordinate points, momentarily disappears, and becomes immeasurably accelerated on another dimensional plane. Drawing additional energy from other systems, the original mass-energy is changed by intensifying the points of pure energy within it, including those properties of matter familiar to physicists, revitalizing the electromagnetic nature of the atoms and molecules involved. The accelerated, magnified energy is then directed back into the physical plane, returning through the same coordinate point via the white hole at the same location of the black hole from which the energy formerly came. A physical vehicle, such as the modern-day

spaceship, could never survive that kind of exit and reentry from the physical system and is one reason why future space travel will likely require the use of nonphysical rather than physical transportation vehicles.

CRUCIAL OBSERVATIONS AND EXPERIMENTS

All this is fine in theory, but is it an accurate representation of the facts? Up to this point, the prospect of out-of-body interdimensional travel utilizing conscious energy transference with or without the mechanical assistance of coordinate points remains only the most speculative of theories and what Baggott (2013) called "fairy-tale physics" (i.e., a highly speculative physical theory not yet grounded in empirically verifiable data). Where does one begin to look for empirical evidence that these hypothesized coordinate points actually exist? What can one observe and measure once an area of possible coordinate point activity has been identified? These questions are addressed next.

Where to Look: Databases of Recurrent UAP Sightings

Since coordinate points are hypothesized to be localized regions where UAP are presumed to enter and exit the spacetime framework of our physical universe, one place to begin the search for their location would be authoritative UAP databases that document sites of recurrent UFO activity (e.g., three or more sightings in the last 60 years). UAP databases to consult might include the Allen Hynek Center for UFO Studies (<https://cufos.org/>), Mutual UFO Network (<https://mufon.com/>), National Aviation Reporting Center on Anomalous Phenomena (<https://www.narcap.org/>), National Investigations Committee on Aerial Phenomena (<https://nicap.org/>), National UFO Historical Records Center (<https://nufohrc.org/>), and National UFO Reporting Center (<https://nuforc.org/>).

Using information contained in the National UFO Reporting Center online database, for instance, Coumbe (2023) analyzed the distribution of UAP reports per capita in the United States and concluded that "the average person reports more UFOs in the northwestern and northeastern states than in the central states, far from the coast" (pp. 98-101). Teodorani (2009) pointed out that such data points almost always refer to the position of the observer who saw the UAP and not the actual position of the UAP that was observed. Given this caveat, UAP/UFO databases and maps (e.g., <https://uapsightings.org/database/>; <https://nuforc.org/map/>) could be used to pinpoint best probability target areas of strong coordinate activity.

Prime target areas to begin investigations would be locations where thorough witness interviews and on-site monitoring operations have already been conducted that are supported by photography, radar, video, and other physical evidence.

Teodarani (2024, Table 1) identified locales around the world where recurrent UAP-like phenomena occur that may represent areas of strong coordinated activity. These include Argentina (Capilla del Monte and Victoria, Entre Ríos), Australia (Boulia), Brazil (Colores), Italy (Caronia), Norway (Hessdalen), Romania (Hoja Baciú), and Russia (Molebka M-Zone). The anomalous luminous phenomenon known as the “Hessdalen Lights” that recurs in the Hessdalen valley in Central Norway and at other global locations, for example, could be an effect of *angles* formed by two or more coordinate point energy sources (Teodorani, 2004).

On the present theory, geographic regions of strong coordinate activity in the United States would include areas on both the West Coast (e.g., Mount Shasta, Malibu, and Topanga Canyon [CA]; Yakima reservation [WA]) and the East Coast (e.g., Pine Bush and Hudson River Valley [NY], Brown Mountain [NC]). Southern locales (e.g., Gulf Breeze [FL], Marfa [TX], Quapaw [OK]) and southwestern regions (Sedona [AZ], Taos [NM]) are other target areas. Midwestern states such as Utah (Uintah Basin) and Missouri (Piedmont) and areas around the Great Lakes and Chicago and Minneapolis would be other locations. Teodorani (2009) identified the well-investigated area of Pine Bush and surrounding regions of the Hudson and Wallkill River Valley as “the most important ‘area of probability’ for UFO sightings” in New York state and surrounding Connecticut (p. 50).

The Hudson Valley in New York state, for example, has been the subject of scientific study over several decades (Hynek et al., 1998; Polise, 2005) and geophysical data are already available to guide investigations (e.g., magnetic and gravitational field anomalies, fault lines, seismic/volcanic activity; <https://worldwind.arc.nasa.gov/>). The town of Brewster and locations in Putnam County—including regions between the towns of Kent Cliffs, Putnam Valley, and Carmel, and the isolated area in southeast New York called Reservoir Road and nearby upper and lower Magnetic Mine Roads—would be promising target areas for further study in that respect (Imbrogno, 2008, pp. 124-135). Knowing the precise locations of possible coordinate activity within a radius of 10-50 square miles at other locations of recurrent UAP sightings is a topic awaiting further research.

Geophysical Indicators

In addition to locations of recurrent UAP sightings, natural geophysical anomalies that currently resist scientific explanation can also inform the identification of possible areas of strong coordinate point activity. This would include the non-seismic pre-earthquake phenomena reported by Freund (2003), such as

the bulging of the Earth’s surface, changing well water levels, ground-hugging fog, low frequency electromagnetic emission, earthquake lights from ridges and mountain tops, magnetic field anomalies up to 0.5% of the Earth’s dipole field, temperature anomalies by several degrees over wide areas as seen in satellite images, changes in the plasma density of the ionosphere, and strange animal behavior. (p. 37)

Magnetic anomalies in the proximity of stone chambers and standing stones throughout the US northeast may also be a sign of coordinate point activity (Imbrogno & Horri-gan, 2005).

By hypothesis, anomalous weather phenomena on land (e.g., mini tornadoes, dust devils, ball lightning) and at sea (e.g., waterspouts, swirling clouds, electrical storms) are magnified in the neighborhood of angles formed by coordinate points. Given the anomalous weather phenomena and magnetic field dynamics displayed at the Earth’s polar regions (i.e., highly charged electromagnetic properties, periodic geomagnetic pole reversals, wavering of gravitational forces, drift of the magnetic North pole, and variability in the angle of magnetic and true North over time; Turner, 2011), the possibility that the Earth’s north and south magnetic poles constitute main coordinate points is a reasonable conjecture under the present theory.

Other indicators of strong coordinate point activity are more qualitative in nature. Material structures have greater stability in these areas than in others, such that roads and buildings last longer (e.g., the pyramids in Egypt). Plants grow and flourish better (e.g., Findhorn community in Northern Scotland). Potential for both constructive and destructive elements (e.g., illnesses, natural disasters, tornadoes) is high in a quite neutral manner and becomes more fertile in these environments. Particular health patterns (e.g., skin irritations, severe headaches, fainting spells, dizziness) are intensified in the neighborhood of the angles formed by coordinate points. All of the world’s great religions have their origin near the locations of major coordination points (e.g., Jerusalem, Mecca, Rome).



The Physics of Coordinate Points

Once a general area of suspected coordinate point activity has been identified for further scientific exploration, the next step would be to more precisely pinpoint the specific location of the coordinate activity using both objective instrumentation and subjective tools. By hypothesis, coordinate points are electromagnetic structures composed of packets of pure energy called “electromagnetic energy units” (EE-units) (see also <https://sethcenter.com/glossary-term/electromagnetic-energy-ee-units>). EE units do not generally follow the known laws of matter (e.g., laws of entropy do not apply), although they may mimic those laws, and possess the following characteristic features:

- **Electromagnetism and Gravitational Force**—EE units are free-wheeling electromagnetic structures that generate a highly charged electromagnetic field. They follow certain laws of magnetism (e.g., laws of attraction and repulsion) and possess both positive and negative charges. It is in terms of weather that their electromagnetic effects appear most clearly. EE units also generate ever-so-minute wavering of gravitational forces. Space “puckers” and “wrinkles” and seems to disappear in a manner that can be compared to a compression or crumpling up of electrically charged air.
- **Mass**—EE units have imaginary mass. Like massless neutrinos, EE units can pass through ordinary matter without detection. Like the hypothetical tachyon particle, EE units can travel backward in time. Unlike tachyons that can only travel faster than the speed of light, however, EE units are capable of slowing down below the speed of light as they approach the physical life plane and “explode” into the varieties of elementary matter particles and energy forces familiar to physicists. No two EE units are identical. It is impossible to detect single EE units, although they can combine into larger units whose effects are detectable.
- **Relative size**—EE units are physically minute in size to an extreme and smaller than any particle of which physics knows so far. Molecules would appear as large as planets to EE units, and there are many millions of them in one atom. The activity of atoms and molecules quickens as they approach EE units, while the relative distance between the atoms and molecules remains the same.
- **Variability**—EE units are continuously pulsating, oscillating, expanding and contracting, changing intensities and shifting polarities constantly. Each pulsation

of energy has a very brief “life” and flickers on and off too fast for the relatively slow human sensory system to be able to detect their ceaseless coming into and going out of the physical field, although at some time in the future scientific instruments may discover this interval.

- **Qualia**—EE units are absorbent and have thermal properties. They possess color and sound values outside the range of ordinary human vision and hearing.

These attributes of EE units have heuristic value in furnishing information to guide the selection of objective instrumentation and subjective tools for detecting areas of strong coordinate point activity (Friedman, 1994, Chapter 3).

On the present theory, because coordinate points are something like living subjective projections as well as electrical structures, the concentrated energy of EE units that compose them is activated by any emotional feeling or thought of sufficient intensity with which they come into contact, intensifying whatever activates them in a quite neutral manner, regardless of the nature of the feeling or thought—only intensities matter. It is the intensity of an emotion and concentrated focus of a thought that governs the relative strength of EE unit magnetic structure, rate of pulsation and shifting of magnetic poles, and power to attract, repel, and combine with other EE units. When of high enough intensity, EE units activate a coordinate point and, in turn, are themselves further activated and sensitized into further action by virtue of the proximity of the coordinate point. The energy remains dormant until then and cannot be activated physically, only opening up when concentrations of energy build up within the physical system.

What to Observe and Measure: Objective Instrumentation

By hypothesis, EE units represent a high-energy phenomenon capable of being distinguished from ordinary background energy phenomena by virtue of their electromagnetic (EM) frequency disturbance and high energetic particle emission. Because coordinate points are hypothesized to straddle ordinary and nonordinary spacetime and take on the camouflage appearance of the plane they contact, it will be a challenge to sort out spatial and temporal entanglements that unavoidably couple ordinary electromagnetic and anomalous EE unit activity (Dibble & Tiller, 2011). It is possible that what appears to be advanced UAP technology that defies known laws of physics, for instance,

may instead reflect the utilization of EE units linked with an overlooked natural, atmospheric energy source resembling those displayed by terrestrial tornadic vortices (e.g., high-voltage, plasma-based, electromagnetic and electrostatic fields; Beck & Coli, 2025; Hill, 1995). The most crucial observations would involve the measurement of anomalous magnetic fields and utilization of sensitive magnetometers for detecting and measuring pulsating electrical/magnetic/gravitational disturbances.

For this reason, a multi-modal approach and utilization of a wide range of observational and recording instruments is recommended (Cloete et al., 2023; Watters et al., 2023). This could involve the utilization of optical and infrared cameras for photometric and spectroscopic analysis, electromagnetic and gravitational spectrum analyzers, and radioactive particle detectors. The use of portable instrumentation and astronomical techniques interfaced with a digital computer that permit the recording and high-speed processing of data on EE unit parameters, which lends itself to in-depth analyses, could lead to a fuller understanding of the physics of coordinate point activity (Teodorani, 2024; Teodorani & Strand, 2001).

Subjective Tools

Coordinate points are everywhere, impinging upon flora and fauna in the physical environment constantly, but because they are unperceived by the physical senses, they go unrecognized and are not consciously understood. The main requirements for perceiving them are an intentional shift in the focus and direction of attention and a tuning-in of consciousness to their activity. Otherwise, only momentary and accidental encounters with them ever occur as far as the conscious mind is concerned. Because coordinate points are living subjective projections, there are ways of subjectively feeling the approach of certain coordinates as they are projected onto the physical system of the Earth life plane. They are felt phenomenologically as intensified energy that will seem to be stronger during certain times than others (Imbrogno, 2008, Chapter 6).

Roberts (1972, pp. 452-454) reportedly drew upon the energy of nearby coordinate points in her work. She describes a technique that utilizes the body's somatic "felt sense" as a subjective tool for detecting the neighborhood of strong coordinate point activity that somewhat resembles the procedure for setting up a "vibrational state" conducive to eliciting an OBE outlined by Monroe (1977, pp. 212-213). With intention set firmly in mind, awareness is allowed to wander until an inclination to move toward

a particular direction is subjectively felt. Visualizing an imaginary line drawn from the center of the forehead that is joined by another line projected from the top of the head, both lines are projected outward in the same direction. Where the lines converge to form an angle points in the direction closest to a coordination point. Using this method, Roberts described how she was able to identify the nearest subordinate coordinate point as being located inside the wall in the southwestern corner of the room at her home in Elmira, New York during a Seth/Jane possession trance session, while also noting that a different coordinate point was located in another direction when she was in a "Seth Two" trance state.

A Philosophical Turn—Metaphysics of Interdimensional Travel

If the preceding account of out-of-body interdimensional travel, probable coordinate point locations, and characteristic features of EE units is coherent, still it does not identify the metaphysically prior background conditions that make these phenomena possible in the first place. The claim is that these phenomena exist, but why and how they exist needs to be briefly explained (see Cunningham, 2013, for further details).

Roberts's philosophical psychology posits the existence of a form of pure *aware-ized* energy called "consciousness units" (CUs) as the proximate causal force behind and yet within all EE units that compose coordinate points, and that makes interdimensional travel possible. Operationally, CUs represent a fundamental proto-experiential form of awareness that exists simultaneously in both particle and wave form. As particles, CUs take on the characteristics of particularity, build up continuity in time, possess specific boundaries taking certain forms, and express their action from the center of these forms. At other levels, CUs operate as waves and spontaneously exist at all places at once without traversing through space and thus have the property of nonlocality. Each CU inherently possesses within itself all of the information available to every other CU, resembling what a hologram is thought to be (Talbot, 1991). It is upon this great body of inner "wave" knowledge that their specific nature as particles rests. All of the physical universe is interconnected to this extent.

Certain intensities of CUs are built up into organized gestalts even before the smallest particle of matter exists, and from their inner organization all physical forms and identities emerge. At some indescribable point, the faster-than-light units of consciousness slow down as they

approach the physical plane and explode in a transductive process into *electromagnetic energy units* (EE units), the proximate root of physical matter. EE units are CUs that have begun the special selectivity and screening process necessary to bring about a particular physical form. EE units represent the stage of emergence and threshold point that practically activates the CU in material terms.

EE units themselves can operate as either particles or waves as CUs do but are closer to physical orientation, combining in their own fashion to specialize in the various elements that form the most microscopic physical particles, and that permit the production of atoms and molecules perfectly suited to the natural world. The hidden “implicate” domain of CUs and EE units is the home of the quantum wave function and nature’s creative source (Bohm, 1980; Friedman, 1997). It is this basic creative, undifferentiated, and ever-present field of latent activity that gives form, identity, and structure to the endless varieties of “matter” between the elementary matter particles and energy forces familiar to physicists and the anti-matter of physicists’ theories.

For example, the invisible, chargeless, short-lived Higgs boson particle —what Lederman (1993) called the “God Particle” in a book by the same name—would be one materialization of EE units as they approach the physical life plane and the proximate source of the Higgs particle’s power to endow formerly massless particles with their own mass by virtue of their interaction with its energy field. Quantum mechanics would be a special case of a much broader physical theory, in this respect, that has as its metaphysical starting point the general picture of a physical universe that is built up from the inside at each point where these fundamental units of consciousness and electromagnetic energy assert themselves to form physical reality. The physical universe is not its own source, in those terms.

By hypothesis, projections out of the body involve an intensification of EE unit activity and an alteration of the molecular structure of the projecting self as consciousness changes from a physical to non-physical form. The self provides its own vehicle and a means of transport which draws its energy and power to act from deep subconscious sources and the limited but definite generalized self-awareness and condensed knowledge of the atoms and molecules that compose the physical body. Modulating the neurological systems that underlie the bodymind information transduction process (Rossi, 1986), the self initiates an electrical and chemical response that transduces

the “aware-ized” energy of consciousness that underlies matter (i.e., mass-energy) from a physical camouflage form to a non-physical one. The self is the catalyzing agent, and consciousness is the “mental enzyme” that directs the transduction of energy into mass and mass into energy, which makes interdimensional travel possible. Consciousness, matter, and energy are one, in that respect (Faggin, 2021).

IMPLICATIONS AND APPLICATIONS FOR SCIENTIFIC EXPLORATION

What implications and applications might the scientific exploration of the interdimensionality hypothesis, out-of-body consciousness travel, and coordinate point activity have for informing other related issues, anomalies, or fields of study? First, scientists would be able to assess the probability that interdimensional coordinate points exist and whether out-of-body travel between planes is possible as a matter of scientific fact. The degree to which Roberts’ channeled theory of interdimensionality offers actionable hypotheses and verifiable predictions or is simply the product of an overworked imagination can be evaluated (Wahbeh et al., 2023).

Second, the proposition that out-of-body projections from waking and dream states offer a workable platform for scientific exploration of the basic universe and NHI communication, if confirmed, would be ground-breaking in astrophysics and astrobiology. When applied to psychology’s basic knowledge of who and what we are as a species, the implications are revolutionary and could bring about an entirely new science of psychology and consciousness (Weiler & Acunzo, 2025). A comprehensive analysis of how the empirically verifiable facts predicted by Roberts’ theory connect with related hypotheses concerning past visitations by beings from other systems, for example, would give additional plausibility to those myths and legends of aliens who tried in one way or another to advance the knowledge of the human species as implied by some archeological findings (e.g., the sudden development of agriculture, architecture, astronomy, law, transportation, and writing in Sumerian civilization; von Däniken, 2018). This would have important implications for evolutionary theory, opening the door to consideration of the possibility that the stock for the human species may not have entirely originated from this planet, that humanity’s ancestry is far more varied than supposed, and that evolution, as it is thought of, has had more than one beginning point.



Third, if sleep and dream states do indeed involve certain kinds of out-of-body projections in which the dreamer operates under the same conditions, more or less, that are native to a consciousness not focused in physical reality and encounters many of the same dimensions of existence that one will meet after the physical body is discarded at death, then the best way to become acquainted with conditions that may be encountered after death ahead of time, so to speak, would be to explore the nature of one's own dreaming self. Various forms of projections of consciousness (e.g., near-death experiences, shamanic-like journeying) have arguably proven helpful in acquainting the individual far better than words with the idea of life after death and diminishing the fear of death. Out-of-body consciousness travel to an alternate life plane, or reality-energy system, would likely have a similar effect (Monroe, 1994).

