

OBE UNDER HYPNOSIS - INITIAL EXPERIMENTAL RESULTS

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The OBE (Out of Body Experience) are not very rare in the healthy population but, since they are almost always spontaneous and uncontrollable by the experimenter, the study of their phenomenological characteristics and neural correlates is impossible during the actual experience unless simulations are used, or post-experience interviews.

It was only recently that Smith and Messier, using fMRI (Functional Magnetic Resonance Imaging), were able to study changes in neural activity in a young lady who was able to achieve an OBE state at will, suggesting that within this state of consciousness is a state of awareness that differentiates it from other states - for example, that induced by hypnosis.

Since late 2012 our research group has been successfully studying the possibility of bringing about an OBE state by way of hypnotic suggestions on participants with a high degree of hypnotizability and a willingness to experience this particular state of consciousness (see [OUT-OF-BODY EXPERIENCE INDUCED BY HYPNOTIC SUGGESTION. PART 1: PHENOMENOLOGY AND PERCEPTUAL CHARACTERISTICS](#) and [HYPNOTICALLY INDUCED OUT-OF-BODY EXPERIENCE: HOW MANY BODIES ARE THERE? UNEXPECTED DISCOVERIES ABOUT THE SUBTLE BODY AND PSYCHIC BODY](#)).

The advantage of this procedure is that, during the controlled OBE, it is possible to dialogue with the participants, given that the participants' control over their cognitive activities and vocal chords does not interfere with this state of consciousness.

A new scientific article recently submitted for publication entitled [OUT-OF-BODY EXPERIENCE INDUCED BY HYPNOTIC INDUCTION: A NEUROPHENOMENOLOGICAL STUDY](#) which I co-authored with [W. Giroladini](#), [G.M. Duma](#), [G. Mento](#), [E. Prati](#), and [P.E. Tressoldi](#), is the first neurophenomenological study of Out-of-Body Experiences (OBEs) induced via hypnotic suggestion.

The study was carried out on a sample of five participants chosen according to their susceptibility to hypnosis and their willingness to undergo this type of induced OBE.

The aim of this study is to integrate the phenomenological information about this particular consciousness state with different control conditions, for example, a state of deep hypnosis or that of simply imagining being in an OBE.

The ability to induce OBEs willingly therefore allows the study of their neurophenomenological characteristics with great accuracy as well as a comparison with other consciousness states, such as deep hypnosis or simply an imaginary OBE state.

If, as we expected based on experiences from previous studies and the many controlled OBEs under hypnosis undertaken for "training", the OBE state had been something altogether different from other states, we would have also found a different neurophysiological correlate, especially when interviewing the hypnotist (myself).

Their relevant personal data with fictitious names and previous hypnosis/OBE experience are shown in Table 1:

ID	Age	Sex	Hypnosis experience	HIP	OBE experience	OBE knowledge
Elen	43	F	Four sessions	8	Four, induced by hypnosis	Good
Annalie	58	F	Three sessions	9	None	Fair
Anton	47	F	Three sessions	9	Three, spontaneous	Good
Federic	24	F	One session	8	None	Fair
Daniel	64	F	Eight sessions	9	Four, spontaneous	Very good

Table 1. Participants' personal data and hypnosis/OBE experience

Participants' EEG activity was recorded using 14-channels of the Bionen® professional headset plus two auricular electrodes which served as reference points. The study consisted of one session for each participant and the room was soundproofed and dimly lit.

The session was comprised of six distinct phases, defined as follows:

- 1) Relaxation with eyes open for about 2 minutes;
- 2) ImagineOBE: Imagining as being out of body for about 2 minutes after given the following direction: "close your eyes and for two minutes imagine having an OBE";
- 3) Hypnosis: Induction into a hypnotic state via suggestion to attain an OBE state. The duration of this phase depended on each participant's answer and varied from around 7 to 9 minutes;
- 4) FreeOBE: Unrestricted OBE state for about 2 minutes; InterviewOBE: questions during OBE for 1 minute;
- 5) Repetition of phase 4: FreeOBE: unrestricted OBE state for around 2 minutes; InterviewOBE: questions while in OBE state for 1 minute;
- 6) Re-entry into body and relaxation with eyes open for around 2 minutes.

