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# Art, Hallucination, and Embodiment

This essay will discuss visual perception as well as examine the relationship between art and hallucination. The paper is divided into three sections. The first section will explore phenomenological aspects of the Ayahuasca hallucinations described in Benny Shanon's book *Antipodes of the Mind*. In the second section, it will analyze certain aspects of abstract art. This art style will be used because it enables the viewer to form their own image from the constituent elements of the piece. With these two sections, the experience of hallucinations will be likened to viewing the world as an abstract art piece, and viewing abstract art will be likened to inducing a hallucinatory state. The third section explains a model that motivates this analogy by applying the theory of embodiment to a ven diagrammatic structure.

# Part One: Hallucinations

Ayahuasca is a psychedelic drug that induces visions as well as hallucinations in all other perceptual modalities<sup>1</sup>. The drug is created by combining parts from two plants: the vines of *Banisteriopsis caapi* and the leaves of *Psychotria viridis*<sup>2</sup>. The vine is cut, pounded, and then brewed along with the leaves, all in a ceremonial context, in order to create the Ayahuasca drink<sup>3</sup>. Shanon immersed himself in the culture of a South American tribe to gain knowledge about this practice. This drink is deeply rooted in this culture, being used for "for curing, for divination, as a diagnostic tool and a magical pipeline to the supernatural realm."<sup>4</sup>

Ayahuasca alters one's consciousness in many interesting ways. It confuses one's sense of self-agenthood, meaning one can no longer distinguish between one's own thoughts and those of other people. An individual is not sure whether (s)he actually owns his/her thoughts, or whether an external agent is forcing these thoughts. According to Shanon, it almost seems as if an external agent is implanting foreign thoughts into the mind of the person experiencing the hallucination.<sup>5</sup>

The identity of the participant is also affected. A person will identify with anything that (s)he looks at<sup>6</sup>. In essence, the person 'becomes' the inspected object. There is no separation between the object present in the world and the person; the person understands their complete state of being in terms of the object that is perceived. For example, if a person were to inspect a hammer and hold it in his hand, that person would become the hammer and exist as the hammer; there would be no distinction between self and hammer.

Not only does a person identify with an object, but the meaning of objects in the world changes. Mundane objects are understood to be part of a cosmic organization in which all parts play an intrinsic role<sup>7</sup>. In this way, "many phenomena pertaining to the Ayahuasca experience may be regarded as the products of affording the world an intense metaphoricity."<sup>8</sup> The drinker takes the constituents of reality to mean something else; they may appear to be one thing, but they actually represent a deeper structure. Shanon references this to the platonic theory of essences when speaking about the underlying structure of objects in the world. It is as if one is actually viewing the essences of things through the window provided by the object in the world.<sup>9</sup>

While intoxicated, a person interprets the con-

stituents of objective reality to be mere suggestions of what is truly there. The objects are taken as a metaphor for a deeper structure that is created by meanings attributed to a cosmic order. Mundane things in reality are recognized as a normal instance of a given object, but they somehow mean something different. Reality becomes less objective and more laden with the meaning derived from beliefs and intuitions. This in turn drives the hallucination; it drives the actual perceptual process of the drinker. For example, Shanon cites one instance of a man having a vision of Christ. Upon further questioning, the man admits that "what actually can be said about the vision is only the figure of a loving young man, clad in white and radiating light was seen."<sup>10</sup> The viewer did not necessarily see a being with a label 'Christ,' but rather saw a man fitting the description of Christ given by his religious history, and interpreted this man to be Christ. Shanon goes on to argue that any cognition is closely tied to the meaning one imparts on a scene, stating that "from a cognitive-psychological point of view, if the figure seen was identified as being Jesus, then phenomenologically this is indeed who was seen."11 His stance is that the meaning imparted on a scene will affect the actual perceptual experience. The reasoning behind this stance will be used later in the discussion of abstract art. The perceptual process of viewing abstract art is influenced by the meaning attributed to the scene at hand, and as such serves as a thread of similarity between art and hallucination.