As a person gains greater familiarity with OBEs, learns to maintain stability and identity in the midst of a bewildering number of strange and previously unknown situations, and obtains knowledge of a vital kind of their own non-physical being while in a living state, the fear of death would predictively become attenuated and the idea of life after death less outlandish (i.e., altered state hypothesis; Garfield, 1975; Leslie, 1976). On the present theory, although it does not happen often because so many other issues are involved, it is quite possible to meet discarnate personalities during out-of-body projections. Monroe's (1994, Chapter 18) Lifeline Program of assisting deceased personalities to become aware of their after-death condition and transition to other forms of existence while in an out-of-body state is evocative in this regard and deserves further study.

In the final analysis, the scientist can know the reality and ontological validity of the out-of-body state in the only real way it can be known—personal experience. Experience is the one teacher. Until the phenomenon becomes known through the first-hand insights provided by self-experimentation, its existence remains only a belief. A history of personal self-experimentation with OBEs in whatever way one chooses (e.g., ganzfeld stimulation, dynamic concentration, progressive muscular relaxation, yoga breath and mantra, dream control, guided imagery, the Monroe techniques; see Rogo, 1983) would reveal a great deal about the true nature of the self. It would arguably provide the evidential data that individual scientists need in order to endorse the existence of this transformative capacity of the self. They would emotionally *know* from personal experience whether or not one's awareness can indeed operate separate from and independently of the body while in a

living state. Unless the structure of personality, or of the self, is clearly understood and emotionally experienced in this way, projection itself will not seem possible, and no further investigations aimed to satisfy the more specialized criteria of objective science will likely be undertaken. After all, why bother to investigate the reality of a fiction? As OBE adept Robert Monroe (1977) put it, "The ultimate proof of such affirmation is to experience oneself in this state of being" (p. 180).

Whatever the outcome of tests pertaining to the hypotheses and investigations proposed in this two-part essay regarding the nature of the interdimensional universe and the origin of UAP, the mechanics of travel between planes via coordinate points, and NHI communication in out-of-body states, a far-reaching rejection of the authenticity of UAP phenomena does not seem justified by science's actual knowledge at this time (Hernandez et al., 2018). As Jung (1959) put it, "*Something is seen, but one doesn't know what*" (p. 6). As with other problematic anomalies that currently escape conventional scientific explanations, alternative representations of the problem need to be explored. It may be that all that is needed is a willingness to re-examine the available evidence with what Buddhists call a "beginner's mind" and look for solutions to Fermi's Paradox from a broader interdisciplinary point of view. We may discover that the universe is not only more complex than we imagine, but more complex than we can imagine or believe possible, and that existence *out* of the body is, in greater terms, as natural a state as existence *in* the body.

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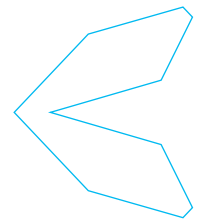
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ESSAY

Responsive Universe Hypothesis for Macro-PK: A Testable Framework Linking Meaning, Measurement, and Outcomes

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ABSTRACT

Psychokinesis (PK) is a class of psi phenomena in which mental intention is claimed to affect matter – both living and nonliving – sometimes at a distance. Reports of metal bending, healing, and other PK outcomes share a striking feature: the form of the outcome is congruent with the semantic content of the intention. For example, reports indicate that when the target material is metal, and “BEND” expresses the intentional thought, a physical process occurs in which the target piece of metal becomes soft and bends. But if the target is a diseased organ in a specific body and the intention expressed in the thought is “HEAL,” a vastly different physical process occurs. If such goal-specific patterns are genuine, they suggest an operative pathway that can be understood as a natural responsiveness to the meaning inherent in a specific need expressed in thought. This paper reviews representative evidence bearing on macro-PK claims, including metal bending, distant healing paradigms, and reports of object displacement. It proposes a Responsive Universe (RU) hypothesis as a testable system model. RU retains key insights associated with Lucadou’s Model of Pragmatic Information (MPI) while replacing MPI’s acausal, correlation-based account in which meaning is not a transmissible causal instruction, with an explicit causal pathway linking semantic goal specifications to measurable target outcomes. The mainstream scientific assumption holds that conscious thought emerges from matter once it reaches a threshold level of complex organization, and that thought is therefore a byproduct of matter – which is fundamental. The phenomenon of goal-directed PK, if robust, demonstrates that the opposite is also true: that the organization of matter can be a byproduct of thought.

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KEYWORDS

Synchronicity, psychokinesis, metal-bending, macro-PK, pragmatic information, semantics.

PART 1: THE PHENOMENON

Psychokinesis (“PK”) is the claimed ability to influence physical objects using the mind alone, without physical interaction. It includes alleged phenomena such as bending metal, moving objects, and biological healing, all

claimed to be the result of intentional conscious thought alone. Current Western science denies that PK exists. This denial exists in part because current Western science has no explanation for how thought can possibly affect the physical state of matter; therefore, PK cannot exist. The fact that there is no widely accepted explanation for a

phenomenon reported across cultures for centuries (e.g., see Gregory, 2002, for medieval accounts) is not sufficient grounds to deny its existence.

In the first part of this paper, I will review in detail facts which would seem to provide sufficient evidence to conclude that PK metal-bending is real. This form of PK has been widely demonstrated, witnessed, practiced, and studied. Besides metal-bending, other types of PK have been reported, including seed sprouting and moving objects as a result of mental intention.

In the second part, I discuss the conclusion that follows from the data: *when a strong desire or need underlies a thought, a specific physical process may, under some conditions, unfold in a way that implements the intention expressed in the thought.* Although there are different types of PK, for example metal bending, object motion, and remote healing, the underlying general principle upon which all PK appears to operate is *mind over matter* which, if true, must take its place as an important cornerstone of the operation of our reality.

The third part of this paper is devoted to the development of a model for situations in which PK metal bending and other psi-type phenomena may be studied. Drawing on insights reported by Houck and Hasted, as well as on structural components found in Lucadou's model of pragmatic information, the proposed model is based on the premise that PK operates within a hidden, cosmologically implemented information-processing framework.

Thought Can Make Metal Soft

The phenomenon of bending metal using the mind was introduced to the world by Uri Geller. Jack Houck, an aerospace engineer who managed a research group at McDonnell Douglas from 1970 to 1990 became interested in this form of "mind over matter" and originated the structured methodology of "PK Parties" where many participants were able to bend metal objects like spoons, forks, and metal rods at times with no force applied. Houck conducted controlled experiments at parties, some in collaboration with metallurgist Severin Dahlen. Although the concept of "parties" sounds unscientific, the rationale for attempting to generate metal bending phenomena within a group in which general excitement and heightened emotion occur is scientifically sound. Houck found that this environment, with from 15 to 40 people present, was most conducive to eliciting and sustaining the phenomenon.

He hosted 370 such parties, observing and documenting over 17,000 instances of the phenomenon, and found that

about 85% of all attendees had success in bending metal using PK. In these cases, the metal did something it never normally does at room temperature: part of it became temporarily "rubbery," like "putty" or "chewing gum," and easy to bend. By 2002, PK parties had been replicated over 100 times by other researchers with similar results (Houck, 2002; Houck, 2004b).

Houck summarized the general instructions he gave to participants as follows:

1. Make a mental connection with what you want to affect.
2. Command what you want to happen.
3. Release it (let it happen). (Houck, 1993, para. 13)

More specifically, his instructions were:

1. Hold the piece of silverware between the thumb and forefinger and rub gently.
2. Project a point of concentration in your head, almost to the point of pain
3. Then move this point of concentration down through your neck, shoulder, arm, hand, fingers, and project it into the silverware. In effect, this process allows the mind to achieve a link from the brain to some point within the silverware
4. Next, verbally command the silverware to bend. ... I have been having everyone shout as loud as they can: "BEND, BEND, BEND!!!" The people are asked not to just shout for the sake of shouting but to concentrate and intently command the silverware to bend
5. Then release that thought, sit back, relax, and use the body sensors (e.g., fingers or a feeling) to find the small time window when the silverware is ready to bend. Occasionally, push on the object with the other hand to see if the object gives. Most people have a hard time releasing the thought, and think that they have to continue to concentrate on the bending objective. I move around and try to break everyone's concentration. (Houck, 1993, para. 13)

"Because I have seen over 85 percent of the people learn to bend, I have tremendous confidence that this simple procedure works. That confidence also may have something to do with the success of the parties." (Houck, 1982, para. 11)

In his party events, Houck characterized three levels of metal bending ability – "kindergarten," "high school," and "graduate school" benders:

- **"Kindergarten" Bending** ... Each person starts with one forged-stainless steel fork or spoon. They hold



it in one hand. That makes the connection step easy because they know exactly where it is (in their hand). Then I have the whole group command their forks or spoons to bend by shouting “BEND, BEND, BEND!” The shouting is not really necessary, but it seems to get the group excited. The bending usually starts within seconds after I say “Release it”, meaning the thought. From that point on, it really does not take any concentration. In fact, the more distractions, the easier it is for people to “let go.” ... Even though the metal used in “kindergarten” could be bent by physical force, the people are trying to find the few seconds that the metal loses its structure (i.e., becomes rubber-like) during which time they can form the flatware into mangled shapes. They usually feel warmth coming out of the flatware when it is ready. ... Approximately 85% of the ...12,000 people [in a later article, written after hosting additional PK parties, 17,000 people; Houck, 2004b] at my PK Parties have experienced this level of PK. (Houck, 1993, para. 15)

- **“High School” Bending** After a person has bent up four or five pieces of flatware, then they are given a silver-plated spoon. Their task is to buckle the spoon bowl. I usually also have steel and aluminum rods available. ... This level is characterized by bending things that could not be bent using only physical force. ... About 18% of my PK Party attendees have achieved this level of PK. (Houck, 1993, para. 17)
- **“Graduate School”** For me, this is the most exciting part of the PK Party. I give two long tine forks (dinner forks) to each participant, and they hold one in each hand at the bottom of the handle. They are not allowed to touch each fork with the other hand. We command them to bend, and 11% of the people have experienced spontaneous fork bending. Sometimes a person has both forks bend or twist. These are not trained magicians. (Houck, 1993, para. 19)

He also offered an alternative form of PK at the parties:

- **“Seed Sprouting”** - Some people really do not like bending metal, so I let them sprout seeds. They command the seeds to “sprout”. Often a small sprout about 1/4” long appears within 5 to 10 minutes. (Houck, 1993, para. 18)

Regarding the necessity for “release,” John Hasted, a physicist who researched metal-bending in controlled experiments using strain gauge instrumentation, mentioned:

A most important lesson which is taught to the metal-bender by use of the strain gauge detector is the avoidance of over-concentration; he must learn ‘sudden inattention’ if he wants results. ... The strongest events often take place, it appears, when the subject relaxes directly after concentration. (Hasted, 1981, pp. 54-55)

Houck found that PK was more successful when more than one or a few people were present at a party – between 15 and 40 people yielded the best results (Houck, 1983), and he discussed the notion of a “field effect:”

Many experiments have been conducted within the PK parties. There does seem to be some type of field effect created within the area encompassed by the people at a PK party. In one experiment, we had sealed pop bottles with brass strips and other metals inside, with one bottle assigned to each individual. ... Similar bottles were placed in other homes. All of the rest of the bottles were placed in the center of the circle of people at the party. Even though none of the metal was bent at the end of the party, the bottles were left there for several days. The next morning, the brass strips were bowed and twisted. All of the brass strips at the PK Party location continued to bend for three days, and then stopped bending. Cutting the sheets of brass had apparently introduced stress into the resulting strips. The PK effect acted to relieve the stress, much like if the brass strips had been put in a furnace and allowed to “creep”. The control bottles at the other home did not have any bending in the brass strips throughout the same time period. (Houck, 1993, para. 24)

Another experiment ... was to take two packages of hacksaw blades, each containing two blades. The Rockwell hardness (Superficial 15N Scale) of each blade was initially measured. One blade was kept in a locked safe at my workplace and not exposed to PK. The other three hacksaw blades were taken to four PK Parties in a brown bag and placed in the center of the circle of people during each party. Only my metallurgist (Severin Dahlen) and I knew this experiment was being conducted. The blades exposed at the party were never placed near the control blade. All of the blades were tested for hardness prior to each PK Party over a three-month period. The hardness

of the three exposed blades all reduced to near that of annealed steel from the original very hard steel of the hacksaw blades. The control blade maintained its hardness throughout the experiment. (Houck, 1993, para. 25)

This experiment is fully detailed in Dahlen (1982).

Houck's Theory

In order to formulate a theory of the mechanism that operates in PK metal-bending, it is important to understand the nature of metal. Metal is composed of small, tightly packed crystalline regions called *crystallites* or *grains*, each with its own atomic orientation, separated by *grain boundaries*. Defects called *dislocations* are also present within the crystal lattice. These are essentially disruptions in the orderly arrangement of atoms along a line. These dislocations can move under stress, allowing the material to deform.

From his experiences, experiments, and scientific knowledge about the structure of metal, Houck developed a theory to explain the process that occurs during PK metal bending:

I concluded that the number of "dislocations" in the grain boundaries of the metal is a dominant parameter. The harder the steel, the more dislocations, the easier it is for people to PK that metal. Although we do not know how the mind can arrange to put "energy" into the metal, it does seem to use the dislocations as transducers. With no place to go, the energy turns into heat and melts the grain boundaries. With most of the grain boundaries molten for a few seconds, the metal loses its structure and can be easily formed (kindergarten and high school PK) or relieve internal stress (graduate school PK). (Houck, 1993, para. 26)

Figure 1 depicts Houck's concept of the metal-bending process. When a large enough concentration of grain boundaries, often in the zone targeted by the metal bender, melt together, the metal is hypothesized to "lose its structure" in that zone and become "rubbery." This change of phase event typically lasts from 5 to 30 seconds. Since the metal has thermal conductivity, the heat is conducted away after the peak of the state change event, and the metal "re-freezes." The area labeled STU (Space Time Unit) in the

figure is "a representation of the mind passing into another dimension where all information is stored, similar to Jung's collective unconscious and the metaphysics term 'akashic records.'" (Houck, 2004a) The idea of a dimension outside the physical domain of space and time where information is stored and processed has been discussed elsewhere (e.g., Graboi, 2024). The presence of the "STU" implies that metal bending somehow invokes the operation of a hidden system to implement the changes that take place in the metal to allow it to become soft and bend.

At the high school level, participants were given objects that could not be bent using muscular force alone. At the graduate school level, participants were not allowed to touch the metal area that bent. Figure 2 shows a graduate school bender holding two forks bent using PK (see also Barnes, 2003).

Discussion of Houck's Theory

Houck's theory of the mechanism that occurs in PK metal-bending depends in part on the fact that metals are essentially crystalline. In metaphysical traditions, crystals are often viewed as objects that interact with human psychic energy, consciousness, and intention. They are believed to receive, store, focus, amplify, and transmit forms of energy not yet recognized by conventional science. Practitioners claim that crystals can help "tune" a person's energy field (aura). Crystals are used in practices such as Reiki, claimed to channel universal life energy (*Rei-ki*), chakra balancing, and other energy healing practices. Today, crystalline silicon solar cells provide electricity for thousands of homes, and the chip industry builds virtually all its integrated circuits ("chips") on wafers made from crystals of silicon. (In the *Star Trek* fantasy, dilithium crystals regulate matter-antimatter reactions in the warp drive of Federation starships.) Hasted reported personally witnessing a single crystal of molybdenum about 1 cm in diameter being bent by PK through an angle of about 20 degrees (Hasted, 1981, p. 18).

Paraphrasing Houck's basic idea: *exotic energy*, unmeasurable with current instrumentation, which results from the information structure of *intentional thought*, enters into the crystal structure of metal. This energy interacts with *dislocations*, which are localized zones of stress and distortion in the metal crystal lattice. The stress concentrations of dislocations could act as energy accumulation points like micro-antennas embedded in the metal, as hypothesized by Houck. The more dislocations, the more receptors or entry points for this energy

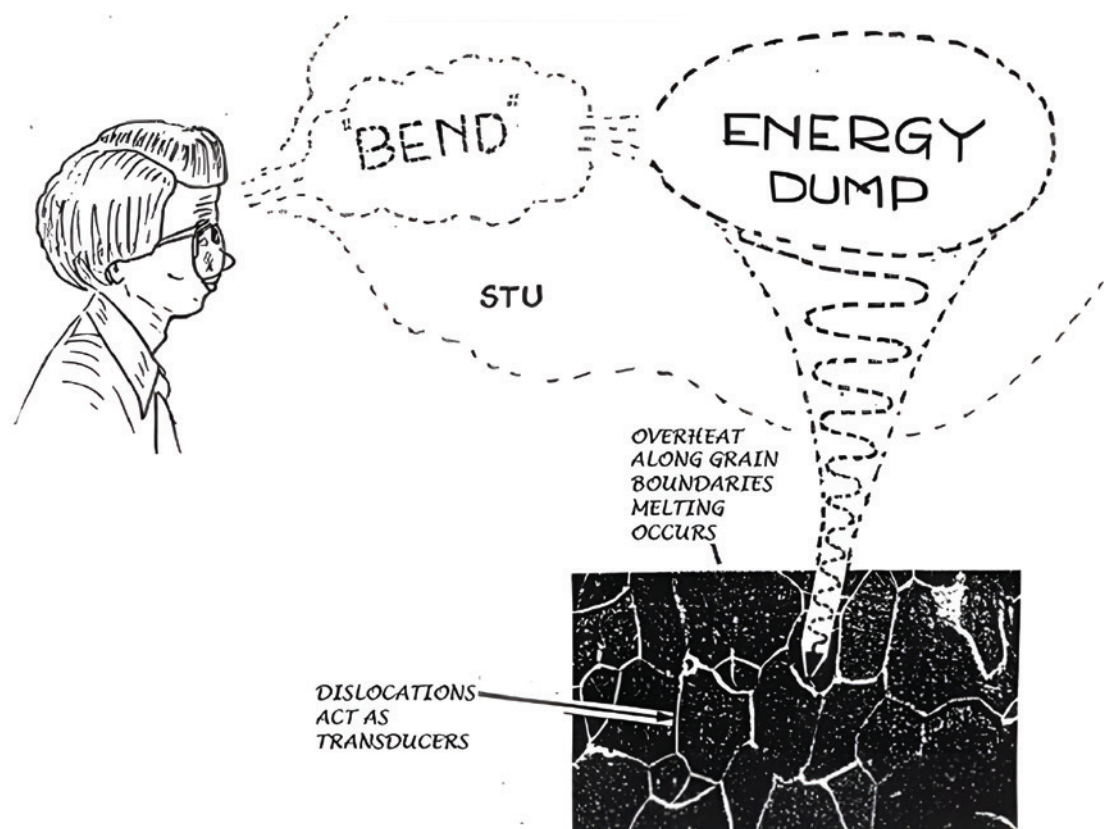


Figure 1. Houck's Concept of the Metal-Bending Process.