The beginning of each phase was recorded in a designated channel along with electroencephalographic signals, so that individual phases can be easily identified during subsequent data processing.

Details of the hypnotic and OBE induction procedure can be found in the Supplemental Material of the paper [OUT-OF-BODY EXPERIENCE INDUCED BY HYPNOTIC INDUCTION: A NEUROPHENOMENOLOGICAL STUDY](#).

All EEG recordings were processed by a trained expert, to eliminate the most common artefacts (like eye blinks, eye movements or constant oscillatory activity induced by external devices) and thus obtain "clean" recordings for examination.

The first available results were phenomenological: Table 2 summarizes the two OBE interviews conducted with each participant.

It is interesting to note the large variation in reported experiences, although all involved journeys to terrestrial and non-terrestrial places in order to experience new sensations and emotions. The ability to visit extra-terrestrial places and terrestrial ones inaccessible to the human body could simply be products of imagination or the participants' desires, but the descriptions of the experiences seem genuine.

Elen	Annalie	Anton	Federic	Daniel
<p><i>Where did you go?</i> I was up, in the sky, because I like watching things from above and I wanted to see how the sun lights up the earth.</p> <p><i>How does the sun do it?</i> I saw the light coming from right to left and hit this blue planet.</p> <p><i>Were you watching from the outside?</i> Yes.</p>	<p><i>Where did you go?</i> I was dancing near the sun, then I came back. At a certain point, I came down to earth again and went to Peru, in the forests (the Amazon?).</p>	<p><i>Where did you go?</i> I went to where I was in the previous OBE (watching earth and Mt Etna from above) and I wanted to once again feel what I felt before.</p> <p><i>And did you?</i> A bit less, but yes I did.</p>	<p><i>Where did you go?</i> To Mars...</p> <p><i>What did you see?</i> Nothing of interest: I lay on the surface.</p> <p><i>What is the surface like?</i> It felt warm... really warm.</p> <p><i>What did it feel like?</i> More or less like earth.</p>	<p><i>Where did you go?</i> I made a few journeys: I went underwater in the sea, on top of a mountain...</p>
<p><i>Where did you go this time?</i> In water. First of all I went into the ocean to see if things are visible in the dark: I wanted to know if things can be perceived like when they are outside, in the air.</p> <p><i>And can they be?</i> Yes.</p> <p><i>How do you perceive them, as in your physical body or differently?</i> I sense shapes.</p> <p><i>But can you feel the water temperature, its consistency, or not?</i> No.</p> <p><i>What shapes did you perceive?</i> Something like algae attached to rocks.</p> <p><i>Did you perceive fish or other animals?</i> Yes, marine animals.</p> <p><i>Known or unknown?</i> Known.</p>	<p><i>Where did you go this time?</i> I continued from where I was before, then I went to Nepal, with the monks. After that I went to the peak of the highest mountain (Everest) and stayed there, standing at first with arms out, then I sat and looked around.</p>	<p><i>Where did you go this time?</i> I wanted to contact someone higher up.</p> <p><i>Did you?</i> I felt enveloped: I could not see, but it felt like I made contact.</p>	<p><i>Where did you go this time?</i> Ireland.</p> <p><i>Did you see anything interesting in Ireland?</i> Cliffs, then I looked below and there was a bit of land on the sea. I went there and there was a small cave, not very deep.</p> <p><i>Was there anything inside the cave?</i> No, there was nothing when I went there, apart from the area where people sometimes go...</p>	<p><i>Where did you go this time?</i> I went to G's house (eldest son) to see the children (3, two of which are baby twins).</p> <p><i>Were all three of them there?</i> No, only one of them, a small one, then I noticed that G's father-in-law (deceased) was present in the house.</p>

Table 2. Questions and answers during the OBE state.