Consciousness often loses its unity after drinking the brew. A person can become dissociated from their body and observe their previous identity from an outside perspective.<sup>12</sup> This can create recursive dissociation from identities, leading to an infinite regress of exiting the current identity and observing the previous identity from an outside perspective.<sup>13</sup> The dissociation can also be on a perceptual level, leading to a split in the visual field. A drinker will sometimes see half of their visual field as a hallucination while the other half remains objective reality.<sup>14</sup>

While under the effects of the drug, it is difficult to differentiate psychological states. One is unsure whether one is "perceiving or remembering, whether one is perceiving or imagning, [or] whether one is thinking or perceiving the thoughts of others."15 The mode of thought becomes cloudy; the normal boundaries between observation and imagination are diluted and these distinctions seem to become irrelevant. One exists in terms of the surrounding environment; imaginings becomes reality and thoughts may not be one's own. This would seem to impact one's theory of mind, "the ability to represent the mental states of others."16 If one is unsure if thoughts are self-generated or those of another individual, then one may start to question the extent to which other people have minds that are creating thoughts distinct from one's own. This leads into the next aspect, that of individuation.

Drinkers report a feeling of connectedness to all aspects of reality.<sup>17</sup> It is as if they are integrated into a kind of supreme consciousness. The distinction between self and other is diminished by the realization that they and everyone else are part of a larger whole. This agrees with the theory of mind hypothesis by making the intentions and thoughts of others irrelevant because each person is considered to be connected to a sort of super consciousness, and it is this consciousness that governs existence. One is also said to gain knowledge of a supreme sort: knowledge of the 'true' nature of reality. Also, the normal constituents of reality are seen as 'more real than real.' Sensory perceptions are intensified, resulting in a different interpretation of the objects that exist in the world.

Continuing along this same thread of individuality is the phenomenological report of varying senses of a coherent self. Participants often report losing their sense of self, or having only a slight remnant of their self.<sup>18</sup> This varies with the experience of the drinker; novice drinkers often completely lose their sense of self, while more experienced drinkers are able to maintain a more coherent sense of self throughout the experience.<sup>19</sup>

This concludes the summary of the phenomenological effects of the drug Ayahuasca. The third section of this paper will deal with creating a model of perception that is able to account for how an individual is able to experience these things in terms of everyday cognition. However, it is first necessary to talk about abstract art viewing and relate this experience to hallucination.

## Part Two: Abstract Art

Viewing abstract art is an interactive and engaging activity. The process has both a bottom up (autonomous cognitive processes influence higher order thinking)<sup>20</sup> and top down (higher order thinking drives the autonomous processes)<sup>21</sup> aspect. The bottom up approach to perception has been analyzed by Rudolf Arnheim, David Marr, and Gestalt Psychology. The theories presented by these paradigms will be summarized and applied to the viewing of abstract art. These models will be further elaborated on by including a top down element that drives perception based upon meaning attributed to a scene.

Arnheim proposes a theory of art perception that is largely based upon what he has termed 'psychological forces.' These are forces that arise from the physical qualities of elements on a page. He thinks that certain placement, size, shape, and relationships between elements directly affects the perceptual process, inducing tensions and weights stemming from a given arrangement.<sup>22</sup> For example, if a circle is placed slightly off center, it will then create a greater unease in the observer than if the circle was placed much off center.<sup>23</sup> This, he claims, is not a higher order process of evaluating the scene and making a response based upon thought, but rather a gut reaction; there are certain qualities on a page which are inherently pleasing or displeasing to the human perceptual processes.<sup>24</sup>

Marr has created a strict bottom up approach to perception that is based upon a computerized object recognition paradigm. This is a modular process which relies largely on a computer being able to recognize sharp value changes and noting these areas as most important.<sup>25</sup> This process is employed for a whole image to produce what he calls a 'raw primal sketch.'<sup>26</sup> This sketch consists of the crucial areas in an image that has significant value changes. This raw sketch then goes onto the next module further refining the sketch by techniques to produce a more information laden 'full primal sketch.'<sup>27</sup> This entire process produces a schematic replication of the original image. The next step, which addresses object recognition, applies gestalt rules in order to group objects based upon the principles of Gestalt psychology.