Note. The bottom image in the figure illustrates metal grain boundaries: adjacent grains (crystals) have different lattice orientations separated by irregular boundary regions where crystalline order is disrupted. In Houck's metal-bending accounts, the metal is described as entering a brief, localized "rubbery" interval (often reported lasting about 5–30 s) within a targeted zone. The mechanism by which an imperative intention (e.g., "BEND!") would couple to microstructural features such as grain boundaries is unknown. STU denotes "space-time unit" and is described by Houck as an information-handling process in another dimension. In this framing, PK metal bending is not presented as a simple "mind exerts force" model. Reprinted from *Researching Remote Viewing and Psychokinesis* (Fig. 6), by J. Houck, 1993, TREAT V Conference Proceedings (<http://jackhouck.com/rvpk.shtml>). Copyright 2004 by Jack Houck.

to interact with the metal, supporting Houck's finding that metal with more dislocations is easier to bend using PK. Dislocations store mechanical energy (strain energy). In Houck's model, they would act to trap, accumulate, redirect, and transform the incoming exotic energy into physical energy and heat. When the accumulated physical energy reaches a critical threshold, partial melting or softening at the grain boundaries would occur, resulting in a temporary loss of rigidity in the metal. Once the peak energy is released through bending or heat, there would be a natural drive to return to a lower energy state – the rigid solid.

There is no known type of physical radiation that, when directed into a metal, causes it to suddenly lose its structure and become rubbery at room temperature. When metal becomes molten at thousands of degrees, it could be described as "rubbery," but that is not what is happening

here. Many other models are possible, and it remains possible that a totally different mechanism might be in play. The key point is that in order for metal to become rubbery, a process must occur at the atomic scale or involve subatomic (quantum) interactions within the metal. And, by all appearances, it occurs as a result of an intentional *thought or need for a specific piece of metal to bend*. Houck's "Space Time Unit" (STU) acts as a hidden system between the thought and the creation of the energy that enters the metal. There is much research to be done before the exact nature of the physical process, as well as the nature of the thought process, is understood.

PK Bending of Plastic

Stainless steel as found in flatware and seeds are not the only materials that Houck found could be affected by PK.



Figure 2. Graduate School Bender Holding Two Forks Bent Using PK.

Note. A man who had both of the forks he was holding during Graduate School bend over spontaneously is shown [above]. He was holding the bottom of the stainless flatware fork handles, one in each hand. He was concentrating on the fork in his right hand when I noticed that the fork in his left hand was bending over spontaneously (not using the other hand). I asked him if he saw the one in his left hand and then he looked at it and said “How did that happen?” At that moment, the fork in his right hand bent over spontaneously. ... Any amount of fork movement is considered very special and occurs for approximately 11% of the people who participate in the Graduate School phase of PK Parties. Figure and caption reprinted from Material deformation by intention (Figure 2, lower-right panel, “Graduate School Bender”), by J. Houck, 2004 (<http://jackhouck.com/mdi.shtml>). Copyright 2004 by Jack Houck.

He mentioned, “children could easily bend plastic spoons and forks with PK.”

It was noticed that children were able to bend clear plastic forks and spoons. Normally, this material is very brittle and breaks when people try to bend it. The PKed area of the plastic looks cloudy to the naked eye. Under optical magnification, the cloudy area appears to have microcracks emanating from a small bubble. It looks as if the spot of the bubble was heated, causing that area to expand, creating the microcracks. This effect seems to have some correlation to the heat being created along the grain boundaries in metal. The nice part about using clear plastic is that another feedback is provided to the person doing the PK in that they can observe the cloudiness as a signal for when the plastic is ready to bend. (Houck, 2004a, para. 24)

Figure 3 shows photographs of plastic spoons bent by children using PK.

Object Motion

Over the course of his parties, Houck witnessed other effects of PK besides metal-bending, plastic-bending, and seed sprouting. He mentioned the ability to move objects using PK:

One time, I saw that the small girl ... had bent a large steel rod. I went over to where she and her mother were sitting and patted her on her head, telling her how great I thought she had done. Her mother then said, “Oh, she can do more than that.” I asked, “Like what?” The little girl turned and pointed to the tennis stick figure with a counterweight for balance on the mantle above the fireplace and said: “Move.” The figure then spun around on the point of the stand it was on. (Houck, 2004a, para. 18)

Recently, Dullin and Jamet (2018, 2020) and Dullin et al. (2024) have shown that it is possible to rotate plastic domes with PK (see, for example, <https://www.youtube.com/watch?v=L39Cbzavy38>). Dullin et al. (2024) further found evidence consistent with a learning curve: for one subject it was possible with practice to increase the weight of a plastic dome rotated by PK from approximately 10 grams increasing with practice to 400 grams in one year. McClenon (2024) has also reported evidence that online groups of individuals can influence the rotation of pinwheels.

Healing

Houck also witnessed instances of spontaneous healing at his PK parties:

I have noticed a number of events that would be considered spontaneous healing. For example, in the middle of a PK Party, a man would stand up and say that his back had just been healed. The PK “energy” seems to be magnified at PK Parties and is strongest at the center of the circle of benders. This seems to correlate well with the “chi energy” discussed in various martial arts disciplines. (Houck, 2004a, para. 29)

The phenomenon of healing or otherwise affecting the biology of living organisms using thought has been

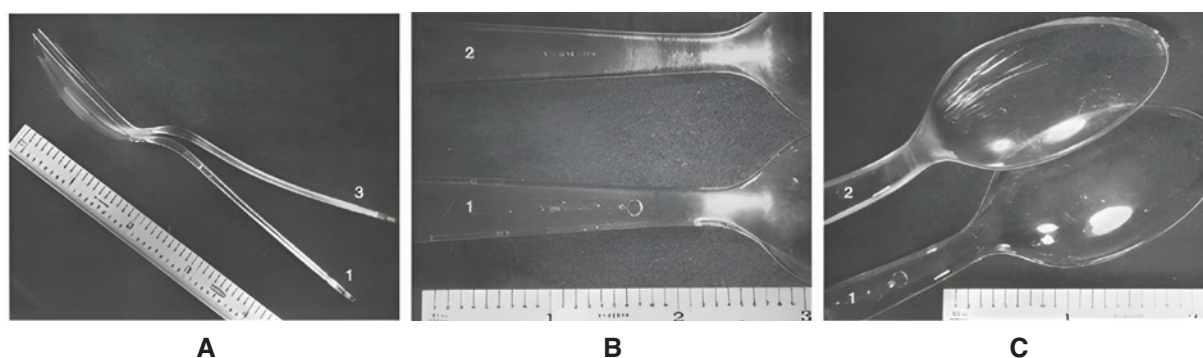


Figure 3. Photographs of Plastic Spoons Bent by Children Using PK.

Note. Panel A: Curvature of the handle of Spoon No. 3 compared to Spoon No. 1. Panel B: Transverse crazing in the handle of Spoon No. 3 compared to Spoon No. 1 (convex sides up). Panel C: Longitudinal crazing in the bowl of Spoon No. 3 compared to Spoon No. 1 (convex sides up). Adapted from Examination of deformed and fractured plastic and metal objects (Figs. 4–6), by J. Houck, 1981, McDonnell Douglas Astronautics Company (<http://jackhouck.com/psd.shtml>).

demonstrated and is an active area of research (see, for example, Achterberg et al., 2005; McCoy, 2011; Radin et al., 2015; Rebman et al., 1995).

Houck concluded:

The implication that if a magician can perform a trick bending a spoon, that everyone bending spoons is being fraudulent is ridiculous. I have given many PK Parties, and I have seen many incredible PK events, and I am totally convinced of the reality of the ability of the human mind to affect things. (Houck, 1993, para. 43)

For additional examples, see <https://www.exometaverse.org/spoon-bending>.

Takeaways

At spoon bending parties, which have been hosted by hundreds, likely thousands of people over the last 40 years, there appears to be much evidence to support the idea that, *as a result of intentional thought, accompanied by emotion*, metal can temporarily “lose its structure” and become “rubbery,” during which time the metal can bend of its own weight or with relatively gentle shaking or nudging. John Kruth, Executive Director, Rhine Research Center, Durham, NC, currently hosts spoon bending parties and noted that “at every event it seemed that the metal was getting softer and more malleable” (J. Kruth, personal communication, 2025). John Hasted, Ph.D., Professor of Experimental Physics; Head, Department of Physics, University of London, specialized in atomic physics and solid-state physics, authored well-regarded technical books, and trained as a scientist. He conducted experiments and observed subjects that produced results without touching the metal

directly. His book, *The Metal-Benders* (Hasted, 1981) documented his observations and experiments. These involved repeatable protocols and instrumenting the metal with strain gauges to measure effects quantitatively. Referring to a “floppy condition” in metal, he mentioned personally witnessing metal in this state.

Given the evidence available today – widely replicated, and witnessed by thousands, photographed, measured with strain gauges, and videotaped, of which a small fraction has been discussed here – taken together, the data appear sufficient to justify serious hypothesis formation around the possibility that, under certain conditions, metal temporarily exhibits anomalous softening in association with intentional thought.

A skeptical reading may argue that PK metal bending never occurs and instead suggest more conventional explanations, such as mechanical leverage, pre-bending, metal fatigue, stress concentration, heat transfer, perceptual artifacts (camera angle/illusion), chemical treatment, conjuring methods, selective reporting, demand characteristics, or social contagion. To support a stronger evidential claim, tests should employ robust controls, including pre-registered bend criteria (e.g., specified angle and/or torque thresholds), standardized and blind-coded metal samples with documented mechanical properties (e.g., hardness and metallurgical characterization), secure chain-of-custody with tamper-evident packaging, continuous multi-angle video, force/torque measurement (e.g., grip sensors or load cells), thermal monitoring (e.g., thermocouples and/or infrared imaging), and blinded outcome scoring. Controls should include matched handling without (or with redirected) intention instructions, along with other controls to assess expectancy and experimenter effects.

PART 2: THE IMPLICATIONS

Instead of focusing on the specific physical process involved in one particular type of PK, it is valuable to consider the general process that operates across different PK situations. Generalizing, the specific physical process that occurs in each type of PK depends on the *semantics* of the particular associated imperative, e.g., “Bend!” vs. “Sprout!” vs. “Move!” vs. “Heal!”, and the target material being affected. The *semantic content of the thought imperative* appears to be a major factor that governs the form of the resulting physical process. It seems amazing that the *meaning* inherent in an *idea* expressed in conscious (and possibly unconscious) thought is a central factor in PK processes. Table 1 contains a list of some of the ideas, or “imperatives,” used in PK and the specific physical effect that each one produces.

Imperatives do not need to be composed of single words. Below describes how Harold McCoy, healer, dowser, and clairvoyant who successfully located a stolen harp over 2000 miles away after receiving a request over the telephone from a person he had never met (Mayer, 2007), used PK to keep ticks and chiggers out of his garden. He called this type of PK a “thought form:”

I got into a meditative state. ... When I was visualizing, I saw a bubble come out of my solar plexus – just energy, a “thought form.” It got larger and larger, and then I was inside it. I was in the geometric center of this bubble. It looked like a “dome” because half of it was underneath the ground, so it could take care of other things. So, in my mind’s eye, I could see this bubble getting bigger and bigger, so that it went out to the edge of my yard and my garden. I was programming the following to happen: I was saying, “Ticks and chiggers will be very uncomfortable in the center of this bubble, and they’ll all want to get out of it. Those that are out will not come into it, because it is filled with energy that is detrimental to ticks and chiggers.” I was visualizing this bubble and these thought forms. You can program things to do what you want. I programmed this bubble so that ticks and chiggers would be uncomfortable in it and move out of the yard. In a few days I realized I had no more ticks or chiggers on me. (McCoy, 2011, p.37)

A thought form is essentially the creation of a thought based on a need which can be associated with a specific

location in space and time and which persists. The semantics of a thought form can apparently influence the behavior of living organisms as seen in McCoy’s example. McCoy wasn’t just wishing vaguely; he was describing a very specific “program” that seemed to keep working in a particular place over time. The actions of thought forms do not sound like coincidences, but rather like the environment responding to the semantic content of intention.

In each case mentioned in Table 1, a *different specific physical process* appears to be implemented in order to achieve the intended result. It is as if the imperative comes first and the universe, using what has the appearance of masterful intelligence, takes the semantics of the imperative as a specification to guide the construction of a temporary physical mechanism to implement the result implicit in the meaning of the imperative expressed in the thought. For example, whatever physical mechanism causes an object to move, or a particular body organ to heal, or a seed to sprout, or ticks and chiggers to move out of a garden, must be quite different from the physical mechanism that causes metal to bend. And each physical mechanism appears to have impressive structure and complexity.

The statement that the universe designs and implements a complex process is a description in human terms of what the universe appears to do. It must be clarified that the highly intelligent behavior does not automatically imply the presence of mind, consciousness, or a divine being operating outside or above nature. High intelligence and highly appropriate goal-oriented system behavior can be produced by purely deterministic means, as modern artificial intelligence demonstrates. This point will be developed further later in the discussion.

The Connection Between Thought and the Way the Universe Works

The idea that the universe “designs and implements” a physical process to manifest a thought imperative implies that there must be a close – an intimate – connection between *thought* and the *way the universe works*. What kind of universe is it that can work in this way? More broadly, what does the reality of PK imply about the fundamental characteristics of *thought*, *emotion*, *release of thought*, and the *fundamental operation of the universe*? One implication is that the universe is *responsive to need*. “Intention” may not be the best choice of a term that describes the driving factor in PK. An “intention” may be whimsical - one can intend something out of duty or logic – whereas a need implies a more consequential state of disequilibrium that



Table 1. Example Imperatives Used in Macro-PK and the Resulting Specific Physical Effect.

IMPERATIVE	EFFECT		
"BEND!"	Bends a piece of metal, often in the hands of the person issuing the imperative.		
"SPROUT!"	Causes a seed to sprout, often in the hands of the person issuing the imperative.		
"HEAL!"	Heals a biological disease or physical biological issue in a target individual.		
"MOVE!"	Causes objects of various materials to move unidirectionally in space and time.		
"SPIN!"	Causes objects of various materials (e.g., plastic, metal, wood) to spin.		
Multi-word Imperative Example <table border="1"> <tr> <td>TICKS AND CHIGGERS WILL BE UNCOMFORTABLE IN A SPECIFIC SPACE</td><td>Causes ticks and chiggers to leave a garden (see text)</td></tr> </table>		TICKS AND CHIGGERS WILL BE UNCOMFORTABLE IN A SPECIFIC SPACE	Causes ticks and chiggers to leave a garden (see text)
TICKS AND CHIGGERS WILL BE UNCOMFORTABLE IN A SPECIFIC SPACE	Causes ticks and chiggers to leave a garden (see text)		

Note. Depending on the type of PK involved, as specified by the semantics of the imperative used, different physical processes must occur to achieve the desired result. Depending on the target object or effect of the PK, the actual physical process that occurs appears to be able to influence matter at its deepest physical levels – molecular, atomic, or sub-atomic (quantum).

seeks resolution. Needs are often affectively charged (by urgency or personal significance) and may operate partly outside focal awareness, whereas intentions are typically explicit, articulated, and consciously framed. In this sense, “need” better captures the combination of motivational depth, emotional strength, and goal relevance that many anecdotal accounts treat as the conditions under which anomalistic outcomes are most likely to occur.

A Responsive Universe

The phenomenon of PK, if it exists, implies that a “responsive universe” is a fundamental working principle in our reality. Other psi phenomena indicate that this basic PK principle can affect neurological processes in an individual. As an example, consider an incident reported by Patrick Casement, who, against his will, found himself

thumbing down a particular car passing by him on the road:

My grandmother lived about four miles from the little church my parents usually attended. I was to go to the service there on Easter Day. Afterward, I decided to walk the four miles back rather than wait forty minutes for the bus because I wanted to test out my solution to a familiar school mathematics question. I had worked out exactly how fast I would have to walk so the bus wouldn't catch me up. If my calculations were wrong, I would admit defeat by taking the bus for the rest of the journey. I was absolutely determined to walk those four miles at just the right pace, to prove that I'd worked it all out correctly.

However, after about twenty minutes, I was shocked to find that – in what I can only call a reflex action, as though my right arm had suddenly taken on a life of its own – I put out my right hand to thumb down one particular car. I was utterly astonished to watch myself defeating my own purpose. To my relief, the car drove past – my race against the bus was, I thought, not to be spoilt. But a moment later, the car suddenly stopped. Since, regrettably, I had thumbed it down, I felt I had to accept the offered lift.

I got into the front beside the chauffeur. I imagined he had first driven by and chosen to ignore me, but had then been told to stop by the lady in back. So I turned to her, and simply said, "Thank you."

She immediately asked, "Were you at Winchester?" I had no idea what prompted the question, but I replied that I was currently at that school.

She replied, "If you are there now, you won't know the person I am thinking of. He was called Roddie Casement and he went to Winchester, but that must have been a long time ago now." When I told her that she was actually speaking of my father, the lady was delighted, and

immediately asked, "Is his mother still alive?" I informed her that she was, and that we would soon be driving past her door, two miles down the road we were on. The lady then told me a story almost exactly parallel to the one I had been hearing from my grandmother all week. This lady had been trying to trace her close friend – my grandmother – ever since they had lost touch during the war. She was, in fact, the friend my grandmother had been seeking for ten years. They spent that day together – probably their last chance, as my grandmother died soon thereafter. (Mayer, 2007, pp. 21-22)

The car contained a woman who had a need to see Patrick's grandmother, who also had a need to contact the woman in the car, with whom she had lost touch. In this case, the chain of events can be interpreted, within the RU framework, as if a responsive process had coordinated circumstances in a way that reconciled the needs of two people.