At the end of the session, each participant was asked the following question:

“Did you experience anything unexpected during the OBE?”. The answers are shown in Table 3.

Elen	Annalie	Anton	Federic	Daniel
<p>Access to unknown things and a far richer perception of the world around me.</p>	<p>The freedom to be and go around in joy.</p>	<p>I found myself in a place without time or shapes, without tangible space; I felt certain that there is a “higher” place where anyone can go. I did not expect to feel such peace and a feeling of love that is so important.</p>	<p>I did not know what to expect from this experience, also because it was my first OBE. Nonetheless, I can definitely say I was excited and amazed by my journey, which gave me an awareness I had previously only sensed I had.</p>	<p>A knowledge of being able to heal the physical body. That is all, because I had already experienced it many times.</p>

Table 3. Answers to the question: *“Did you experience anything unexpected during the OBE?”*

It's interesting to note that all participants report experiencing something unexpected with respect to both their previous knowledge about this state of consciousness and, in the case of Anton and Daniel, with respect to their spontaneous experiences.

EEG data analysis

The artifact-clean recordings were used to calculate the power corresponding to each EEG frequency band, separately for each epoch in every individual participant. The following frequency bands were considered: delta 2-4 Hz; theta 5-7; alpha 8-12, beta 15–29, gamma 30-45. Between each frequency band there were gaps to avoid possible overlapping 'boundary' effects. The power of each single band and conditions of the consciousness state were normalized within each participant and also between them, using the power measured in the initial Eyes Open condition as reference. This method allowed us to correctly calculate the relevant statistics. The results are shown in Figure 1 and Figure 2.

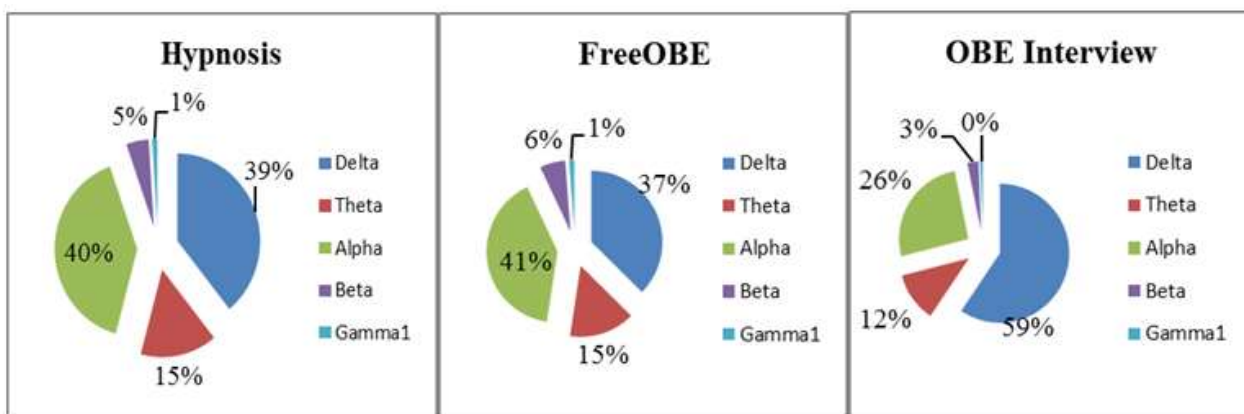


Figure 1: Power Spectrum Density percentages across EEG frequency bands for Hypnosis, Free OBE, and OBE Interview conditions.

