



beōnd

**Ibogaine Science:**

How Ibogaine Works in the Brain to Treat Substance Use Disorder

Dr. Joseph Peter Barsuglia - Advisor to Beōnd  
+ Crossroads Treatment Center, Mission Within, VETS, Sōhei, Journey Colab, Woven Science

May 11, 2022

[www.josephbarsuglia.com](http://www.josephbarsuglia.com)

# Ibogaine - Bwiti Ancient Indigenous Tech

"Iboga" derives from the word "boghaga" which means "to take care of"

Purification - ritual bathing and purgatives  
confess short comings

Spiritual experience  
to connect with spirit, nature, soul, ancestors

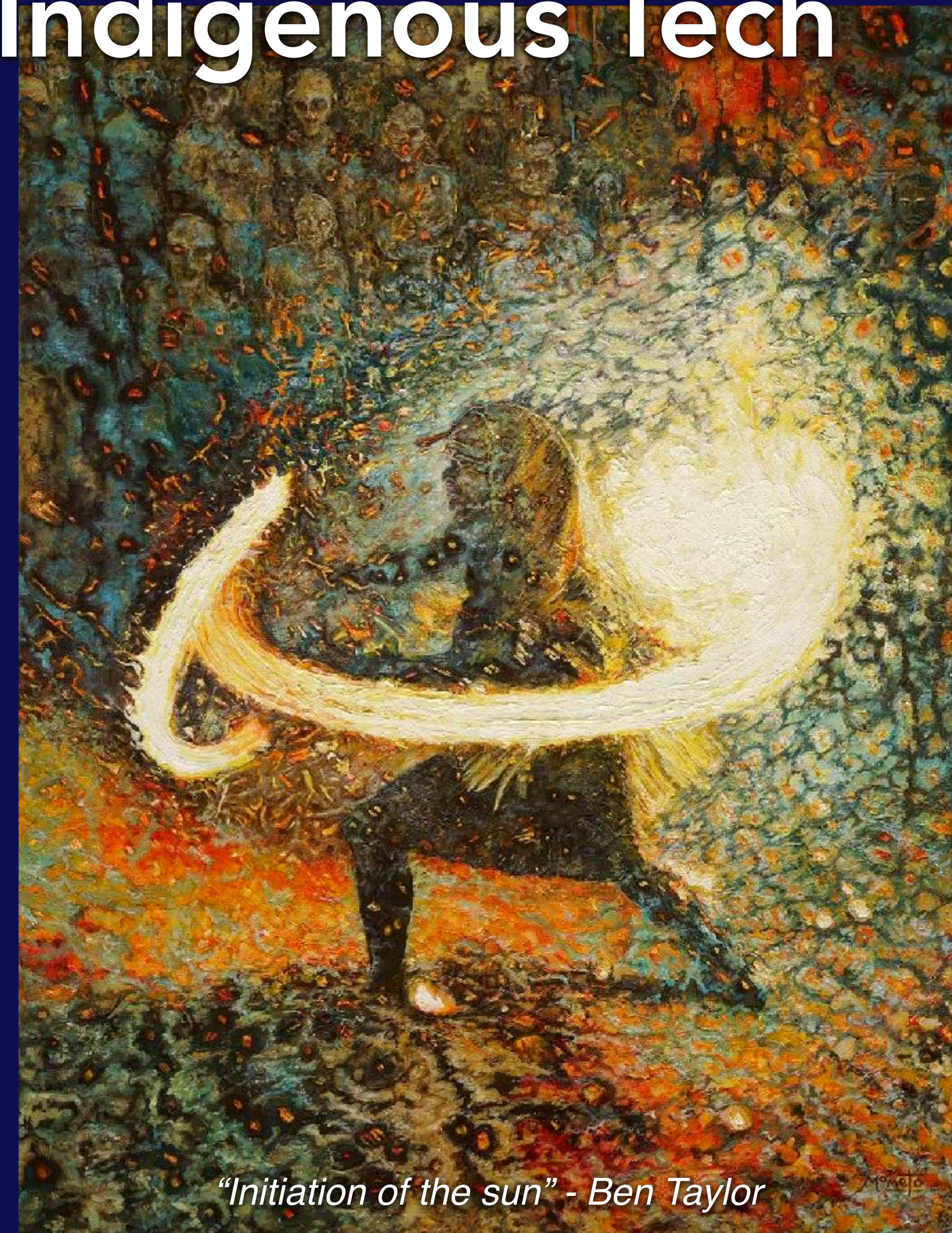
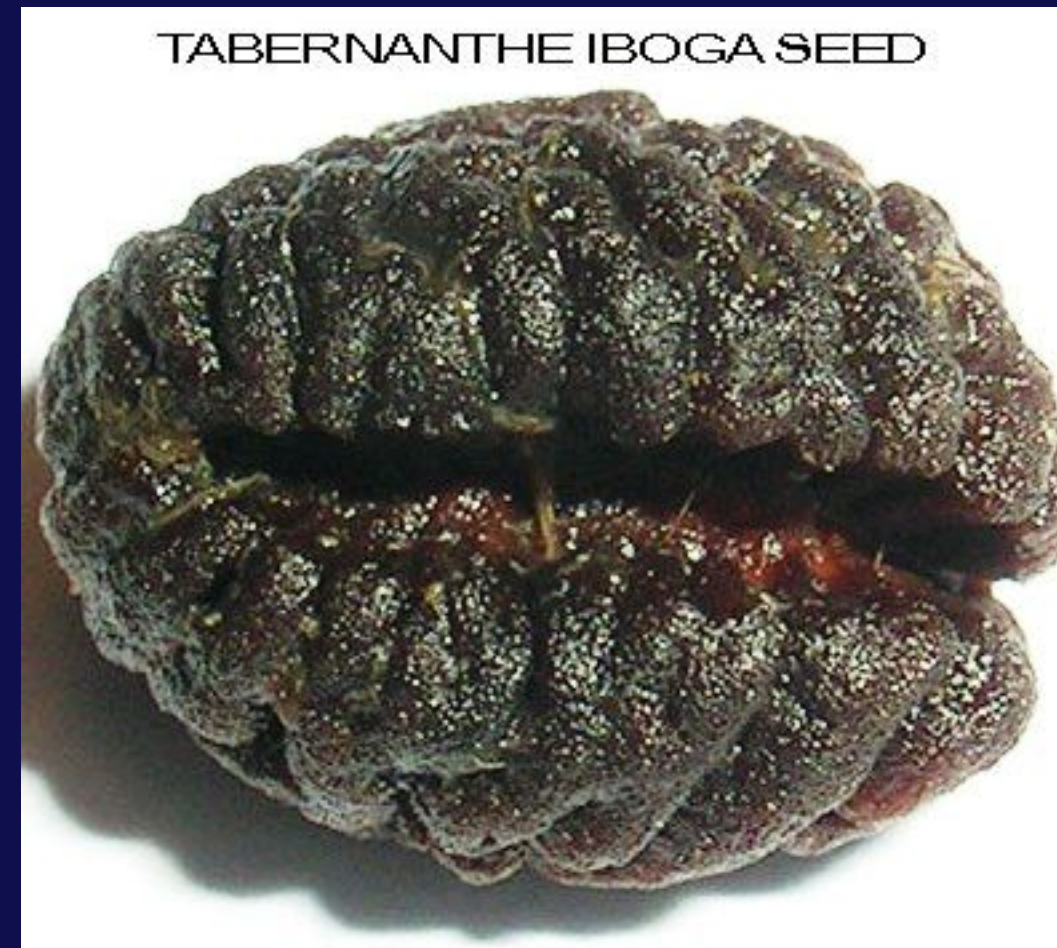
A death & rebirth

Initiatic doses - dawn of creation,  
and cosmic, collective, and personal memory

Sacrament understood as "God's spirit"