Note that Patrick said, "in what I can only call a reflex action, as though my right arm had suddenly taken on a life of its own." Given this description, it is possible that the deep-level physical process the universe implemented included directly stimulating the efferent nerves that caused Patrick's right arm, hand, and fingers to move into a hitchhiker position, bypassing his neurological executive control (decision) function. He simply watched in astonishment. Alternatively, Patrick's "deeper unconscious self" may have received information to signal a hitchhike at a higher level than individual neuromuscular commands, leading to unconsciously moving his body in the appropriate way. Either way, what Patrick considered to be his "free will" was not applicable. Other incidents of this type of behavior are found in the literature (e.g., see Mayer, 2007).

The principle of "intelligent need fulfillment" by the action of a "responsive universe" can also be termed, "synchronicity." Synchronicity has been discussed as a potential driving factor in the way the universe works by Carl Jung and others who speculated that it reflects a deeper layer of reality in which events are linked by *meaning* rather than cause and effect (Jung, 1960/1952; Lucadou et al., 2007). Jung defined synchronicity as "a *meaningful coincidence* of two or more events, where something other than the probability of chance is involved (emphasis in original, Jung, 1952/1960, p. 655)."

For the remainder of this discussion, this type of general behavior will be termed the "*Responsive Universe Hypothesis*" (RU).



PART 3: MODELING PK-TYPE PHENOMENA

Lucadou (1995; see also Lucadou et al., 2007) proposed the *Model of Pragmatic Information* (MPI) as a framework for understanding a range of reported psi-type and synchronistic phenomena. MPI draws on the formalism of Generalized Quantum Theory articulated by Atmanspacher et al. (2002). An important component of MPI concerns how PK-type anomalies and other psi phenomena might be modeled. In line with Generalized Quantum Theory, MPI treats such effects as *acausal*, *entanglement-like correlations* that can arise within a coupled participant–target–measurement system.

Entanglement phenomena observed in quantum physics are often described as “acausal” in the sense that measurements performed on spatially separated parts of an entangled system show correlated outcomes without any detectable signal appearing to pass between them through space-time. For example, when one particle changes its spin state, the other also changes its spin state. These correlations can persist even when the particles are separated by enormous distances. The observed correlations occur at theoretical speeds greater than thirty thousand times the speed of light (Santamaria Amato et al., 2023).

However, entanglement is fragile, since interaction with the environment or measurement typically destroys the entangled state. For this reason, entanglement cannot be used as a means for transmitting controllable information. The *acausal non-transmission-oriented correlation* mechanism in the MPI framework is termed the *NT (Non-Transmission) axiom*: no meaningful communication occurs between the elements involved in a psi anomaly. This framing of psi phenomena in terms of *acausal*, *entanglement-like correlations* can help explain why reported psi anomalies often appear difficult to stabilize, highly sensitive to context, and resistant to conversion into a reliable signaling method.

In the MPI model, “pragmatic information,” refers to information that can affect the state, interpretation, or action of a system – in other words, what information in a given situation can actually make a difference. This differs from the conventional Shannon information as used in communication theory, which quantifies uncertainty reduction in a message independent of meaning, or information calculated simply from symbol count. Pragmatic information includes only information that is capable of having an effect on a system.

Pragmatic information in MPI depends on two factors: *novelty*, meaning the degree to which an input departs

from what is already expected, and *confirmation*, meaning the degree to which the resulting pattern can be recognized or interpreted in light of the observer’s existing schemas and constraints. For example, a page of text written in an unknown language may be highly novel, but if it cannot be recognized or interpreted, its confirmation is low, and therefore its pragmatic information is also low.

A “system” in the MPI framework refers to an organizationally closed, coupled arrangement comprising the participant, the target, the observation or measurement process, and the context in which the outcome matters.

MPI treats five elements as mutually interactive in a psi occurrence: *context* (the situational framing); the *participant* (the intention-bearing agent); the *target* (what is purportedly influenced); the *measurement process* (the means by which outcomes are recorded); and *meaning* (how participants and observers interpret outcomes relative to goals and significance). Because outcomes can feed back into attention, expectation, interpretation, and procedural choices, the system is characterized as *self-referential* rather than as a fixed, observation-independent mechanism.

The concept of pragmatic information together with other aspects of the MPI formalism can be incorporated within the RU framework as a principled way to quantify the factors that support or suppress an effect. Figure 4 illustrates such a framework in a configuration intended to capture metal bending as reported in PK party settings.

The RU Model

Figure 4 illustrates a model of the PK metal bending process based on the RU hypothesis. The RU model retains many aspects of MPI’s core emphases – including pragmatic information, context sensitivity, within-system coupling, feedback dynamics, and measurement constraints. And it illustrates the key aspects of RU, including an operational communications channel between the PK agent’s thoughts and a hidden “design and implementation” element that translates the semantic imperative in the thought into a physical process which includes a physical interface actuator which can affect the atomic structure of metal.

In the Figure 4 diagram, several time-varying variables are associated with pragmatic information, $I(t)$. These variables are *context* $C(t)$ (with the subfactors *framing*, *stakes*, *protocol*, *expectations*, *social setting*, and *beliefs*), *need* $N(t)$, *intention* $W(t)$, *release*, $R(t)$, and (post-observation) *confirmation* $B(t)$, and *novelty/surprise* $E(t)$. These are treated as internal state variables in the participant, which may

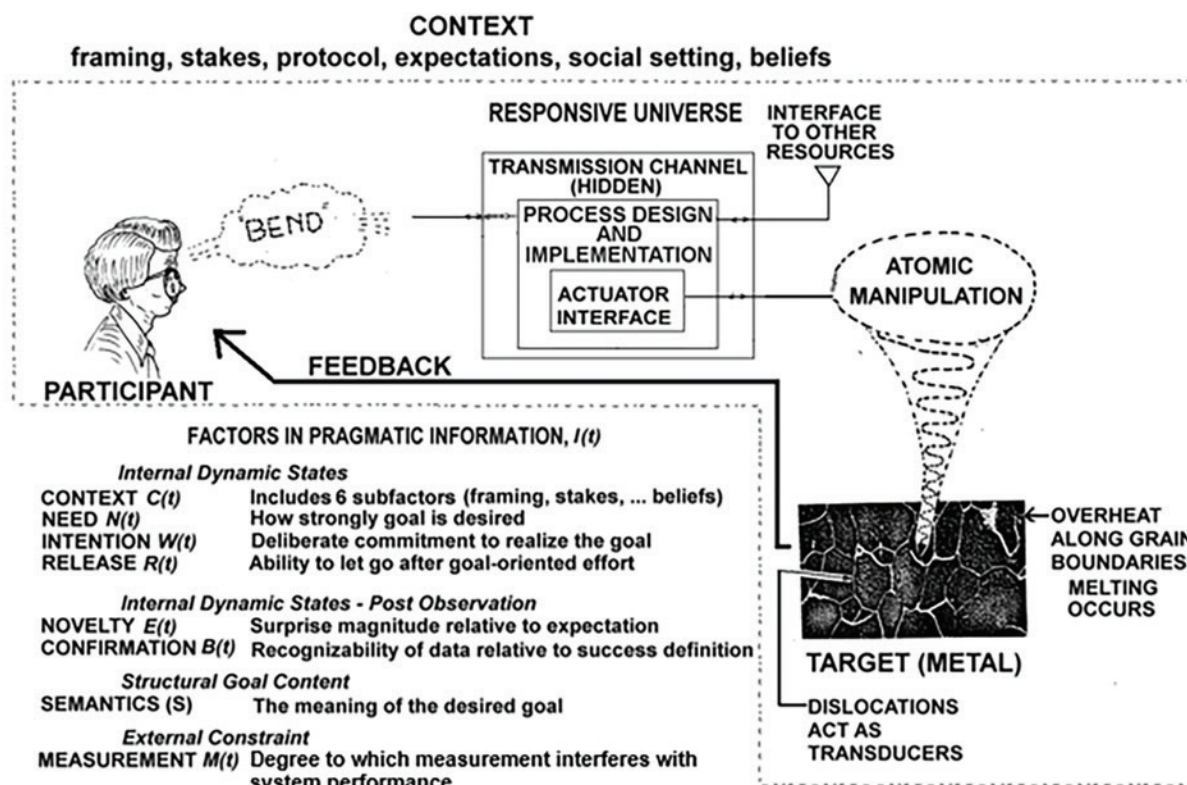


Figure 4. Process Model of PK Metal Bending in an RU Framework.

Note. This figure depicts an organizationally closed coupled system in which multiple “BEND” attempts may occur within the framework of the Responsive Universe (RU) hypothesis. See text for discussion. Adapted from *Researching Remote Viewing and Psychokinesis* (Fig. 6), by J. Houck, 1993, TREAT V Conference Proceedings (<http://jackhouck.com/rvpk.shtml>). Copyright 2004 by Jack Houck.

fluctuate with feedback, learning, self-monitoring, and changes in attention or motivation.

Semantics refers to the *meaning/content* of what is being attempted (e.g., “bend the metal in my hand,” or “spin the pinwheel I am looking at”), often stable across a session rather than as a continuously changing variable in the participant’s mind. The semantics act as a *goal descriptor*.

Another important factor in the PK metal bending situation, as emphasized by Houck and also Hasted and Robertson (1979), is the *ability to “let go”* after focusing on achieving a result. This suggests that the variable, *release* (R), should be recognized as a significant factor.

Measurement is an external constraint parameter that describes the strength and character of the coupling between the measurement process and the system, including factors such as resolution, coverage, intrusiveness, and audibility. In the MPI framework, “measurement constraints” reflect the idea that measurement tends to disrupt an entanglement-like system; thus, in PK, the more precise or complete the measurement, the more likely the

MPI framework would predict it would interfere with the occurrence of the event. Lucadou (1995, 2024) suggested a practical compromise for improving the likelihood of capturing video footage of anomalous events: reduce the resolution or interpretive completeness of the observation method, for example, by defocusing the video camera. In the RU framework, “measurement constraints” are not reflective of measurement effects in the context of entanglement, but typically refer to features of the environment that can make the PK agent uncomfortable or inhibited, thereby degrading performance.

Comparison of MPI and RU

The NT (Non-Transmission) axiom, according to which no meaningful communication occurs between the elements involved in a psi anomaly, marks one critical difference between the MPI formalism and the RU hypothesis. The other critical difference is that MPI is essentially an acausal framework whereas RU is essentially a causal framework. Within MPI, each independent occurrence

of a PK event of a given type is understood as a case of meaningful correlation that is not mediated by ordinary signal transfer or a causal mechanism in the usual sense; it is viewed as a form of synchronicity. By contrast, the RU framework implies that each PK event involves the operation of a hidden information-processing system that interprets the semantic content of the participant's intentional thought and then, given sufficient need, designs (if necessary) and implements a physical process capable of realizing that specific thought imperative. In RU, there is therefore a causal, meaning-bearing pathway between the thought imperative and its physical realization.

Because MPI treats each psi anomaly as a fragile context-bound acausal and infrequent correlation event rather than as the output of a stable causal mechanism, the production of diverse goal-specific PK effects on demand by the same person across time and settings would be difficult to account for within the MPI framework. Yet the parapsychological and biographical literature contains a number of prominent case claims and practitioner reports describing relatively stable and reliable performance by particular individuals, including Ingo Swann, Stefan Ossowiecki, Harold McCoy, Nina Kulagina, and Ariel Farias (see Barrington et al., 2005; Gimeno & Burgo, 2017; Keil and Fahler, 1976; McCoy, 2011; Swann, 2017; Wehrstein, 2021).

If PK outcomes can be proven to be reliable or even semi-reliable, then an RU model that includes an explicit communication channel and implementation layer offers a more explicit explanatory framework for how goal-related semantic content could, in principle, be mapped onto repeatable physical outcomes.

Time-synchronized, highly repeatable PK events show up in distant intentionality studies using randomized "send/no-send" blocks and objective neurophysiological measures (fMRI/EEG). These studies report reliable condition-linked differences under sensory isolation and find that such occurrences occur across many repetitions in randomized time-specified blocks (Achterberg et al., 2005; Richards et al., 2005). Likewise, in DMILS/remote-intention paradigms and meta-analyses (Schmidt et al., 2004), effects (when present) are estimated across dozens of trials per study and large numbers of sessions overall – emphasizing semi-reliable repetition rather than isolated anomalies.

PK events described within the RU hypothesis must be represented in a template appropriate to the situation at hand. This variability arises because what counts as the organizationally closed, coupled system depends on the type of psi claim involved and on where interpretation, feedback, and agency actually reside. In some cases,

such as PK-party metal bending, the target is inert metal. In other paradigms, such as sender-receiver telepathy or Ganzfeld, both participants function as active subsystems, each with expectations, interpretive schemas, and feedback processes capable of updating attention and strategy. In still other synchronicity-type narratives, such as the "unwilling hitchhiker" case mentioned above, the relevant coupled system appears to span three agents together with the social and physical circumstances that enable the outcome. In that case, it's not just "something odd happened." Rather, a *chain of coordinated content-specific events* occurred: the desire to walk home that day; the hitchhike reflex; the car stopping; "Where you at Winchester?"

If that "system" is broadly defined (Patrick + woman + grandmother + timing + location), implementation and goal satisfaction in this case extend across a considerable span of space and time. What occurred would be difficult to interpret as merely a set of acausal coincidences. These examples therefore point to the need for RU to be expressed within a *flexible system specification*. For each paradigm, one must explicitly define the agents included, the feedback pathways, the agent or agents performing the observation or scoring, and which contextual variables (e.g., experimenter expectancy, audience belief/affect, protocol constraints) affect confirmation and novelty. These choices determine what constitutes the "pragmatic information" in a given case.

Where MPI explains psi-like events as acausal correlations, RU instead hypothesizes a hidden goal-responsive information-processing component (HGRIP for short) that formulates an effective coupling and constraint pathway between the participant's semantically framed need and intention and the target. In this view, the semantics of the need and intention functions as a *goal specification* that the HGRIP transforms into an operational plan which is then executed via an *actuator interface* that implements the appropriate activity in the target. In this framework, RU contains an explicit implementation pathway by which complex, directional macro effects could, in principle, be semi-reliable and repeatable.

The cases RU aims to explain typically involve (1) goal specificity - not merely "something odd happened," but *this prespecified outcome happened*; (2) complex targets - e.g., a body or seed is not a single-bit system; (3) persistence or semi-reliability - the phenomenon resembles a usable capacity rather than a one-off coincidence; and (4) cross-context performance - similar effects appear across settings, times, and observers. These are the features that acausal, non-transmission-oriented models tend to treat as fragile, unstable, or effectively disallowed, because they

begin to resemble the operation of a message-like channel rather than a purely correlation-based anomaly.

Reports of semantically specified, goal-directed macro anomalies (e.g., bend / rotate / move / heal / sprout) appear in both documented case reports and, in growing amounts, controlled experimental paradigms. If PK effects are assessed to be real and dependable under certain circumstances, models in which meaning of a desired effect is causally inert become increasingly strained, and a “responsive universe” hypothesis – in which such meaning functions as an organizing constraint on outcomes – becomes comparatively more plausible.

The plausibility of RU therefore rests on whether blinded designs, in which targets, scoring rules, and analyses are specified before data collection, can demonstrate semantic specificity, repeatability, and possibly a learning curve at levels difficult to reconcile with an acausal, non-transmission model. If so, then the question shifts from whether PK and other psi events are essentially acausal correlations to whether they are glimpses of a lawful responsiveness, that is, a dimension of reality in which meaning is not merely a passive description of events but a constraint that drives the selection of the events that occur.

CONCLUSION

Witness statements and uncontrolled demonstrations cannot, by themselves, establish proven causal claims or substitute for preregistered, blinded experiments. The foregoing discussion has reviewed witness reports of macro-PK events from credible sources and cited controlled experiments from peer-reviewed journals to create a convergent, hypothesis-generating body of material. This has allowed clarification of relevant and common features reported across PK contexts and other psi phenomena (e.g., goal specificity, apparent “need” conditions, and the structure of observed effects). Case reports, rare events, and historical observations are routinely used in mature sciences to guide theory construction and experimental design when replication is difficult – particularly for sporadic phenomena.

The types of PK discussed in this paper can be interpreted in terms of outcomes that appear to be driven by need-shaped intention and semantically specified aims. Broadly, this perspective resembles *intelligent need fulfillment by a responsive universe*. In his book *The Intelligent Universe*, Fred Hoyle (1983), astronomer and mathematical physicist, suggested that the universe is structured in such a way that intelligence is a built-in feature. This “cosmic

intelligence” is implied in the laws of physics and is viewed as capable of shaping matter and life toward complexity, possibly as a type of self-organizing principle. The RU hypothesis is consistent with a weaker, empirically testable claim: that meaning and motivation may, under constrained conditions in PK, function as variables that help organize which material outcomes occur.

Considering Houck’s and Hasted’s research and their insights into metal-bending and accepting – as a working hypothesis – that a key driving factor in PK-type events can be framed in terms of the *semantics of the desired result*, we are led to consider the possibility that we are embedded in a reality that is not merely indifferent to meaning, but sometimes (or always) organized by it. If even a subset of PK events can be confirmed under stringent, blinded conditions with adequate controls and prespecified analyses, they challenge a central metaphysical assumption of the modern worldview: that thought and its meaning have no causal standing in nature.

In the RU framework, *need* reflects the amount of motivation in a situation – urgency, stakes, and significance – under which it may become operationally effective. Intention, desire, will, importance, and emotion are not treated as decorative inner states, but as components of a goal-structure that, if RU is correct, can be reflected in physical outcomes through lawful constraints not yet captured by currently accepted models.

RU is testable because it commits to an explicit causal sequence linking semantic goal content to a hidden implementation pathway and, ultimately, to measurable change in the target. RU therefore generates preregisterable predictions that can fail. A particularly strong test is semantic specificity under blinding. Because RU claims that the *meaning* of the goal specified by a particular person’s thought helps determine the form of the outcome, one can preregister tasks in which the semantic target is randomly assigned and temporarily concealed from scorers and experimenter, and then test whether the outcomes exhibit goal-congruent structure. Other preregistration considerations would include, in the metal-bending paradigm, an objective bend criterion (e.g., “success = bend angle change > 1 degree”) and utensils matched with respect to measured torque-to-bend and delivered via a secure chain of custody.

Participants could be prepared and qualified by going through the progression used by Houck at a PK party, and participants at the graduate school level could be assigned instructions such as “bend the fork in your hand.” Higher resolution might be tested: “bend fork A” versus “bend fork

B" or possibly "bend left tine" versus "bend right tine," with objective, instrumented scoring. Evidence of reliable, blinded semantic congruence would support RU's central claim; a consistent absence of semantic mapping, even when anomalies are otherwise detected, would count against it.