When comparing the hypnosis state with the Free OBE and OBE Interview states, we note a significant similarity between Hypnosis and Free OBE, while **the OBE Interview state shows an important, about 20%, increase in the delta range, associated with an approximate 14% decrease in the alpha range.**

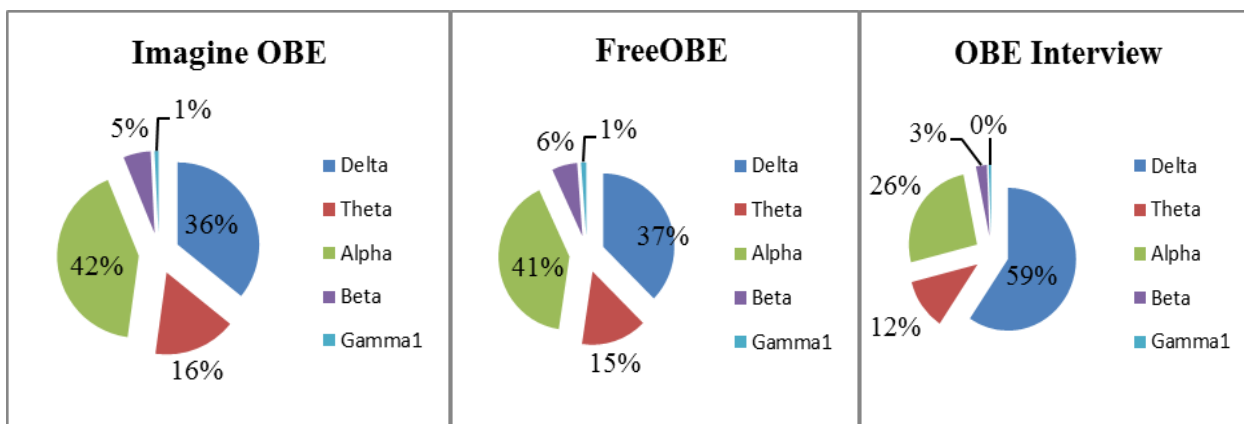


Figure 2: Power Spectrum Density percentages of different EEG frequency bands for Imaginary OBE, Free OBE, and OBE Interview states.

The Imaginary OBE and Free OBE states show no particular differences. However, **a large difference between the Imaginary OBE and OBE Interview states is apparent in an approximately 23% increase in delta for the OBE Interview, associated with an approximately 16% decrease in the alpha band.**

The peculiar increase in delta activity in the OBE Interview condition is clearly depicted in the EEG topograph presented in Figure 3 which represents the delta band changes with respect to the Eyes Open condition.

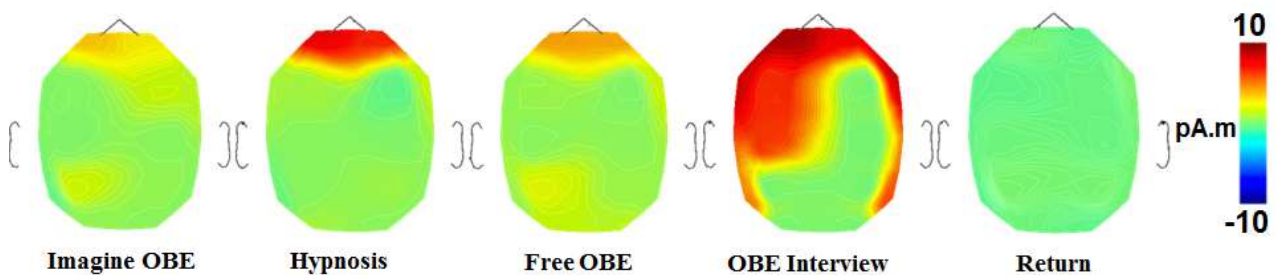


Figure 3: Changes in delta band activity in the five conditions relative to Eyes Open (red = increase; blue=decrease).

The statistical processing of EEG data reported in the article [OUT-OF-BODY EXPERIENCE INDUCED BY HYPNOTIC INDUCTION: A NEUROPHENOMENOLOGICAL STUDY](#) confirms without doubt the importance of the aforementioned results.