Gestalt psychology proposes a theory of grouping objects based upon general principles extracted from rigorous experimentation on the nature of human perception. These principles are: the law of proximity (close features will be grouped), the law of similarity (objects of similar form will be grouped), the law of good continuity (objects that demonstrate a certain smoothness will be grouped as one), the law of closure (gaps will be filled in if a figure appears as a coherent object), and the law of Pragnanz (the most notable and stable geometric form will be chosen).<sup>28</sup>

Multiple layers of perception occur when one views abstract art. At the base, one has the psychological forces described by Arnheim. Certain elements of the piece, such as balance and flow are simply felt. No higher order interpretation is needed for this to happen. This analysis of different layers of perception will be aided by a concrete example. Figure 1 shows a work composed by the author of this essay.

Arnheim thinks that darker colors have less 'visual weight' than lighter colors, and also that the bottom of the page is weighted heavier than the top.<sup>29</sup> Hence, this image would be balanced according to those terms because the bottom is darker than the top. The same is true for the two circles in the image. The bottom circle would normally have more weight, but its darkness creates a sense of balance with the lighter circle. These forces all act at a very low level of perception, he claims, without the aid of higher order thinking.

The green form in the center of the painting exhibits the law of similarity and continuity. The form is one coherent and continuous color, which leads the



Figure 1

viewer to perceive this as one object. The blue background, although it is interrupted by the dark circle at the bottom, is perceived as one coherent frame because the color is similar throughout. Motivating these gestalt principles would be Marr's approach of detecting various light intensities. Each object in the piece has a different light intensity which would be noted by his program and sketched out in the raw and full primal sketch. The gestalt principles would then be applied to arrive at coherent objects within the image.

In addition to the above analysis, the attribution of meaning to the art piece will influence one's perception of it. One could look at this piece, either alone or with another person, and say that the green figure in the middle looks like a body with the light blue region being the head. This would follow the law of Pragnanz because a body is a very stable shape that one is accustomed to seeing. However, this is gestalt grouping based upon higher order thinking. Gestalt psychologists hold that all of their laws appear only in bottom up perception, without any thought. However, Gestalt principles may be active on both levels of perception after one attributes meaning to a scene. Moreover, once this higher level Gestalt grouping takes place, it seems that another level of psychological forces arise, leading to a narrative interplay between the elements on the page. The human figure seen can be said to hold more visual weight, thus redistributing the psychological forces, therefore altering the physical perception of the art piece. It is in this way that viewing abstract art can be likened to a hallucination.

The meaning ascribed in this process influences what one perceives to be on the page. The perception is now altered and it would be hard to view this piece again without seeing the green form as a human body. This is the parallel with the Christ figure. Although what is seen is only a person clad in white, or a green form, the perception is based upon the interpretation. The perceptual experience of the observer is altered according to the meaning assigned to the object in the world. The viewer of the art piece is seeing something in reality that is not necessarily there. This would fall under the definition of a hallucination.

There may be a modular process of bottom up perception as Marr puts forward, and psychological forces and Gestalt principles may be at work in this process, but there is also another level of perception that has to do with the meaning assigned to an object. Elements on the page are regrouped to arrive at this new meaning, and that grouping has its own set of psychological forces that motivate deeper meaning to a piece. This newfound meaning may even motivate another sequence of grouping based upon further reflection of the meaning of the piece, and this cycle will continue until the participant ceases to contemplate the piece at hand. At every stage of this regrouping, the perception of the piece is varied. The physical perception, meaning what is actually seen and comprehended, varies with respect to the degree of meaning associated with the piece. The viewer induces different levels of hallucination based upon the meaning assigned to the piece.

Following this argument would be that claim that experiencing a drug induced hallucination is like interpreting the world as an abstract art piece. As Shanon states, referents in the world are seen as metaphorical, they are not perceived as what is actually there; they are only a suggestion, a guide, a conduit for perception which is based on the meaning assigned to the metaphorical object. Altering certain aspects of the previous theories allows for this to happen. Elements in the world are grouped in a bottom up manner, but this is not where the process ends; it continues based upon the meaning assigned to the scene at hand. This meaning then evokes a second order grouping which alters the perception of the individual, thus creating a subjective perception of things in the world that do not exist objectively for everyone, a phenomena also known as a hallucination.