Learning may improve the effectiveness of the RU implementation pathway, analogous to a controller that refines performance through feedback. Early on, effects (if present) may be limited to coarse realizations (e.g., "bend somewhere"), whereas practice could bring about improved attentional stability, emotional engagement, and ability to "release," enabling finer instructed distinctions (e.g., "bend the left tine"). Alternatively, learning may increase the frequency or magnitude of effects without improving semantic specificity, suggesting an effective ceiling on fine-grained goal controllability, possibly due to limited resolution or bandwidth in the hypothesized transmission channel.

From a simplistic perspective, RU could be described as an anthropomorphic concept of a responsive cosmos acting with intention. Yet history shows that such interpretations are often adopted at one stage of understanding and later abandoned or reinterpreted. In ancient times, for example, the cosmos was widely imagined as populated by many gods, each acting within a particular domain to bring about specific events in nature and human life. Other examples include theological models in which divine will was invoked to explain the detailed workings of the natural world. In many such cases, what first appeared to require personal intention later came to be understood in terms of impersonal law, structure, or mechanism.

The highly intelligent behavior attributed to HGRIP does not, by itself, imply a mind, consciousness, or a divine being operating outside or above nature. High intelligence and highly appropriate goal-oriented system behavior can be produced by purely deterministic, algorithmic, and mechanical systems, as modern artificial intelligence demonstrates. Such operational systems could, in principle, be self-organizing and arise from relatively simple initial conditions, just as immense complexity in the universe appears to have emerged from the highly uniform and much less complex conditions thought to have existed at its origin.

Therefore the appearance of intelligence, purposiveness, or goal-directedness in a system does not by itself require us to conclude that the system is conscious, anthropomorphic, or divine. It may instead reflect the operation of a deeper lawful process capable of producing highly organized and adaptive outcomes without personal intention.

The effects of PK may be conceived not as the action of a supernatural mind, but as the expression of a deeper optimizing process that can, under certain conditions, generate goal-congruent physical outcomes. What appears to be intention may instead reflect the systematic tendency of a complex process to move toward states that satisfy constraints, reduce tensions, or optimize in other specific ways. In the case of PK, this possibility can be interpreted in terms of a cosmos acting mechanically toward *optimization*. The governing principle is simple: when need is successfully met at any relevant level of organization, a more optimal state is achieved. Here, "need" is defined as a state of tension, deficiency, imbalance, or unrealized requirement within a system, such that its fulfillment would increase coherence, stability, adaptation, or functional fit at the relevant level of organization.

This line of thinking offers a more explanatory account of how PK effects might be manifested, instead of understanding them as "correlations" that tend to "happen" through a largely opaque "entanglement-like mechanism" that prohibits meaningful communication.

If PK effects are manifested through an automatic optimizing process, this opens up a Pandora's box of very deep questions. It would suggest that the semantic content of thought is, in some way, accessible to the cosmos and that, when need reaches sufficient strength, an automatic cosmological process may be engaged that tends toward the realization of that need. In such a view, the process would appear capable of operating across multiple levels of physical reality, including atomic, spatial, and biological domains. It could therefore, in principle, account for reports of thought alone leading to metal becoming temporarily pliable, pinwheels spinning with apparently no force acting on them, bone fractures healing in response to thought, and people being brought into significant contact. The implication would be that this process is not local or occasional, but pervasive and continuously available wherever the relevant conditions are satisfied.

Such a level of operability is far removed from the assumptions of current Western science. But if PK is eventually established as a genuine empirical fact, a fundamental reorganization of our understanding of thought and its relation to the cosmos will become unavoidable. If phenomena of this kind are validated, they will require a major revision in how we understand mind, matter, and their cosmological interface.

Today's dominant view of conscious thought within the current scientific paradigm is one of "emergent materialism." Its premise is that consciousness and the thought that

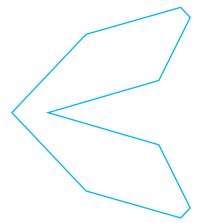
accompanies it emerge from the arrangement of matter when it exceeds a threshold of sufficient complexity. In this perspective, all aspects of thought spring from physical processes that occur in matter, which is fundamental. The phenomenon of PK provides compelling evidence that, at least in certain circumstances, it is *thought* that plays a primary causally organizing role, and the physical processes that govern the organization of matter can arise from specific needs expressed in thought. Relevant concepts include *will, desire, importance, emotion, and release*. In this view, so called “anomalous events” are not in a class of curiosities at the edge of science; they become clues that our metaphysics has been too small - treating conscious thought as a spectator when it may be part of the machinery. If the universe can function as if it is responsive to the semantics associated with needs expressed in thought (e.g., “Bend!” vs. “Sprout!” vs. “Move!” vs. “Heal!”) and can act to bring specific individuals together in win-win scenarios – without such action being traceable to pure coincidence – this implies a universe that works on principles quite different than purely physical mechanisms and inherently meaningless recombinations of matter.

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**BOOK AND
MULTIMEDIA
REVIEW**

Consciousness Science Goes Mainstream: Review of “The Secret of Secrets,” “The Telepathy Tapes,” and “Beyond the Brain”

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Three creative works take different approaches to exploring human phenomena through the lens of scientific research and direct experience. Collectively, Dan Brown’s “The Secret of Secrets” novel, Ky Dickens’ “The Telepathy Tapes” podcast, and Bial Foundation’s “Beyond the Brain” documentary series signal the normalization of conversation around consciousness in the mainstream. While the creators behind these media works are curious enough and open enough to undertake the subject, all three deliberately give space to doubters’ concerns about measuring psi and about the integrity of evidence for non-local consciousness. “I don’t know” is an oft-uttered statement across the works, suggesting that the *what* and *how* of the as-yet-unexplainable are not mutually exclusive. It is possible to acknowledge and measure that something is happening that seems outside of classical physics and other disciplines, even if the process is not understood. The novel’s protagonist is a skeptical academic involved with a noetic scientist; the podcast’s host is an open-minded journalist; and the made-for-TV docuseries is based on a book by a medical doctor who is the former CEO of a century-old, family-owned pharmaceutical company. Worldwide exposure of the blockbuster book and podcast – both of which reached No. 1 in their categories – and the Portuguese-language documentary, supplemented with an interview series with featured experts in English, have advanced the post-materialist perspective with sincerity, balance and discipline. Near-Death Experiences, Out-of-Body Experiences, Extra-Sensory Perception, spiritual awakenings, psychic and mediumistic abilities, and many more esoteric phenomena officially reside in the public domain now. As awareness, testimony, and research of them expand, it prompts questions: Is it accurate to continue to refer to these experiences as “anomalous”? Will scientists and scholars feel emboldened by the public’s green-lighting these topics? Does this triumvirate signal a tipping point for legitimizing noetic science beyond its own ranks?

CONSCIOUSNESS SCIENCE GOES MAINSTREAM: REVIEW OF “THE SECRET OF SECRETS,” “THE TELEPATHY TAPES,” AND “BEYOND THE BRAIN”

The oldest question – of who we are and what it means to be human – is new again, catalyzed by recent major creative works that take different paths to convey consciousness science to the public. A novelist, a journalist, and a corps of researchers examine our beyond-physical aspects in a shared quest for understanding.



While their methods to investigate the matter and convey findings in context for comprehension and meaning vary widely, in the case of Dan Brown's novel, Ky Dicken's podcast, and Bial Foundation's documentary series, they tell the same story: The body of evidence for non-local consciousness is compelling and undeniable. While it is possible to qualify and quantify some aspects of the physical experience, the mechanism of phenomena remains elusive. The search for truth continues.

In each production, the reader, the listener, and viewers are brought into the lab to witness phenomena and attempts to measure what is happening, and to make sense of it. Along the way toward entertaining, informing, and enlightening their audiences, the storytellers have sparked, mobilized, and galvanized interest, discussion, and imagination on topics surrounding human perceptions and capabilities.

Do these media presentations do right by the evidence, and by the public?

At worst, they risk sensationalizing the topic, diluting the credibility of scientists and their work, and misleading the masses.

At best, they stand to normalize the conversation, demonstrate the integrity of the researchers and the evidence, and educate humans on our innate magic.



"The Secret of Secrets" novel

Author Dan Brown

ISBN: 0385546890

The book opens with a neuroscientist experiencing an incredulous Out-of-Body Experience that she prays will become a *Near-Death Experience* – not an *actual* death. She vacillates between a terrifying, painful ordeal and the tranquility of non-physical existence. In an instant, the author has brought the reader into this liminal space, where this woman of science toggles between the two worlds she studies from her own lab. This scene – and the pattern of the novel – is set in a juxtaposition: The merging of objective science in the physical world versus the subjective experience of the ethereal. In this scene, the scientist becomes the experienter through an "anomalous experience." Such duality is woven throughout the story, which makes it relatable to cynics, skeptics, and post-materialists alike through characters, circumstances, and facts.

This bold beginning gives way, over the next 600+ pages and a caper involving governments racing to harness human consciousness for their own ends, to the reader learning of the chasm among scientists on consciousness theory; that one's existence does not end at physical death, it simply transmutes; and, "As consciousness becomes untethered, our powers of perception grow" (Brown, 2025, p. 625). The latter statement refers to inhibitory neurotransmitter gamma-aminobutyric acid (GABA), which, the author writes (pp. 342-344), restricts supernatural perceptive abilities to aid focus in the three-dimensional world. GABA lessens with altered states of consciousness (meditation, anomalous experiences, death, et cetera). This assertion has been challenged by critics; perhaps, it is just Brown's inference or a hypothesis. The reader doesn't know because there are no attributions offered throughout the book, though he reportedly spent eight years studying the science of his topic (Weingarten, 2025), and mentions The Institute of Noetic Science [for "the important and illuminating work you do" (Brown, 2025, p. 674)], The Global Consciousness Project, and The Center of Consciousness Science in the *Acknowledgments*.

"We already know from near-death experiences that death involves a breaking free from our physical form...combined with an intense feeling of joy and connection to all things. If we know our individual consciousness comes from outside our brain – as so much noetic research now shows – then to my ear, it sounds like consciousness simply abandons the physical realm at the moment of death...and reintegrates back into the whole. You no longer need your body to *receive* the signal...you *are* the signal," Brown writes halfway into the book (p. 348).

This is significant for two reasons: It's the post-materialism stance in a nutshell, and the word "noetic" appearing in an international best-seller is a triumph for mass education and visibility. This type of exposure cannot be bought. "Psi" appears, too, as do telepathy, precognition, mediumship, shared dreams, Akashic field, Stargate, fractals, The Egyptian Book of the Dead, and sudden savant syndrome. Brown isn't playing safe. He doesn't need to.

That Brown decided to make post-materialist science and philosophy the centerpiece of a work is remarkable for two reasons: (1) As an author with 250 million books in print across 56 languages, he is influential at many levels; and (2) his stories, tethered in exhaustive research, compel the reader to reconsider conditioned beliefs. Brown strips down the corrupt and powerful, from governments to religion, to remind us we are naturally equal and divine.

No matter where one resides on the continuum of consciousness theory – from man-as-machine to non-locality, Brown manages to appeal to all. "We can't yet *prove* this cosmic realm exists, but it seems to be regularly glimpsed by minds in altered states. Unfortunately, these experiences are fleeting, uncontrolled, subjective, and often non-repeatable – making them suspect scientifically... We have no quantifiable method, machine, or technology capable of receiving signals from the cosmic realm," Brown writes (p. 487). "Only the *brain* can do that."

All such claims were preceded by a lone statement on a page before Chapter 1: "All artwork, artifacts, symbols, and documents in this novel are real. All experiments, technologies, and scientific results are true to life. All organizations in this novel exist."

Theoretical physicist Brian Green challenged Brown's take on non-local consciousness during an interview for the World Science Festival in 2025. Brown says, "I feel like we're at that moment in human history where the science that you're doing is starting to say, *Wait a minute. This notion of local consciousness actually doesn't work, and we need a new model sort of like ... Copernicus said, Wait a minute. That star should be there. We've got too many anomalies. Let's try the sun at the center, and all of a sudden everything worked. I feel like we're at that moment with human consciousness, and that's why I decided to study it*" (World Science Festival).

Is the reader meant to *trust* that all the claims are verifiable? Or is the reader meant to simply contemplate non-local consciousness? Maybe Brown's recipe of facts and folly is just the right flavor to pull the reader into a liminal space.

Brown is a master of stoking fascination in the natural, the contrived, and the corrupt. Conspiracy theories, his critics say. His body of work has focused on bringing the hidden to light, exposing secret and powerful constructs, and walking the edges of unquestioned beliefs. Just as "Angels & Demons" showed fallibility within the Vatican, "The Da Vinci Code" redefined The Holy Grail, and "The Lost Symbol" taught the divinity within, "The Secret of Secrets" has the public – and, hopefully, the mainstream scientific research community – engaged in the conversation about humans' natural perceptive abilities, non-physical phenomenon, and non-local consciousness.



"The Telepathy Tapes" podcast
Host Ky Dickens

Ky Dickens is a self-described "science nerd" and is an award-winning filmmaker and podcaster. It shows. Her explosively popular "Telepathy Tapes" podcast started simply: When she heard neuroscientist Dr. Diane Hennacy-Powell on a podcast talking about how non-verbal autistic children exhibit telepathy, she had to know more. She soon met neuropsychiatrist Dr. Hennacy-Powell to witness the phenomenon first-hand and follow the story on how science could make sense of this. Dickens uses her documentary production skills to excellent effect, bringing a listener into the scene, whether that is driving around in a rented van talking to her resident-skeptic cameraman, or sitting in a living room while nonverbal autistic college student Akhil Lad sees through his mother Manisha's

eyes in a series of seemingly impossible and miraculous experiments.

"The kids like Akhil should be accepted, and instead of trying to fix them, see what their capabilities are, what their skills are and work on strengths," Manisha Lad says in Episode 2 (Lad, 2024b, Sept. 16). "Everybody is busy, either trying to understand them, research them, make judgments about them and trying to get them to come in our world and do things what we do...There has to be an agreement and mutual understanding ... What is this phenomena happening? Why are his mind and my mind completely connected?"

The show marries the scientific pursuit with the first-hand experience of young nonverbal autistic youngsters through the work of Hennacy-Powell. "The idea that non-speakers might have abilities with their minds that the rest of us have either forgotten how to use or just simply can't access," as Dickens puts it (Dickens, 2024a, 2024b). The audience learns alongside Dickens, who anchors her wide-eyed fascination with the pursuit of understanding and fair treatment for the children and their families.

"Non-speakers have been judged by their behaviors for decades. Schools, doctors, society-at-large, make judgments on what their body is doing, but this isn't an accurate reflection of their intelligence. It's a beguiling trap," Dickens says in the same episode. "It's hard for scientists to get research funded in this realm, because ... much of our scientific paradigm is materialism which, more or less, says the only things that can be real are things that can be observed and measured. So scientists who earnestly want to research and look into ESP and telepathy have historically not been given much respect and, certainly, not money. And Dr. Diane Hennacy Powell has been trying, but there needs to be a ton of research looking into this."

Manisha Lad says, "Whoever is asking for data, Akhil is the data." (Lad, 2024b, Sept. 16)

Like Brown in "The Secret of Secrets," Dickens has a cynical character: Michael, the cinematographer. After filming dozens of experiments in telepathy, Michael asks Dickens, "Do I have to believe in God now?" (Ognisanti, 2024). He goes on, in a great representation of what a curious-but-skeptical member of the mainstream public could be pondering: "I was, like, trying to find an explanation for these things happening. I'm seeing it with my own eyes and it's, like, *Okay, does this open up the possibility that there is something bigger than us happening, whether it's like some spiritual thing or something metaphysical?* When you see it, that's an easy road to go down."

Dickens' questions become the audience's questions. "I'm wondering about the origins of consciousness, and if it's limited at all by time or space or even death. And I'm wondering how widespread this phenomenon could be," she says (Pickens, 2024).

Telepathy and autism have converged as a lead-in to talking about consciousness, and Dickens has run with it to great success. After deep-diving on the central topic, the content expanded to animal telepathy, coma, the mind-body connection, healing, and more. Within five months of launching, "The Telepathy Tapes" landed the No. 1 podcast spot, and a year after that it hit 12 million downloads. This side gig became her focus, and she started running ads to support herself and a team. The documentary film is expected to be released this year (Stephan, 2025).

The fact that Dickens was an outsider to anomalous experiences and consciousness research was a benefit. Her curiosity about two off-center and misunderstood topics (telepathy and autism) spoke to a niche audience (the families and teachers of nonverbal autistic children). By asking questions and allowing the story to be told through first-hand experience and science, the listener is entranced. This podcast serves as a model for those who want to convey scientific findings to the public.

Telepathy is often accompanied by mediumship, as it is in Akhil Lad's case. However, *seeing people* is the phrase used in the podcast, not "mediumship"; that word joins "The Telepathy Tapes" vocabulary in a future episode. There may be multiple millions of people who were unfamiliar with the concept and the lexicon of psi who now are familiar with it and actively engaged in conversation about it. That's the power of a well-told story.

Medical doctors Anita Moorjani and Eben Alexander are among the medical and scientific experts sharing their tales of transformation via NDE in Season 2 ("Tape Talks"). Engineer and inventor of the microprocessor Federico Faggin shares in Episode 24 how he was catapulted from a materialistic worldview to a post-materialist one overnight through a spontaneous spiritual awakening. He also relates a story of witnessing exceptional mediumship and telepathy from those with cerebral palsy. There was a time when people with high academic credentials would not share personal details and certainly would not venture into the ethereal. Yet "The Telepathy Tapes" is just one place these stories are regularly being shared – by the highly degreed experiencers willing to talk.

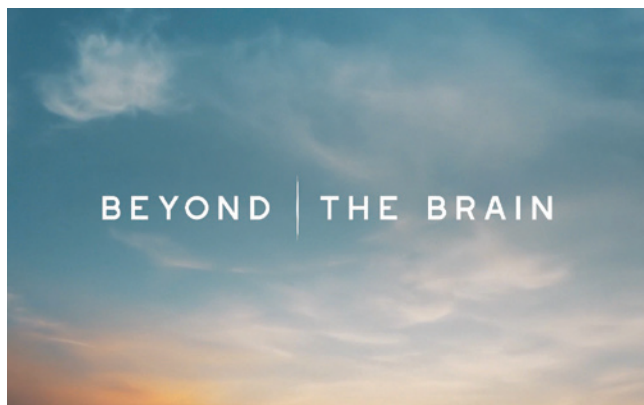
With an established following, Dickens has welcomed a *Who's Who* of psi and consciousness researchers to the

show, from biologist Rupert Sheldrake, “The Science of Magic” author and IONS Chief Scientist Dean Radin, to energy healing scientist Shamini Jain, and nuclear physicist Tom Campbell, among many others.