In order to further explore the characteristics of the delta band under the different consciousness conditions, we estimated the difference from the Eyes Open state of the imaginary coherence (iCOH)), which allows estimation of the phase-lagged coherence among the different EEG channels providing a functional connectivity index which is insensitive to the effects of volume conduction. The results, in agreement with the above, are shown in Fig. 4.

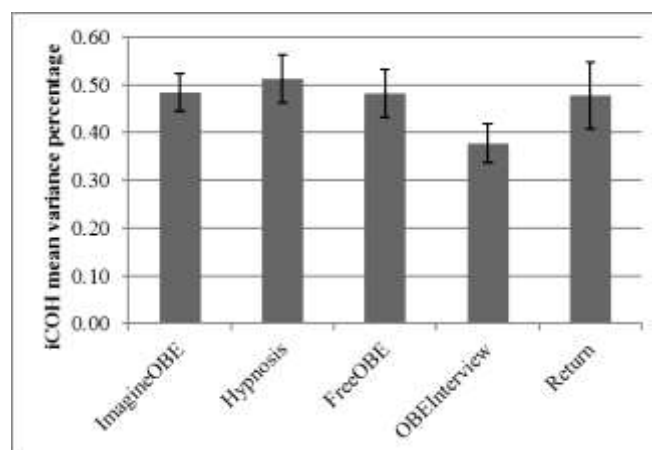


Figure 4: Means and confidence intervals of imaginary coherence variance percentage of the different conditions.

From a neurophysiological perspective, the major difference – with respect to all other control conditions – was an increase in the power spectrum density of the delta band when participants were required to answer questions posed by the hypnotist during their OBE state, suggesting that this could be the neurophysiological marker of this special state of consciousness.

The PCI test (Phenomenology of Consciousness Inventory)

The PCI (*Phenomenology of Consciousness Inventory*) is comprised of 53 questions requiring answers based on a scale with a range from 0 to 6, widely used for evaluating cognitive and emotional aspects of different non-ordinary states of consciousness. Its psychometric reliability and validity has been shown by many studies. The questionnaire was compiled individually after a lengthy explanation of the answering procedure for its various items, and was given to each participant after the OBE induction session to be filled in within the next day. For each participant an average score was calculated for the 12 main categories: **AE** = Altered Experience; **PA** = Positive Affective; **NA** = Negative Affective; **A** = Attention; **I** = Imagery; **SA** = Self-awareness; **ASA** = Altered state of awareness; **AR** = Arousal; **R** = Rationality; **VC** = Voluntary control; **M** = Memory; **ID** = Internal dialogue. The average scores of each participant are shown in Table 4.

ID	AE	PA	NA	A	I	SA	ASA	AR	R	VC	M	ID
Elen	4.6	2.8	0	3.8	4.5	6	6	1	6	5	6	0
Annalia	5.8	4.3	.16	4.8	5.75	4	5.7	0	5.3	2	5	0
Anton	4.6	3.6	0	4.8	5	5.3	5.7	0	3.3	1.7	6	5.5
Federic	3.3	1.6	0	3	5.25	5	2.3	1.5	5.7	2.7	6	0
Daniel	4.5	3	.8	4.8	5	5.3	5	.5	3	3.3	5	5
Mean (SD)	4.56 (.88)	3.06 (1.0)	0.19 (.35)	4.24 (.82)	5.1 (.45)	5.12 (.73)	4.94 (1.5)	0.6 (.6)	4.66 (1.4)	2.94 (1.3)	5.6 (.55)	2.1 (2.8)
Cardeña & Terhune (2016) n.11	3.36 (1.06)	2.32 (.98)	1.31 (1.35)	4.55 (1.35)	4.27 (1.12)	3.2 (1.04)	4.25 (1.39)	1.54 (1.74)	2.94 (1.76)	2.0 (1.03)	4.19 (1.25)	2.21 (2.04)
Effect size Hedges'g	1.12	.71	.91	.23	.80	1.88	.45	.59	.97	.79	1.21	.04

Table 4: Mean scores in the Phenomenology of Consciousness Inventory subdimensions of each participant.