#### Part Three: A Model of Perception

Embodiment, as defined in the field of Cognitive Science, is the theory that human cognition is largely influenced by how the body interacts with the world. Thought is constrained based upon how the body is able to manipulate physical reality. Followers of the embodiment paradigm hold that cognition is always embodied. Our interaction with the world completely shapes our cognitive patterns, thus no thought may exist outside of the embodied realm. That is not to say that all thoughts have to do with how the body can interact with the world, but the mind has developed in a body, therefore all thoughts have arisen from a mind that can only function in relation to the body and how it can interact with the world. An example of embodied cognition would be looking at a hammer and thinking about the hammer in terms of its function; I can swing the hammer, hold the hammer, and pound with the hammer, all these aspects have to do with how my body can manipulate the hammer.<sup>30</sup>

Ultimately, during a hallucination as well as abstract art viewing, the world is increasingly perceived in terms of meanings arising from an embodied mind. The ven diagram model in Figure 2 models this process.

Objective Reality consists of elements that exist in physical reality that are an agreed upon norm. Mental reality consists of all the workings of the mind. The degree of overlap (embodiment) determines the extent to which the environment will be perceived in terms of the meanings concocted by the mind.

In this model, the amount of overlap can be modulated in two ways. First, it can occur naturally by assigning meaning to the external world. The more meanings assigned, the greater the overlap that occurs. Thus, perception will increasingly become driven by the meanings assigned to an object, as in the case of inter-

preting abstract art. The more meanings are assigned to an art piece results in a perception that is more based upon higher order thinking than lower level processing. As a result of this the actual perception changes; what a person visually sees is a function of the meaning assigned to the scene at hand. This is

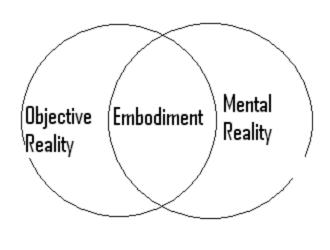


Figure 2

exemplified by attributing a human body to the green form in Figure 1.

The second way this overlap can be modulated is artificially, as in the case of the drug induced hallucination. The two spheres are forced together and as a result the environment is prone to be perceived to a greater extent in terms of the meanings invoked upon it by the mind. Normally, attributed meaning would gradually bring the spheres together; the modulation is a function of meaning attribution. However, if the spheres are forced together one must, according to this model, perceive the world in terms of meanings assigned to objects to a greater extent. One could then ask: Why would drugs force the spheres together? The drugs may force one to perceive the world in a more embodied way, thus forcing the spheres together by an increase in the overlapping space. In summary, natural modulation is a function of assigning meaning, whereas artificial modulation is a function of increased embodiment that then gives rise to perceiving the world in terms of the meanings assigned to it.

> Embodiment has a few features that are pertinent to this discussion. First, cognition is off-loaded onto the environment. This means that humans use the environment as a memory store, allowing for more cognitive capacity for relevant information processing. For example, when giving directions, one will use hand sig-

nals to direct attention, or write information down so it does not have to be remembered. Another aspect is object affordance, which is illustrated in the aforementioned hammer example. Humans think of tools in terms of how they can be used and manipulated. Thirdly, Cognition is situated, meaning that cognition is happening as a result of the current situation humans find themselves in. For example, if one is in a car, one's cognition will have to do with where one is going, how to get there, traffic laws, etc. And finally, cognition is timepressured, meaning that it is happening in real time. For example, drawing on the car scenario again, if a turn is coming up, one cannot pause time and think about whether this is the turn one needs to make; it will happen in real time. This analysis assumes an extreme overlap of mental and objective reality leading to a large embodiment space as illustrated in Figure 3 on the following page.

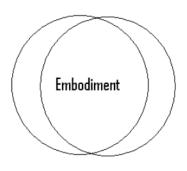


Figure 3: The spheres have been artificially combined using the drug, thus leading to a greater level of embodiment.

The issue of identity with the Ayahuasca drinkers can be reconciled with this model. A thought experiment that takes the normal features of embodiment and hypothesizes what these aspects would look like in an extreme case may lead to an understanding of what is going on during the hallucination. Identifying oneself as the object of inspection may be an extension of object affordance and off loading cognition onto the environment. This situation is an exaggerated sense of object affordance because the object is not only understood in ways that the body can manipulate it, but it is taken a few steps further and considered an actual extension of the body. This situation also exemplifies an amplified version of off-loading cognition onto the environment because the drinker's mental processes are completely transferred to the object. Normally, this component of embodied cognition would be used to aid in memory and cognitive load by using the environment as a reminder of sorts.