As Hennacy-Powell states in the very first episode about her work with nonverbal autistic children’s telepathy: “I knew that a lot of people would think, *Boy, Diane’s gone off the deep end*, but that’s the risk any scientist takes when they challenge the current paradigm. The data was so compelling and accurate that I had to follow it, even though I knew I was risking my scientific reputation” (Hennacy-Powell, 2024).

By the end of that episode, questions around consciousness have emerged: “Does it mean consciousness is coming to us from somewhere else and we’re both tapping into the same signal, or what?” says Manisha Lad (Lad, 2024a, Sept. 9). These are the words of a mother trying to learn about her son’s abilities. More than 12 million people – so far – have heard her story and her question.

The conversations held between a filmmaker, a scientist, and a mother went viral and scaled to the point that a large worldwide audience has learned about the state of consciousness science on non-locality.



“Beyond the Brain” documentary series RTP & Bial Foundation

Television programming is a crowded and high-stakes business. Ratings matter because advertising matters. It’s tough to sell a show concept for anything outside the mainstream. Science is not considered mainstream entertainment, and topics of hauntings, ghosts, mediumship, Near-Death Experiences, and other phenomena usually are relegated to channels and shows that are off-beat, sensationalist, and/or use a cringeworthy backing track of “spooky” sounds. That’s why Portuguese public television network RTP’s broadcast of the “Beyond the Brain”

docuseries is remarkable. Securing the mainstream media broadcast was the first triumph, and the high production quality, integrity with which the content was treated, and balanced storytelling on the science of the mind together make a masterpiece of a production.

The 16-part series is a collaboration between RTP and Bial Foundation that showcases the questions, the scientific investigations, and the findings into the non-physical nature of the human experience. In addition to the 30-minute episodes, co-hosted by journalist Mário Augusto and Bial Foundation Chair Luís Portela in Portuguese (yet featuring several English-speaking experts), teasers of each episode appear in English along with one-on-one interviews with each researcher and expert featured in the series on the foundation’s YouTube channel.

The series, which aired from May to September 2025, achieved an average TV audience share of 4.1% and reached about 153,000 viewers. It generated about 40 news pieces in Portugal, which their communications office deems “significant public and journalistic awareness.” The show is attributed with sparking record attendance at the Bial Foundation’s “Behind and Beyond the Brain” symposium, themed “End-of-life experiences,” following the series broadcast. “This response suggests a growing engagement not only among specialists but also within the wider public, with scientifically grounded explorations of these topics.”

The collaborators are now seeking broadcast partners outside of Portugal, which is bound to include English subtitles or voiceovers. Among the English-language videos on YouTube, the most-viewed episode teasers are “Near-Death Experiences” (57,000 views), followed by “Quantum Physics” (29,000 views), “Experiences in Mediumship” (25,000 views), and “Evolutionary Trajectory” (23,000 views). The others hover around 11,000 views as of late April. All of those are in Portuguese; the English-language versions do not seem to have been promoted, as most are in the hundreds of views. There’s an opportunity waiting there.

Could there also be a conflict of interest waiting in the wings?

After all, Bial Foundation is one of the foremost investors in research “focused on the healthy human being, in its physical and spiritual dimensions, particularly on topics still largely unexplored but susceptible to profound and rigorous scientific analysis.” The Portugal-based group has supported nearly 1,000 projects involving 1,900 researchers from 31 countries since 1994, and the articles published in journals have garnered about 65,000 citations. It is some body of work, and it’s growing: The 2026/2027

call for grant applications prioritized psychophysiology and parapsychology. This series features many of those experts. According to one scientist featured, “Everyone loves Bial and Luís,” and the series is considered a “great resource” that is “very well produced and inclusive.”

That a commitment and funding of such frontier science should come from a family-owned pharmaceutical company (which joined with the Council of Rectors of Portuguese Universities to form the foundation) appears paradoxical for a field of study that seems so much about understanding natural phenomena. Most pharmaceutical concerns owe their financial success to recreating nature’s balms in a chemistry lab. Yet the Bial Foundation – and certainly the researchers to whom it awards grants – are earnestly in search of answers on the *what* and *how* of the human experience.

The production is a collaboration between a public station and a not-for-profit foundation, both dedicated to the common good, so the joint venture is clean. In fact, great care seems to have been taken in representing the research.

The level of humility, curiosity and transparency exhibited by the 52 researchers interviewed in this series was high and consistent. Remarkable, too, is that despite their sophistication in science, they can communicate the meaning of findings in a relatable way to the public. This cohort’s hyper-awareness of the pressure from the scientism crowd seems “baked in” to their discourse, often framing their hypotheses and findings to what that crowd accepts. They are meticulous and careful. “I don’t know” is an answer offered often by researchers throughout the series.

Yet that does not preclude disagreement.

In the mediumship episode, viewers are taken into the lab with investigator Chris Roe of the University of Northampton and medium Shelley Youell of Arthur Findlay College, which is owned and operated by the Spiritualist National Union. Neither Roe, Youell, nor the technician operating the EEG machine know anything about the deceased person. A standard set of questions is asked by Roe, and Youell provides the answers based on what she’s sensing. Her eyes remain shut in the black, soundproofed room, as she shares answers.

The medium goes on to explain the “mind-to-mind communication ... through what we call extra-sensory perception, which is your five senses.” She says, “I believe that the very core of all this is the sentience, the feeling and the emotion because you really can be moved. Even though you get pictures,” Youell explains, later revealing

what she considers the point of this work. “Some people can’t cope with their loss, whereas it changes peoples’ lives when they can communicate and feel the presence of their loved one themselves. They can bring much, much healing.”

Roe and Youell are countered by Chris French, director of the Anomalistic Psychology Research Unit at Goldsmiths, University of London. While his title would seem to be sympathetic to mediumship research, his stance is otherwise. “If you’d asked me about this a few years ago, I wouldn’t have put mediumship as very high on the list of *Well, there may be something in it, after all*. But it’s risen up my rankings because of this recent research. So I will watch that area of research with interest.” What’s needed, he says, is independent replication of results from a variety of labs around the world.

While each episode delves into one aspect of the mysteries of the unseen – even treating ghostly experiences with respect – the big-picture message always surfaces.

Leanna Standish, ND, PhD, who is a senior research scientist at Bastyr University’s School of Naturopathic Medicine in Kenmore, Wash., states it simply in the series trailer: “If we could demonstrate that we actually are really interconnected, I think it would change everything.”

MISSING CITATIONS

An opportunity missed by all three works was a reference guide with citations for the science presented. The novel contained no footnotes or *Appendix* pointing to published papers; nor do the podcast’s show notes share scientific sources beyond the transcript of the conversation; nor does the docuseries offer an online companion guide of citations. This is understandable because the content was aimed at the general public. However, in each case (and each episode), a web page citing the evidence base for claims would go a long way toward transparency, credibility, and persuasion among cynics and skeptics. Instead, both advocates and critics of the science presented in the book and the podcast have been discussed and challenged, respectively, online. Such references can – and ought to be – produced retroactively.

Besides acting as back-up for the stories told through these media works, the reference pages will train AI and search engines on the language, resources, and topics to strengthen their abilities to surface those scientific papers during LLM queries or on Google.com. It is essential to remember our audiences are no longer reserved to humans

in the online milieu. This type of “online hygiene” increases access to scientific content.

Where citations were lacking, names were plentiful, if the reader, listener, and viewer are willing to Google them for more information.

SAVVY STORYTELLERS MAKE SCIENCE ACCESSIBLE

All three works were produced for an audience of lay people who understand plain language. It's likely many have experienced an as-yet-unexplained phenomenon or know someone who has. The high production quality, well-crafted stories, relatable anecdotes, research findings, and the academic and experiential pedigree of the experts convey seriousness. Perhaps most important is that they all lead from “I don't know” and bring a spirit of curious skepticism to a topic.

The characters (real and contrived) featured in all three works share common traits: They frame their conversations in skepticism with facts and calm, and they know how to convey the science in a relatable way. The first skill helps neutralize detractors, and the second one helps invite understanding.

That they are consistently adept at communicating speaks to scientism's entrenchment in society. These *bona fide* scientists and experts – and even the book characters – are so used to swimming upstream at their universities, labs, and institutes throughout the research cycle, from proposing projects and securing funding, to conducting the work with rigor and vigor, and getting published in peer-reviewed journals. Several of them are empathetic to the materialism stance they admit they once professed.

More crucially for a public audience, they meet the readers, listeners and viewers on their level. The technique is not a dumbing-down of the content; it's by acknowledging that phenomena happen and sharing their own wonder about the *what*, *how* and *why* of testimony by experiencers. Their questions are surprisingly ordinary, which makes them accessible to regular thinkers and feelers.

Both are vital skills, and the novel, podcast and documentary series feature both to great effect.

CONCLUSION

Consider “The Secret of Secrets,” “The Telepathy Tapes” and “Beyond the Brain” an *arpeggio*: The novel's drama in Prague across a 24-hour timeline is the high note; the podcast is the down-to-earth, relatable center note; and the

docuseries is the serious scientific ground note. Each is a distinct tone able to stand on its own, yet when struck together, they cast a major harmonic resonance.

So, too, are their messages:

Science is catching up with human experience.

We are more than blood, bones, and brain.

The brain is a receiver.

When the brain dies, something continues.

The mainstream popularity of these creative works is a phenomenon. These creative works normalized the conversation of the science and experience of psi, and the public response green-lighted the topic.

Could the mainstream visibility and consumption of these works indicate scientism's heyday has peaked? Could it mean the public gives equal weight to both objective and subjective evidence? Could it mean the paradigm shift toward post-materialism is being powered by the people?

It may be time for the research corps to accept that there is widespread demand for science to demystify the more anomalous experiences of consciousness in the quest to better understand ourselves. Perhaps professional, balanced media projects that enjoy major public engagement will provide enough credibility and visibility to jolt conservative funding sources and academic publishers to relax their prejudice and boundaries enough to learn about the methodologies and integrity that are abundant in this field. The opportunity for interdisciplinary collaboration is ripe.

Imagine a time when noetic science is regarded equally with the classic sciences. How does that feel?

Get used to that feeling. The degree to which “The Secret of Secrets,” “The Telepathy Tapes,” and “Beyond the Brain” revealed and normalized the science of psi is significant – and that conversation has momentum.

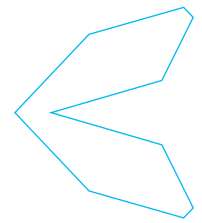
It's not just about the pursuit of truth about *what* and *who* we are. It's about *why* it matters.

The end of “The Secret of Secrets” makes it plain: “I believe our views on death are about to change. Top scientists around the world are increasingly convinced that reality is not *at all* as we believe. This includes the provocative idea that death is, quite possibly, an illusion ... that our consciousness *survives* physical death and lives on. If this is true, and if we can prove it, then within several generations, the human mind will function under an entirely different premise – the belief that death is not so terrifying after all ... Just think about that. The *one* universal fear that drives so much of humankind's destructive behavior ... would evaporate. If we can hold on long enough to

arrive at that paradigm shift without blowing ourselves up or destroying our planet, then our species may well turn a philosophical corner that ushers in an unimaginably peaceful future" (Brown, 2025).

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**BOOK AND
MULTIMEDIA
REVIEW**

Capturing Bigfoot – A Documentary Film Review and Analysis Director Marq Evans

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Capturing Bigfoot
Director Marq Evans

A new feature length documentary has been released, titled “Capturing Bigfoot,” and it is causing considerable discussion on the validity, or lack of same, of the famous 1967 Bigfoot film, called the Patterson-Gimlin Film (or PGF for short). This new documentary purports to present evidence that the famous film was hoaxed, and people who advocate for a hoax are in a hysterical sense of euphoria, thinking this finally and conclusively proves the PGF was hoaxed. It does not.

The fundamental flaw of this documentary is that it presents “evidence” in a form that has a compelling impact on the average mind in the court of public opinion, but the “evidence” fails completely to meet the criteria that a legal, scientific, or academic process and determination would require. So in truth, it proves nothing other than that we currently live in a society that relishes theories and conspiracy claims but has precious little appreciation for real truths or rigorously proven facts.

As a fair disclosure, I am associated with this documentary, in the sense that I am an expert on the analysis of the PGF and thus was interviewed on camera at length and was shown and allowed to inspect the new evidence they present, and some of my interview and appraisal is included in the film final edit. But I have not seen the final edit and can’t comment on what elements of my interview were used or the context in which they were presented. What I can do is fairly appraise the new film evidence I was shown, as well as address a second major controversy that the documentary presents.

The impact this new documentary is having on the near 60-year debate as to the validity, or lack of, of the PGF, is profound, and has given a metaphorical heart transplant to people who advocate for the PGF being a hoax. And they are relishing their perceived “victory” of proving the PGF was hoaxed. The only thing standing in the way of their victory is good science and the rules of evidence. As both a researcher and reviewer, I stand beside good science and follow good evidence wherever it leads. In our current society’s receptive posture toward “alternate facts,” that is a lonely place to stand.

The two new elements of this documentary causing the most discussion and hysterical celebration are a new segment of film footage that strongly resembles the PGF, and apparent confessions by two family members of Roger Patterson, the man who filmed the bigfoot creature in 1967. Taking them one at a time, I begin with the new footage, which I have viewed and physically inspected, in April, 2025, while the producers and director questioned me and filmed me doing the inspection.

This new footage shows a remarkably similar sequence of a human in a fur costume walking through the woods, and the overall staging and performance by the person in the costume has similarities to the creature in the PGF that are sufficiently similar as to

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confidently discount mere coincidence. Somehow, the two pieces of footage, the PGF and this new footage, are connected. The question is how?

Two explanations for the similarity are possible. Either (1). The new footage is a recreation or replica event, using the PGF footage as the guide, and trying to reproduce it with a human costumed performer; or (2). It is a rehearsal, a practice run, to examine and look for weaknesses to correct to make a second film more realistic and believable. While I remain absolutely confident the explanation is the former, a replica, the documentary producer and director are presenting the latter option as the answer, a rehearsal for supposedly hoaxing the PGF.

To prove it is a rehearsal, one must prove that this new footage was filmed prior to the PGF filming date of October 20, 1967. That is what the documentary attempts to do. First to clarify, in my physical examination of the film, I made the following determinations, based in part on the latent image data the manufacturer exposes onto film stock, but does not appear visible until the film is used in a camera and developed. Also, I examined other markings attributed to the camera itself.

My determination of data, which the documentary team filmed me making, was the following: That the new footage was filmed on 16 mm Kodachrome film camera stock; That the film stock has a manufacturing date code of 1966; that the film stock was manufactured at the Rochester, NY plant, that the footage was filmed with a Kodak K-100 camera, a single lens model, not the three lens turret model; and that the film I was examining was the camera original, not a copy.

The point of controversy is the date code of 1966. The PGF footage has a date code of 1967. This is where fact and fiction are being blurred or ignored by so many who cry "hoax." A film stock date code, embedded by the film manufacturer, is simply the date the film was manufactured. It has absolutely no bearing on when the film stock was loaded into a camera, exposed, and then developed. So, despite the fact that this film stock was indeed manufactured before the film stock used for filming the PGF, we cannot make any determination that the new footage was shot or developed before the PGF footage.

As an experienced film photographer back in the 1960s, I can personally attest to the fact that a photographer may buy film stock but not use it for months, sometimes even years after the purchase date. And the purchase date also doesn't consider how long the film stock was sitting on the store shelf before being sold. A film stock may have a

recommended "use by" date for best results, but film can be used for many years, even decades after manufacturing, and still yield good results. Virtually the only fact that can be determined by a film stock date code is that it cannot have been filmed and developed in a year before the date code. But after the code, any year is possible.

So we must realistically ask, how did the documentary team make their determination that this new footage was filmed and developed before the PGF, thus making it a rehearsal, not a replica? To quote the documentary director, Marq Evans, who posted this on a Reddit chat about making the documentary, Mr Evans wrote: *"It is the film stock that is from 1966 but analysis of the film itself by experts determine it was shot and used in 1966 or early 1967."* In the court of public opinion, this quote appears to pass muster and be truthful. But under legal, scientific or academic rigor and rules of evidence, this assurance by the director fails totally as a factual determination.

Why does this statement fail as a factual determination? Let me count the ways:

1. *Generally, when expert analysis and determination is offered as evidence, one must first identify the experts by name and also make some presentation of the credentials of the experts, to demonstrate they have the expertise necessary to make a reliable factual determination.* The film team does not identify their "experts." Anonymous "experts" are useless for factual determinations.
2. *When experts evaluate a matter for determination, they must look at specific evidence, and a full disclosure of exactly what that evidence is must be transparently presented.* You can't simply say "They looked at the film" because that is uselessly vague. I personally looked at the film and made no such determination. Did they examine the latent image data of the manufacturer, did they examine any stamping or coding the developing lab might have printed onto the film stock, did they examine the camera aperture or camera ID marks, did they examine any punch code numerals on either the film stock or head leader, did they examine any handwriting on the head leader, or did they examine actual image data in the film frames, and if so, what specific data in which specific frames? In this documentary, what evidence, specifically, did these "experts" examine. We are never told. So we cannot examine that same evidence and review the determination, to see if it holds true on re-examination by other experts.

3. *Given the conclusion is a determination of when the footage was shot and developed, we then must ask, how was this determination of time established.* Traditionally, establishing a date for filming uses camera reports, production call sheets, other production records, like filming permits, crew pay stubs, etc. None are offered. Also, traditionally a lab processing date is established by a customer receipt, a lab work order, other lab documentation of processing activity, and some reference customer or work order number that connects the date to the customer and the film footage. But again, nothing is offered. Additionally, any such documentation would have a specific calendar date, a day and maybe even a time of day, not a vague "1966 or early 1967." So we can conclude they have no documentation determining the date of filming or developing.
4. *It is possible to use image data in the footage to determine a date.* For example, if in the footage, a newspaper was filmed at a news stand or in a sales dispenser, and we could clearly see the publication date of the newspaper, we might conclude the film was shot on that date. Seeing magazines on a sales rack, and being able to read the issue publication date, we might be able to determine a date within a month range. Or seeing automobiles in frame so their license plates show and we can read the plate registration tags; we might be able to determine a date in a 12-month window. But nothing described, and nothing I saw in viewing the footage suggests any image data can establish a date.
5. *So it would appear that the date window of activity, "1966 or early 1967", is a seasonal determination of winter, and might have been determined by an appraisal of foliage seen in the footage, suggesting a wintery landscape.* But such a determination would not determine a year, just a season of the year. In like fashion, looking at the PGF, we could determine the footage was photographed in the autumn time, because of the vibrant red leaves on many trees, typical autumn color. But any such seasonal determination is not specific to a year. If these "experts" used the foliage to determine a wintery timeframe (1966 or early 1967), they could not determine the year. Instead of early 1967, it could be early 1968, 1969, 1970, etc.