In the last two rows of table 4, the average of all subdimensions of the five participants is furthermore compared to that observed by Cardeña & Terhune using a group of eleven participants in deep hypnosis. The difference between these two groups was quantified using Hedges' effect size *g*.

When we look at the effect size in bold type, it is easy to note the large differences between the consciousness states experienced by our participants and that experienced by those of the Cardeña, & Terhune study. Going from the largest to the smallest values we can see that the OBE experience was denoted by higher scores of Self-Awareness, Memory, Altered Experience, and Rationality, a lower score of Negative Affective and higher scores of Voluntary Control, Imagery and Positive affective, compatible with the phenomenology reported in cases of spontaneous or post-traumatic OBEs and with the theory of it being a cognizant and volitional mental state, even though its characteristic mechanisms are very different to the normal one.

Therefore, pending further confirmation, we can affirm that the state of consciousness induced in our participants differs substantially from that of deep hypnosis.

Disproving the theory that the activity in the delta band could be due to eye movements, a comparison of the Power Spectral Density from six anterior channels with that from six posterior channels (which should be more impervious to possible eye motion interference) actually shows a higher percentage of delta in the posterior channels: 86% vs 27% (Figure 5).

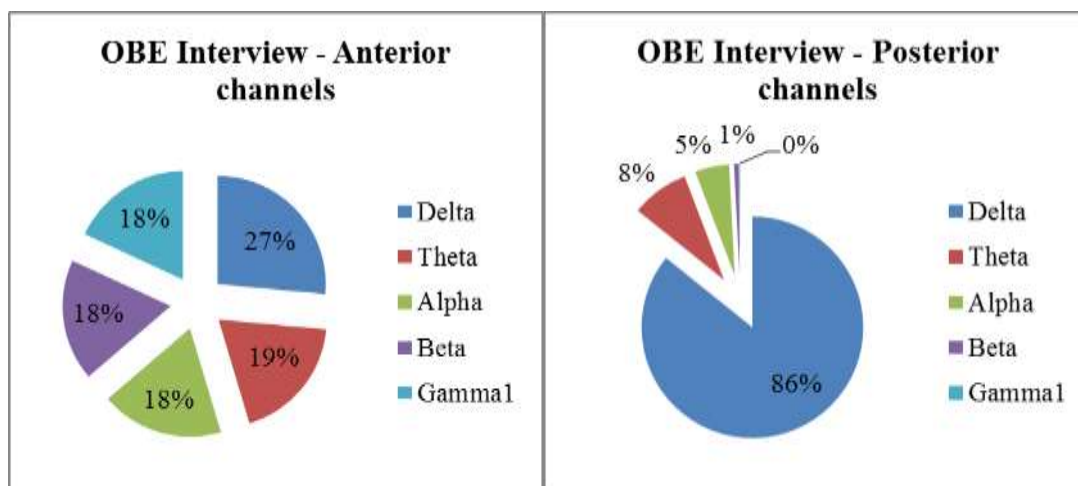


Figure 5: Anterior (Fp1, Fp2, F7, F8, F3, F4) vs Posterior (P3, P4, T5, T6, O1, O2) PSD percentages of the different EEG bands, in the OBE Interview condition.

It is also interesting to note that verbal responses to the hypnotist's questions while in the OBE Interview state correspond to a rapid increase in EEG activity, especially in the gamma1 band, but only in the anterior channels.

The differences between the OBE state – and particularly between the OBE Interview state – and those of Hypnosis and Imaginary OBE are rather specific and characterized by an increase in the Power Spectral Density and a decrease of connectivity of delta activity.

Although we don't yet know the reason for these differences, we are still at the initial stages and understandably need to collect more data to be able to construct a valid explanatory model.

In conclusion, we can say that the results of this study are decidedly important and more studies are being planned...