This model also gives insight into the lack of differentiation between the psychological states of drinkers. In this situation, one is not able to tell if one is thinking or imagining, thinking or perceiving, or thinking or viewing the thoughts of other people. When these circles are artificially combined, the mental reality is transposed upon the objective reality, leading to a progressive representation of mental reality as objective reality. The perceived world may be constituted of thought processes, imaginings, or actual objectively defined events. This distinction is blurred as one progressively comprehends the world in a more embodied way. Normally, the two spheres are at a regulated distance from each other and the mind is able to tell that the meaning it is attributing to the world comes from itself and the resulting perception is influenced by thought processes, but when the circles overlap in an extreme sense, this distinction is no longer possible; objective reality is intermixed with mental reality. Again, this could be a result of fully offloading cognition onto the environment.

The loss of the sense of self may be explained with this model as well. For the sake of discussion, let us term the normal overlap between the two spheres as an arbitrary value of thirty percent embodied cognition. In the hallucination, maybe 80% of cognition is embodied (reserving 100% embodied for a different purpose to be expounded upon later). The sense of self associated with each of these states - 30% and 80% embodiedwould be radically different. While perceiving the world from a consciousness that is 80% embodied the mental workings constitute practically all of reality; cognition is 80% off loaded onto the environment. That is, the self is constituted of 20% mental workings and 80% existing as the environment. This is not a normal state of being, and one may not be able to maintain a sense of self during this radical transformation. It is as if one has become a different entity that is able to perceive the world in a much different manner. This would explain why novice drinkers, and not experienced drinkers, often report a sense of complete loss of self. The experienced drinker may be more familiar with the eighty percent embodied state and realize that, 'Yes-this is me in this reality still, but with much altered surroundings; I have experienced this before and recognize this state.' Whereas the novice would have nothing to compare this experience to, leading him to believe that he no longer exists as the same individual.

Drinkers often report a sense of connection to a kind of super consciousness. They feel as if all things are connected in some intricate way and every part of reality has an important purpose. This would follow from understanding objective reality in terms of mental reality. All things would be considered connected through the mind of the perceiver because all the referents in the world would be a product of the mental reality. This is because the mental reality sphere is almost completely overlapped with the objective reality sphere. Thus, all of objective reality is seen as constitutive of the workings of the mind. There would be an inherent connection of things if one is generating all the images in a scene. The super consciousness would then be defined as a progressive embodiment of the universe. As the spheres are pushed together, the totality of objective reality is being merged with the mental reality, creating one reality that is constituted of the workings of an individual mind. This can be likened to the reports of nirvana reached in a deep state of meditation. Meditation would then be a natural means of merging the two spheres of reality.

Monks and other people who meditate often recount feelings of a connectedness to all beings and a sense of cosmic consciousness of which they are a part.31,32 This would stem from a progressive embodiment of the environment. The constituent parts of the universe are defined to be a part of the self through this process. The external world is redefined, thus merging the two spheres, leading to progressively perceiving the universe in terms of one's own body; in this scenario one would be identifying self as the universe. This case is not so unlike the identification of the self with the hammer, but the object of identification is much larger and more abstract, yielding a larger percent of embodiment. This nirvanic experience is what I reserved the 100% embodiment condition for. Therefore, enlightenment would be defined as completely existing as the universe; there is no separation between objective reality and mental reality. One exists in a state of complete embodiment with the universe.

Another aspect that bridges the artificial versus natural merge of the spheres is the domain of interpreting referents in the world to mean something different. Ayahuasca drinkers report the feeling that things in the world are actually metaphors for a deeper structure. They can then employ a meaning of their choosing onto the object, thus impacting their perception of the object. This meaning assignment is a direct example of understanding objective reality in terms of mental reality. The object in the world is interpreted to mean something different and is therefore perceived as a different object. The same was said about viewing abstract art earlier in the discussion. Each of the constituent parts were grouped and regrouped based upon higher order operations therefore leading to a different perceptual experience of the art piece. This is the common grounds between art and hallucination.