So how was this "1966 or early 1967" determined? We do not know and the documentary team aren't telling. This is not science. This is public relations junk food for the masses addicted to junk food ideas. So, the so-called

"proof" the footage was shot before the PGF has no merit, as presented. Nothing has been proven to make the director's claim anything more than a mere claim, which is not evidence and cannot be used to determine a fact.

Thus, despite the documentary team's claim of being filmed before the PGF, and thus arguably proving it was a rehearsal, the fact is nothing has been proven and both a rehearsal and a replica filming are on the table as equal prospects to explain this footage. So now we must examine the issue and see what can be determined as to rehearsal (before the PGF was shot) or replica (after the PGF was shot).

To review, the similarities of the general staging and specifically the actor's walk are compelling, and more specifically one step where the actor in costume raises his right foot so the sole of the foot is vertical, that posture of the foot is exactly like as seen in PGF Cibachrome #72. We can confidently discount mere coincidence, because this is an uncommon walking posture for the foot. It had to be done with deliberation.

If the new footage is a rehearsal, and the PGF is authentic, there is virtually no way the actor could have anticipated how the spontaneous and uncontrolled PGF would be filmed, or what walking postures the subject creature might take. So, this combination, that the PGF is real and the rehearsal is staged, is simply beyond any logical explanation, unless one wanted to argue the director and actor of the new footage were psychic and could look into the future and see the PGF in their minds before it was actually filmed.

If the PGF itself is a hoax, then arguing that the new footage is a rehearsal makes sense, with the assumption the same person was directing the events, and the same actor was wearing the costume. But this requires one to prove the PGF is a fake, by some other evidentiary process. We cannot say the PGF is a hoax because this new footage only makes sense as a rehearsal if the PGF is a hoax, so it must be. This is a circular logic fallacy. And the "proof" that the new footage was shot before the PGF is a total failure, as evidence and analysis show, so that cannot be argued as the proof. Absent some proof the new footage was absolutely shot before the PGF, the rehearsal concept has no merit. Oddly, in a strict sense, even proving the new footage was shot before the PGF doesn't actually prove the PGF fake. To understand this, we must diverge with a brief explanation of how the PGF is analyzed, properly.

The PGF has been proven to be 100% real, an uncontrolled spontaneous event with a subject figure that is

biologically real as it appears and is not a human in a suit. The evidence for that proof is entirely in the image data taken from the analysis of the various film frames. The proof is lengthy and is presented in detail in my book, *When Roger Met Patty* (Munns, 2014). The proof uses analysis of the camera starts and stops, the analysis of the motion of the camera operator as he walks and films the creature, the ground terrain and the absence of any indicators of hoaxed or staged activity, the shadows on trees indicating the entire six segments were filmed within a matter of minutes, and not as a staged hoax would be filmed, studies of motion blur and what kind of camera movements would be required to achieve those blurs, studies of the body of the creature indicating the shape and size of the head is inconsistent with a human wearing a head mask, the fluidity of the breast mass indicating a fluidity that prosthetic costume technology of the time could not accomplish, elasticity of the skin and fur that a fur costume of the time was incapable of, a study of the contour of the fur on the back of the neck which is inconsistent with any fur suit technology of the era, and could not be replicated until new fur technology was introduced in 1984 (so the PGF creature predates this technology), and folds and contours of the creature body consistent with real human anatomy but features which would never be deliberately designed into a fur costume. The sum of this analysis confirms the PGF is 100% real.

What proofs that the film is a fake have been offered as a challenging counterargument? None.

David Daegling, in his 2004 book *Bigfoot Exposed*, evaluated the PGF at length and concluded, "Since of this writing, thirty six years have passed and definitive proof of a hoax has not surfaced." Donald Prothero and David Loxton, in their book *Abominable Science* (Loxton & Prothero, 2013) analyzed the PGF and the best they can do is try to link the PGF to a famous eyewitness account by a man named William Roe and say "if the Roe account is proven to be a hoax, the PGF likely also is." But Roe's account is simply a man's claim and cannot be proven true or false. So this also is a hollow and failed attempt at implying the PGF is a hoax.

Greg Long authored a book called *The Making of Bigfoot*, (Long, 2004) and he has 466 pages of claims, recollections, personal testimony and stories people told him. But Donald Prothero, in chapter one of *Abominable Science*, admirably described why such recollections and anecdotes are not evidence. In that discussion, he confirms "Anecdotes do not make a science. Ten anecdotes are not better than one. A hundred anecdotes are not better than ten."

And in another passage of that chapter, in response to the idea that if you have multiple anecdotes, they become evidence, another expert is quoted as confirming, "The plural of anecdote is not evidence." So Prothero's comprehensive analysis of why good science does not rely on anecdotes is a total repudiation of Long's book and its collection of anecdotes.

So, realistically we have no proof that meets the rigors of science and proves the PGF is a hoax, and one proof that it is real.

So where is this so-called proof the new footage is a rehearsal? It does not exist. And even if such existed, one would be required to falsify the alternative, to prove the replica idea is false, to achieve a complete proof of the rehearsal hypothesis.

Looking at the question from the standpoint of a replica, there is an abundance of logic to support this hypothesis. One of the most compelling bits of evidence is the unusual foot posture of the PGF creature seen in Cibachrome frame print #72, which shows the right foot raised in a manner that the sole of the foot is literally vertical, a rare posture for the foot in a walk cycle. It can be done but is extraordinary and rare. But the creature in the PGF does this. And the actor in the new footage does this exactly the same way, on the same right foot, identical to a remarkable degree. It is as if when the new footage was being planned, the people involved had a print of that PGF frame and studied it and specifically asked the actor to replicate this foot posture, with the right foot. For a replica, such a scenario is eminently logical. For a rehearsal, with a real uncontrolled follow-up, the idea is utterly irrational. Why would someone directing a first test run, a rehearsal, instruct the actor in costume to walk in an uncommon way, forcing his foot into a posture typical walk cycles do not take? If the goal was to try and achieve something realistic, the goal would be better served by allowing the actor to walk naturally, not in a seemingly contrived fashion.

Of course, one might ask, why did the creature in the PGF walk that way? One answer is the terrain was irregular, forcing the creature to step with greater care. And second, the creature has an unusual anatomical form, with a longer back and shorter legs than typical humans do, and this uncommon leg proportion changes how the rearward foot is raised to advance to a forward position in a walk cycle.

And if a rehearsal was being done, no one could anticipate the terrain of the Bluff Creek event where the PGF was filmed, because Roger Patterson had never visited that

specific terrain before, and thus would have no knowledge of how irregular it might be.

But secondly, the foot is white. In the PGF, it is presumed the real foot picked up some of the sandy terrain substrate and it stuck to the sole of the foot, lighting it somewhat. But it isn't white. It is light sandy grey. But people looking at the PGF are invariably looking at copies of the original, prints several generations away from the original, and with photographic film copies, each copy cycle tends to increase the contrast, so lighter things move toward white and darker things move toward black. Copy again, and the contrast shift increases further. So if the new footage is a replica, and copied prints of PGF film frames were studied, the foot sole looks white.

The new footage shows white feet on the actor costume, but the footage is camera original, not copied several generations, so we can conclude the new footage had a costume designed specifically with white feet. If the footage were a rehearsal, and the costume designer was striving for a realistic creature costume to accomplish a hoax, it would be utterly illogical to make that costume with white feet. Any costume designer capable of making something moderately realistic would reject white feet and make them a tan or pinkish beige natural color. So these white feet make absolutely no sense if this was the first try, and the goal was to study this and make improvements for a better realistic hoax.

But with a replica, the white feet make perfect sense. The costume designer looked at PGF film frame prints, was asked to replicate what was shown in those frame prints, and the feet looked white (due to the contrast buildup of copies) and so the costume designer replicated the white feet for this replica filming.

Similarly, the pattern of the walk by the suited performer, and the chasing of the performer by the camera operator, the total staging, has such similarity that a replica is really the most logical explanation.

So in dealing with this first issue, the rehearsal vs. replica hypothesis, we have no proof the new footage was filmed prior to the PGF, no logical explanation for the similarity (unless you can prove by other process or evidence that the PGF was hoaxed, which nobody can or has done), the replica hypothesis makes perfect sense for the remarkable similarities, which fail to make sense as a rehearsal explanation, and simply no way to break this impasse. So, any argument the PGF is a hoax must rely on other evidence and process, and none successfully proves it to be a fake.

Which brings us to the second major revelation of the documentary, the testimony of family members about Roger Patterson, who died in 1972, five years after he filmed the PGF. Roger's widow, Patricia, and his son, Clint, are reportedly offering claims that they know or believe Roger hoaxed the film. On the surface, family members, who presumably know the family secrets, claiming to know the film was hoaxed, has a powerful impact in the court of public opinion. But it has virtually no weight in a scientific or academic analysis.

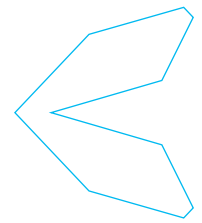
Neither of these people were present on the day Roger filmed the creature. They are not eyewitnesses to the event. Regardless of anything they witnessed before or after that day, they weren't there at the filming. There is a report that the son, Clint, claims to have witnessed his father burning a fur suit. There are other quotes and claims as well, but they all fall back on two classic fails. One is the total lack of empirical reliability of people's testimony, when there is no corroboration of said testimony with any form of empirical evidence. As described in the *Abominable Science* book, chapter one, there is a fine discussion on why testimony, even eyewitness testimony, is unreliable. But the second reason this fails is that the PGF has been proven to be real, to a 100% certainty, based on the image data evidence within the film. To argue some testimony changes that conclusion requires you consider how does the testimony change that empirical evidence in the film which proves the film authentic? If you cannot change that empirical evidence, and cannot change the methodology of analyzing that evidence, you cannot change the conclusion. The claims by Roger's widow and son do not change the evidence that proves the PGF real, so their claims, however colorful and intriguing, cannot change the conclusion that the PGF is real. They are entitled to their opinions that the film might be a hoax, but their opinions carry no weight in a scientific or academic proof.

To make sense of all the claims and anecdotes by Roger's son and others in this documentary, a great deal of other information would need to be disclosed, far beyond the limits of this review. But in essence, looking at the documentary claims and applying good science and a rational analysis of the quality and reliability of evidence, and striving to achieve a rational determination of facts and a truthful conclusion, the documentary simply fails as good science. It is merely a work of populist media titillation, seeking to dazzle in the court of public opinion, but throwing good science under the bus with reckless abandon, to achieve its goal.



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Parawize Journal: A Review

BOOK AND MULTIMEDIA REVIEW

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Parawize Journal: A Review
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Parawize Journal is a new quarterly peer-reviewed open-access publication that covers various topics in parapsychology and transpersonal psychology. The first issue was published on April 22nd, 2026 and it contains eight articles encompassing a range of topics including a critical evaluation of media skeptics' scientific claims on paranormal phenomena (Clément, 2026), working with psychics and mediums during spontaneous case investigations (Auerbach, 2026), practical lessons for ghost hunting from parapsychology (Williams, 2026), using AI tools in parapsychological research (Corne, 2026), AI and collective shadow material (Patel, 2026), a response to a prior published study in which there is ongoing debate between the anomalous episodic communal kinetic occurrences (AECKO) approach to spontaneous cases and the haunted people syndrome (HP-S) model (Auerbach et al., 2026), direct spiritual intelligent intrusion (DSII) (Brocas, 2026), and an article about a mystics' visions and mystical experiences having come from either a psychological or preternatural source rather than genuine divine revelation (Gallagher, 2026). One article was a reprint with permission (Gallagher, 2026; Pitstick & Gallagher, 2025), two were used for a presentation at a conference or a massive online course (Auerbach, 2021, 2026; Williams, 2023, 2026), and one was an article that originally was uploaded on Academia.edu, but later removed (Auerbach et al., 2026).

The articles are in a variety of formats even though a formal structure is required, but there is an allowance based on the submission type (Parawize, n.d.). Some articles followed a formal introduction, materials and methods, results, discussion, and references formatting, while others were more narrative in style. This is different than what I see in other peer-reviewed academic literature that covers frontier science topics in which a formal format is routinely followed.

Replication potential, integration with existing literature, transparency of limitations, handling of alternative explanations, and statistical quality should be considered when determining the quality of an article itself and the overall quality of the journal. These are even more important for frontier science fields such as parapsychology. Because the first volume is so new, its articles did not yet provide the kinds of methodological



details—such as information needed to judge replication potential, statistical rigor, or study limitations—that are typically expected in established scholarly journals. As a result, it was difficult to evaluate these aspects. Future volumes may offer a stronger basis for assessing these factors as the journal develops. The articles did, however, include references and showed engagement with the existing literature relevant to their topics. Finally, alternative explanations were present in the Auerbach et al. (2026) since it addressed a competing model to the one proposed in the article. Most (minus the AI articles) were psi-proponent based.

The authors were of varying backgrounds and education levels, including citizen scientists, master's- and doctoral-level researchers, and an MD. This provides a broad level of perspective, and the differences in the articles were readily apparent based on author background and academic training, resulting in different levels of academic rigor and ease of reading. Scholarly work can be done by and published by a wide variety of individuals with various academic backgrounds, so I am not implying this is a negative on the authors, articles, or the journal. But a certain level of academic standard should be expected when published in peer-reviewed academic publications, and it is possible for all to hit this mark.

Evaluating a new journal requires looking into how it operates. Academic and scholarly publications require peer review rigor, editorial transparency, ethics policies, indexing, and institutional credibility (Garfield, 2006; Moed, 2005). My next part of the review of *Parawize Journal* uses established criteria for academic publications and explores its organizational connections to a wider ecosystem that includes Paranormal Daily News and the *Deadly Departed* podcast.

Peer Review and Editorial Standards

A clearly defined peer review process is a strong indicator of a legitimate journal. *Parawize Journal* uses a double-blind peer review system. According to its policies, manuscripts undergo an initial editorial screening followed by review from at least two independent reviewers with relevant expertise.

The journal has an editorial independence statement, asserting that publication decisions are based on scholarly merit rather than external influence - such as commercial or outside pressure.

Transparency in editorial personnel is another important marker. *Parawize Journal* publicly lists its editors: Loyd

Auerbach, Jock Brocas, Dr. Richard Gallagher, Dr. Pascal Michael, and Dr. Elliot Van Dusen. The editorial board appears relatively small and with concentrated expertise in paranormal subjects and involvement, parapsychology, and transpersonal psychology. Other interdisciplinary journals draw editors from a variety of fields, such as psychology, neuroscience, philosophy of science, statistics, and other related fields. Broader representation would strengthen the *Parawize Journal's* credibility.

Guidelines, Publication Ethics, Infrastructure, and Accessibility

Parawize Journal's submission guidelines reflect normal accepted academic standards. Authors are required to use APA 7th edition formatting, provide structured abstracts, include methodology sections, and submit blinded manuscripts. The journal also requires plagiarism screening and will reject manuscripts above a 15% similarity threshold. These are common requirements for responsible publishing that are present in other academic peer-reviewed scholarly journals. Overall, the journal's submission and ethics policies are similar to those of established scholarly outlets.

Parawize Journal uses the Open Journal Systems (OJS), a widely used platform supporting structured workflows for submission tracking, peer review, editorial management, and digital archiving. The journal also addresses digital preservation, an open-access policy, copyright and licensing, author fees, and ethics and privacy statements. These operational details are consistent with legitimate scholarly publishing practices. It is important to note that the journal does not exhibit common predatory red flags, such as guaranteed acceptance, fabricated impact factors, or misleading indexing claims.

Limitations

Despite its strengths, *Parawize Journal* faces several limitations that are common in early-stage journals. Two limitations are the lack of indexing and citation metrics. There is no major indexing service such as Scopus, Web of Science, PubMed, or DOAJ. Indexing is not a guarantee of quality, but it is a form of external validation. It also increases discoverability when used. The journal currently lacks metrics such as Journal Impact Factor, SCImago Journal Rank (SJR), CiteScore, and Eigenfactor. While metrics should not be treated as direct indicators of quality (Garfield, 2006), their absence makes it difficult to assess the journal's reach and influence in a wider context.



Parawize Journal is not affiliated with an academic institution or professional organization. It is part of a unique paranormal organizational ecosystem, which appears to be part of a coordinated media-and-research network centered around Paranormal Daily News (PDN) and the *Deadly Departed* podcast.

PDN functions as an overall platform. It is described as an online paranormal/parapsychology media outlet focused on education, commentary, interviews, and public-facing research communication (Paranormal Daily News, n.d.). The two editors of *Parawize Journal* - Loyd Auerbach and Jock Brocas - also have significant roles in PDN.

Jock Brocas is the founder/editor of PDN, the host of the *Deadly Departed* podcast, and the co-founder of *Parawize Journal*. He has been actively involved in studying consciousness, anomalous phenomena, parapsychology, and transpersonal psychology for 20 years. Brocas is an author and researcher with several published books and numerous articles exploring the intersection of scientific inquiry and spiritual experience. He works to create dialogue between academic researchers, practitioners, and the broader public (Brocas, n.d.).

PDN also lists Loyd Auerbach as head of parapsychology. Loyd Auerbach holds a master's degree in parapsychology and is a widely known figure in parapsychology and the paranormal investigation community. He has 45 years of experience investigating paranormal phenomena and over 40 years teaching the subject. He serves as Director of the Office of Paranormal Investigations, President of the Forever Family Foundation, and is affiliated with the Rhine Research Center and Rhine Education Center. Auerbach is also known for his performance persona "Professor Paranormal," blending scientific insight with public education and entertainment (Auerbach, n.d.).

The *Deadly Departed* podcast is PDN's audio/video extension. The podcast is hosted by Jock Brocas; it frequently references PDN projects, and features recurring guests from the same parapsychology community. Episodes, along with PDN posts, describe *Parawize Journal* as a PDN-connected initiative, and the podcast has already covered one topic and article that appeared in the journal - the AECKO article (Auerbach et al., 2026). It also promotes PDN's educational and community programs.

Parawize Journal is the formal publication extension of this ecosystem. Jock Brocas founded the journal along with Loyd Auerbach. The broader "Parawize" brand does seem to predate the journal through "Parawize Talks," which is an educational initiative launched by PDN.

What are the implications of this interconnectedness and what does it mean for the *Parawize Journal*? The three connected entities - PDN (media hub), *Deadly Departed* (podcast), and *Parawize Journal* (research publication outlet)—suggest an integrated ecosystem with shared leadership, branding, contributors, and audience. This integration is not inherently problematic, but it does raise questions about editorial independence, potential conflicts of interest, ideological alignment, insularity of peer review, perceived objectivity, a potential echo-chamber effect, and the journal's position relative to mainstream scientific skepticism.

The ecosystem appears to lean toward psi-positive and survival-research advocacy, positioning itself as a counterweight to formal skeptical organizations such as the Committee for Skeptical Inquiry (CSI). They appear to be attempting to bridge the gap between ghost hunters/paranormal investigators and parapsychology. This is not a bad thing, as I have been hoping to see a coordinated effort in this area. However, this context is important for one to form an informed opinion on the journal's identity, audience, and potential biases. This may influence reviewer selection, editorial framing, topic emphasis, and openness to skeptical or critical perspectives. This does not invalidate the journal's work, but it does place the journal within a potential perceived partisan community rather than a neutral academic environment.

Concluding Thoughts

Research on anomalous or paranormal phenomena often faces skepticism within mainstream academia. Nothing less should be expected for *Parawize Journal*. The journal's long-term credibility within these frontier science fields will depend on consistently strong methodological transparency and interdisciplinary participation along with strong research and academic rigor.

Parawize Journal is an emerging specialty journal. It has several positive indicators - double-blind peer review, transparent editorial policies, plagiarism screening, ethics requirements, APA formatting standards, use of Open Journal Systems, and absence of predatory red flags. However, the journal remains in an early-stage and faces limitations typical of new publications, including lack of major indexing, absence of citation metrics, limited institutional affiliation, narrow editorial representation, and developing publication history.

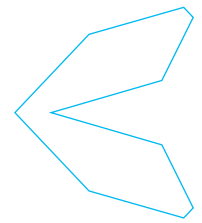
The connections between *Parawize Journal*, Paranormal Daily News, and the *Deadly Departed* podcast suggest that

the journal is part of a well-linked media-and-research ecosystem with an ideological trend toward psi-positive interpretations of anomalous phenomena. This structure could influence perceptions of editorial independence and scholarly neutrality.

Parawize Journal's long-term credibility will depend on maintaining rigorous peer review, publishing methodologically strong work, and attracting broader interdisciplinary participation. For now, I view *Parawize Journal* as a developing niche outlet whose scholarly standing is still taking shape.

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CORRESPONDENCE

The *Journal of Scientific Exploration* is an Important Forum for Exploratory and Visionary Science

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Houran and Orcutt (2026) have written a powerful editorial addressing the ever-growing importance of “*niche journals*” that “*play a vital yet often underrecognized role*” in fostering frontier science. Houran and Orcutt wrote:

“In particular, they serve as irreplaceable incubators where high-risk, high-reward ideas can be proposed, critiqued, and iteratively improved before they face the stringent demands of mainstream, high-impact venues. Niche journals are not sidelines; they arguably are the experimental engine room that primes bold ideas for broader dissemination, where validation in cross-disciplinary, preeminent journals can catalyze the paradigm shifts in method or theory that reshape whole fields.”

Reading their scholarly editorial, I was reminded of two scientifically unseemly experiences I had involving mainstream journals that speak to this increasingly challenging issue for science and society. One instance was briefly reported in this journal (Schwartz, 2016), the other is being revealed here for the first time. Both instances are shared in the spirit of acknowledging the continuing challenges present in the publishing of frontier science and the recognition and appreciation of high-quality peer reviewed niche journals (Houran and Darby, 2026). Paraphrasing a metaphor inspired by a colleague, this correspondence is an expression of ‘salutary’ rather than ‘sour’ grapes.

In brief, my 2016 Letter to the Editor of the *Journal of Scientific Exploration* began:

“Cardena (2015) has provided an important and timely service by voicing his concerns about past and present censorship in science in general, and of psi in particular. Coincidentally, I had just experienced an apparent instance of censorship in Psychological Science. Thanks to Cardena propitiously sharing this article with his peers, I was inspired to write this brief Letter to the Editor and summarize the circumstances of my recent experience with the hope that this kind of suppressive practice can be addressed more openly. At some point, mainstream science should own up to this unfair censoring tactic concerning challenging and controversial research in science in general and psi research in particular.”

To illustrate the instance, I encouraged the reader to consider what he or she would conclude from the following:

1. You submitted an article regarding a triple-blind experiment involving claimant evidential mediums to the journal *Psychological Science*, and you explicitly acknowledged the innovative and controversial nature of the research.

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2. The editor wrote back and said, “*I do not perceive your evidence as persuasive.*” No explanation was provided. The manuscript was rejected by the editor, and therefore was not sent out for extended reviewer comments.
3. You wrote back to the editor and indicated that this terse sentence was subjective and vague. You requested that the editor provide a brief paragraph or two explaining how he reached this decision.
4. The editor wrote back and said no. He stated he would not provide an “*extended explanation.*” He said this was his choice about how he would “*invest his limited time.*”
5. You wrote back to the editor explaining your history of prior positive experiences in working with editors at the AAAS journal *Science*. You requested that since he was this busy, that he reconsider sending the paper out for extended reviews which could confirm (or disconfirm) his seemingly vague subjective impressions.
6. The editor wrote back and said “*Sorry, Dr. Schwartz, but no.*”
7. You wrote back to the editor and asked him if he was sure about this decision, explaining that some people might interpret this as evidence of bias or prejudice about the research area.
8. The editor made the choice to not respond to this email.

My account of this instance of censorship by *Psychological Science* (in 2006) is available at <https://journalofscientificexploration.org/index.php/jse/article/view/1007>. The triple-blind mediumship experiment was subsequently published in *EXPLORE* (Beischel and Schwartz, 2007).

I later experienced a more scientifically unseemly instance of editorial censorship by *Frontiers in Psychology* in early 2021, and it was frankly discouraging.

Again, I invite the reader to consider what you would conclude from the following:

1. You were informed that the journal *Frontiers in Psychology* had a call for papers on methodology in consciousness studies, and you submitted the required 1,000 words pre-submission abstract which you titled “Conceptual and experimental methodology for reexamining the relationship between consciousness and the brain.” Your abstract included a summary of the replicated findings of six large scale original experiments. Your abstract was positively received by the action editor, and you prepared and submitted a 12,000 words manuscript for review.
2. However, after waiting for a few months, the action editor emailed you indicating that “*only 4 of the 250 reviewers invited posted their comments.*”

3. You learned that of the four reviews submitted, only one provided a serious review (approximately 1,600 words). It focused almost exclusively on philosophical and theoretical issues and recommended resubmission. By contrast, a second reviewer literally “*apologized*” for not reviewing it citing “*how heavy it is re: data analysis / experimental designs.*” You then discovered that the other two reviewers each wrote a brief paragraph, and **they did not comment at all about the research methods or the detailed findings.** In other words, none of the four reviews addressed the innovative methods or the replicated results.
4. You were startled that the third reviewer wrote that “*this is a NONSENSE manuscript*” (caps used by the reviewer), and he wrote it twice. I have quoted the first and last sentences of the reviewer’s summary evaluation below; I have underlined some phrases suggesting bias:

“This is a pseudo-scientific manuscript whose main purpose is (1) to promote the belief in survival of consciousness after physical death, and (2) to advocate the claim that the brain is not a creator, but a receiver of consciousness...”

“Because the main claim of the author of the possibility of disembodied (i.e. “brainless”) consciousness contradicts all current physical theories, my opinion is that this manuscript is not suitable for publication in any natural science journal.”

5. You subsequently discovered that the fourth reviewer expressed even more bias. I have included his paragraph comments below, with underlining added.

“The paper is an attempt to show the existence of spirits capable of having an effect on the material world. The paper is structured as a sneak attempt to disguise its objective as an elaborate and technically sophisticated experimental setting. Moreover, the paper deploys several rhetorical techniques to smuggle an unsupported hypothesis. Among them:

- a reasonable but otherwise unconnected argument against internalism and neuroscientific approaches to consciousness (which I happen to agree with) - various arguments about the importance of open-mindedness and the like. As

it is the experimental part is totally unconvincing and the paper is a collection of slights of hand (in the negative sense)."

6. You suggested to the action editor that this set of reviews did not fairly examine the methodology nor the experimental findings. The action editor's response was that he could not obtain other "eligible experts, in order to see your paper endorsed."

I was reminded of my previous experience with *Psychological Sciences*, and my Letter to the Editor of JSE. Because I was preparing to retire from my academic position at the University of Arizona, and then moving my laboratory off campus, I decided to put the manuscript aside.

However, due to the strong encouragement of some of my colleagues, I decided to update the paper and submit it to the *Journal of Scientific Exploration*. I was hoping that the methods and findings would receive the examination they deserved.

The editor received three very detailed reviews totaling approximately 4,400 words. The combined reviewers' thoughtful and thorough evaluations served the ideal peer review functions of detailed examination of theory and experiments, not merely in helping maintain quality control, but in improving the analysis and communication of work. In fact, the editor's and reviewers' collective analysis led to my converting the manuscript into two papers, one focusing on theory and methodology (Schwartz, in press a), the other on the replicated findings from the six experiments (Schwartz, in press b).

Here is the encapsulated summary of one of the reviewers of the revision papers:

"This reviewer really supports the publication of this paper as they are intrigued by the ingenuity and creativity of the instrumentation designed to detect PMPs. Since this device was refined into an automated system that could run multiple repeated measures without any human intervention, it should be possible to fine tune this system even more in order to optimize the measured signal detection and reduce the noise inherent in the communication channel."

In my earlier 2016 JSE Letter to the Editor, I commented:

*"Journals such as the *Journal of Scientific Exploration* and *EXPLORE: The Journal of Science**

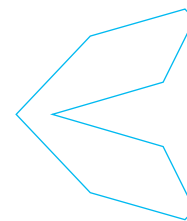
and Healing were created to provide a more open forum for exploratory and visionary science. The website <http://www.opensciences.org>, formed in response to the 2014 International Summit for Post-Materialist Science, Spirituality, and Society co-organized by Gary Schwartz and Mario Beauregard from the University of Arizona and Lisa Miller from Columbia University (see Beauregard et al., 2014), is attempting to foster the kind of scientific openness and integrity expressed by Cardena (2015)."

Readers of the *Journal of Scientific Exploration* appreciate the essential service that JSE provides for all of us, scientists and society in general. Ideally, scientific publications that profess to communicate 'frontier' theory and research will evolve and honor this chosen opportunity and responsibility. I hope the Houran and Orcutt (2026) editorial is widely read and appreciated.

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Felicia Parise (1938-2026)

OBITUARY

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Felicia Parise around 1970

Felicia Parise, who made a significant contribution to our knowledge of psi and consciousness, died on January 7th of this year, three days after the death of former JSE editor Stephen E. Braude, who admired her courage and talent and wrote the introductory commentary to the reprint of Charles Honorton's paper on Felicia and my 2013 interview with her. (Braude, 2015)

Parise demonstrated that it was possible for a person with some psi talent to learn to develop and utilize psychokinesis (PK). Unfortunately, it came with a cost.

This attractive, auburn haired young woman worked at Brooklyn's Maimonides Hospital as a medical technician in the Department of Special Hematology in the late 1960s-1970s. At that time the dream telepathy experiments that were to become famous were ongoing (Ullman et al., 1974) and volunteers to act as participants were being sought.

She was not interested but a friend entered Felicia's name. She was tested by Charles (Chuck) Honorton, did very well, and was asked to participate; becoming one of their most talented percipients, not only scoring high on the telepathy tests but at times reporting precognitive dreams.

She was chosen to be one of the two subjects in the celebrated "Grateful Dead" experiment and while she scored only one "direct hit" on the last night's target, it was found, interestingly, that her other three responses suggested that she was displacing her psi in time, both backward and forward (i.e., post- and precognitively). (Ullman et al., 1974, pp. 174-176)

Dr. Montague Ullman who headed up the Dream Telepathy program, returned from Russia in the early 1970s bearing a film of Nina Kulagina demonstrating her ability to move small objects psychokinetically. Felicia, the lone woman in the room, was rather upset at the level of not only skepticism but derision expressed by many of the men. She decided that she would attempt to do what Kulagina did. After all, she thought, she hadn't known that she possessed telepathic talent until recently. She thought she could do it and it was worth a try.

She began practicing with a small plastic pill bottle containing an ounce or so of alcohol in which she stored her false eyelashes at night. She placed it on her kitchen counter and tried at first to be calm and visualize it moving. When that didn't work, she emulated Kulagina, who she remembered looked very intense and excited, so she tried "working up an excitement." (Pilkington, 2015)

One evening after work and a visit with her ailing grandmother, who was a patient in Maimonides, she resumed her attempts to move the little bottle. The breakthrough came when a phone call interrupted her, telling her to come back to the hospital because her

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grandmother was dying. As she reached for the bottle to put it away it moved away from her.

After the funeral, when she was back to her usual routines of work and family she returned to the little bottle, knowing now that she *could* move it. Eventually she succeeded and when she was confident that she could demonstrate her ability she did two wise things: she asked a man, to whom she was introduced at a party and told he was a photographer, to film her moving the vial (as well as deflecting a compass covered by a bell jar) and later called Chuck Honorton to come to her Brooklyn apartment and observe what she could do.

Chuck, skeptical at first, turned pale with shock when he saw the little vial move, but after setting about to find an alternate explanation finally had to concede that she could do as she said *and* that PK was genuine! (Honorton, 1974, 2015)

With Honorton's and Ullman's encouragement Felicia went on to improve her skill at moving objects and deflecting compasses. The experimenters, even though they trusted her implicitly, used their own compasses and would pull her hands away unexpectedly in case minute magnets might be hidden in her fingernails.

She was able to influence Dr. Karlis Osis's random generator instruments at the American Society for Psychical Research (ASPR) in Manhattan and traveled to FRNM (The Foundation for Research on the Nature of Man, forerunner of the Rhine Center) in North Carolina where she participated in a series of experiments, e.g., affecting anesthetized mice, with Graham and Anita Watkins (Watkins & Watkins, 1974).

The Watkins couple later set up more extensive PK tasks for Felicia. They tested the compass they were to use. It was found to indicate approximate north and to be easily affected by either a small magnet or a steel knife blade. A pack of unexposed film was put under the chair on which the compass and a metal detector rested. Three additional packs of film were put at various distances from it.

When the compass needle began to move, the sound frequency of the metal detector changed "whereupon a total shatter of the tone occurred; this could be artificially simulated only by placing a very large metal mass (a two-pound roll of solder) in the field coil. The compass needle moved westward approximately 15 degrees over a period of about two minutes, with a slow, smooth motion, and remained there.

An exhausted Parise was disconnected from the polygraph and walked to the far corner of the room. But the compass needle stayed at 15 degrees off north and was

totally unaffected by the knife blade or magnet. When it was moved about four feet away from the spot, the needle returned to north and was easily affected by the metal. When it was returned to the original spot on the chair, it moved back to 15 degrees off north and was impervious to the metal's influence.

They repeated this procedure several times with the same results. The needle gradually returned to its normally expected behavior over a period of about 25 minutes.

(This "linger effect" has been noted in other PK experiments with resuscitating anesthetized mice, e.g., and in Geller's metal bending.)

The other effect of note in this experiment was that the pack of film underneath the compass was almost totally exposed and the other three packs were partially exposed, "the amount of exposure decreasing in proportion to the distance between the film and the compass." (p. 134)

Performing these PK tasks however took a physical toll, as Kulagina and others had demonstrated. Honorton (1974) noted that after a successful session, Parise would experience difficulty speaking for a few moments. She would perspire freely during the session,--unusual for her--her eyes and nose would run and she would tremble.

This grueling session took an emotional toll as well. It was the last straw for Felicia. Honorton reported that she became withdrawn, even hostile, and refused to speak to him during most of their stay in Durham. He confesses: "I failed to appreciate what a profound impact the development of this ability had on her. In my eagerness to firmly establish the genuineness of her PK ability, I ignored the increasing indications that it had become too much of a strain for her. ... She had gotten into it ... to satisfy her own curiosity ... Now there were all these incredulous people making demands on her to perform ... The tolerant amusement with which she had earlier greeted skepticism now changed to impatience, frustration, anger, and, finally, to rage." (Honorton, 2015, p. 73)

Felicia was also unhappy because since her PK ability had become known that seemed to be all researchers were interested in, whereas she wanted to do more of the telepathic experiments. However, here too she became frustrated. The targets at that time were always famous, mostly impressionist paintings. Familiarity with much of the target pool led to boredom and what she called "super saturation," likely fostering guessing rather than "just letting it happen." (Pilkington, 2015, pp. 102-103)

And then there was the BBC fiasco: The BBC wanted to make a TV film about the dream experiments. They were

briefed on the procedure but even though they knew little about psi functioning were allowed to choose the target pool of pictures. (The first mistake!) The “sender” was another star percipient, Malcolm Bessant who was in London. Felicia was wired up and asleep in the Maimonides lab in Brooklyn.

Unbeknownst to her, the show’s officials were listening in to her descriptions of her dreams each time she was awakened. When in her first report she mentioned a couple and a child the producer, *who knew what all five target pictures were*, completely contaminating the experiment, declared that he knew of what she was dreaming: a picture of Mary, Joseph and the baby Jesus!

For the rest of the session, he was concentrating on that photo so it’s no surprise that Felicia chose that one—he had been “feeding it” to her all night! The correct target was of Sonny Bono, Cher and their child, Chastity (another goof, having two pictures with similar themes in the same target pool). Therefore, to the vast TV audience, it was a failure.

Felicia, already a very private person, withdrew from all psi experimentation and concentrated on her valuable medical work.

Of course, her psi abilities were still functioning. In 2001 she decided to sell her Brooklyn house and move to an apartment in Manhattan’s Greenwich Village. The numbers 911 kept appearing in her mind. She couldn’t get it out of her thoughts. “I had the feeling it was something big. Oh, I knew it was something: something was coming up but I couldn’t put my finger on it. I couldn’t get those numbers out of my mind. You know, they would just pop in my head for no reason. I’d be making dinner or something and I’d be thinking about that number.”

When the attack took place a friend reported that her face “got ashen,” but Felicia had had no idea in her waking,

conscious state, of what was going to happen. (Pilkington, 2015, p. 87)

Felicia Parise is remembered fondly by all who knew and worked with her. As Mario Varvoglis wrote when he heard of her passing:

“All of us at Maimonides respected and appreciated Felicia; she was strong, warm, and full of life. Although she mostly stayed out of the limelight, she was one of the few people who helped keep the idea of macro PK alive in the 1970s, and that, with no tricks up her sleeve.” (Personal communication).

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