It would seem that psychological forces and Gestalt grouping could happen on a low level as suggested in Marr's model, but there is also a higher order counterpart that drives perception in an equally important way. This higher order counterpart is what increases the level of overlap between the two spheres. Assigning meaning to objects in the world makes one increasingly understand objective reality in terms of one's mental reality, thus increasing the amount that cognition is embodied. In viewing art, the percent of embodiment may vary minimally from 30% to 35%33, depending on the amount of meanings assigned to a piece. Thus, the perception of the piece alters according to this because the amount that cognition is embodied dictates the extent to which one's mental processes are represented in the perception of the piece. If the embodiment rate is high, like in a hallucination, one will assign meaning to elements in an artwork, and it will transform completely based upon these assignments. If the rate is normal, then perception of the piece will change but not so drastically as to create a movie scene or something to that effect.

The three theories put forth by the Marr, Arnheim, and Gestalt Psychologists serve to create a situation of normal overlap between objective reality and mental reality. Interpretation uses a second order gestalt grouping that is influenced by a new set of psychological forces on a higher order that stem from assigning meaning to a piece. Each meaning assigned to the piece lets one perceive the objective world increasingly in terms of mental reality. Thus, the embodiment overlap increases and one is able to increasingly identify the self with the object in the world. In extreme cases, such as in the Ayahuasca hallucination, the person will not be able to differentiate self from the abstract art piece and this is an example of extreme off loading of cognition onto the environment to such an extent that there is no separation between self and environment. This can lead to a loss of self as evidenced in the Ayahuasca reports, but as a person becomes familiar with this state of embodiment one is able to recognize a sliver of self and maintain a coherent identity throughout the hallucination.

To summarize, altering the overlap between the objective reality sphere and the mental reality sphere constitutes altering one's state of consciousness. In these different states of consciousness one perceives things in the world differently than one would in a normal state of consciousness. These differences in perception can be rectified by looking at the features of embodiment and performing a thought experiment on how they would manifest themselves in an extreme case. These two spheres may be modulated artificially, by drugs, or naturally by meditation, viewing abstract art, creativity, reading, and any other activity that requires one to attribute meaning to an object in the world.

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2 - Ibid. pg. 15

3 - Ibid.

4 - Riba, Jordi et. al., "Effects of ayahuasca on sensory and sensorimotor gating in humans as measured by P50 suppression and prepulse inhibition of the startle reflex, respectively," Psychopharmacology 165: 18-28 (2002), http:// www.springerlink.com/content/kl8tmq4u0r78ymjj/fulltext.pdf

5 - Shanon, Antipodes. pg. 199

6 - Ibid. pg. 200

7 - Ibid. pg. 242

8 - Ibid. pg. 243

9 - Ibid.

10 - Ibid. pg. 253

11 - Ibid.

12 - Ibid. pg.207

13 - Ibid.

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16 - Ward, Jamie. (2006). The Student's Guide to Cognitive Neuroscience. NY:Psychology Press. Pg. 325

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19 - Ibid.

20 - Itti, Laurent, "Models of Bottom-Up and Top-Down Visual Processes" California Institute of Technology Doctoral Thesis (2000), http://etd.caltech.edu/etd/available/etd-12022005-103530/unrestricted/Itti\_1\_2000.pdf

21 - Ibid.

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26 - Ibid.

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28 - Ibid.

29 - Arnheim, R. (1974). Art and Visual Perception: A Psychology of the Creative Eye: University of California Press.

30 - Embodied Material: Clark, A. (1997). Being There: Putting Brain, Body, and World Together Again. Cambridge, MA: The MIT Press.

31 - "When a person (no matter who) learns to focus and concentrate on SPIRIT, their Mind will gather from their Cosmic Consciousness, the deepest secrets of the Universe, as to how it is composed, by what means, and to what end." http:// www.pymander.com/AETHEREAL/COSMIC~1.htm

32 - "Advanced yogis experience Cosmic Consciousness, Cosmic Vision. This is a rare experience. It is like a glimpse in the beginning. .. You will feel that the world is nothing but pure Consciousness...During deep meditation, the aspirant forgets the external world and then the body. You will not hear any sound. The consciousness of egoism will gradually vanish." http://www.divinelifesociety.org/graphics/sadhana/ meditation/experience\_in\_meditation.html

33 - The 30% normal range was created as an arbitrary reference point to explore the possible outcomes of modulating the embodiment percentage.

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