Dancing on iboga —> bridging spirit + body

Collective - uniting community to be One Heart



*"Initiation of the sun" - Ben Taylor*

# Core Diagnostic Facets of Substance Use Disorder

DEPENDENCE  
CRAVING  
TOLERANCE  
WITHDRAWAL

IMPAIRED  
CONTROL

## Criteria for Substance Abuse Disorders



Cravings to use  
the substance



Wanting to cut  
down or stop but  
not managing to



Taking the substance in  
larger amounts or for longer  
than you're meant to



Neglecting other parts  
of your life because of  
substance use



Continuing to use,  
even when it causes  
problems in relationships



Using substances even  
when it puts you in  
danger

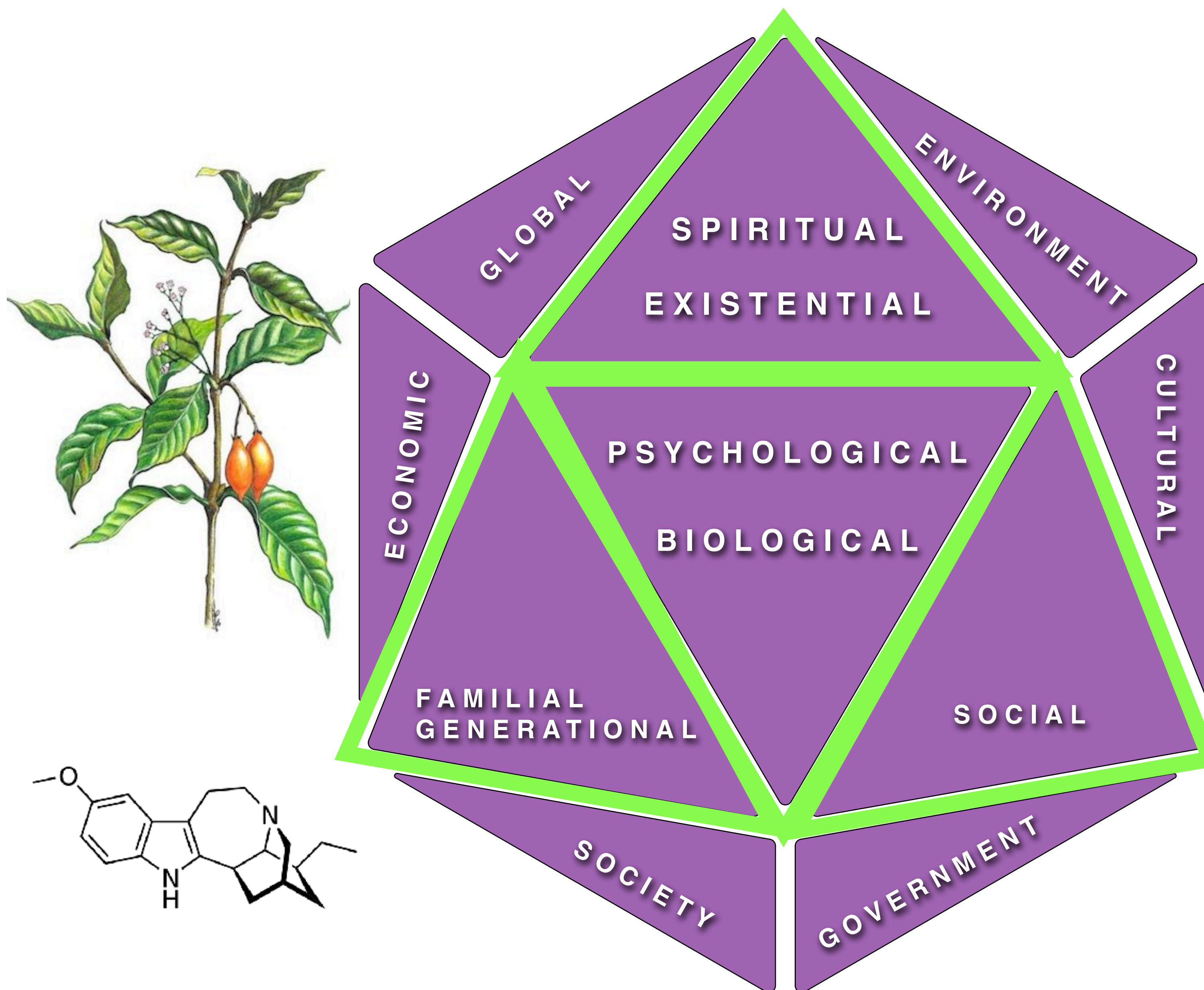
SOCIAL  
PROBLEMS

RISKY USE



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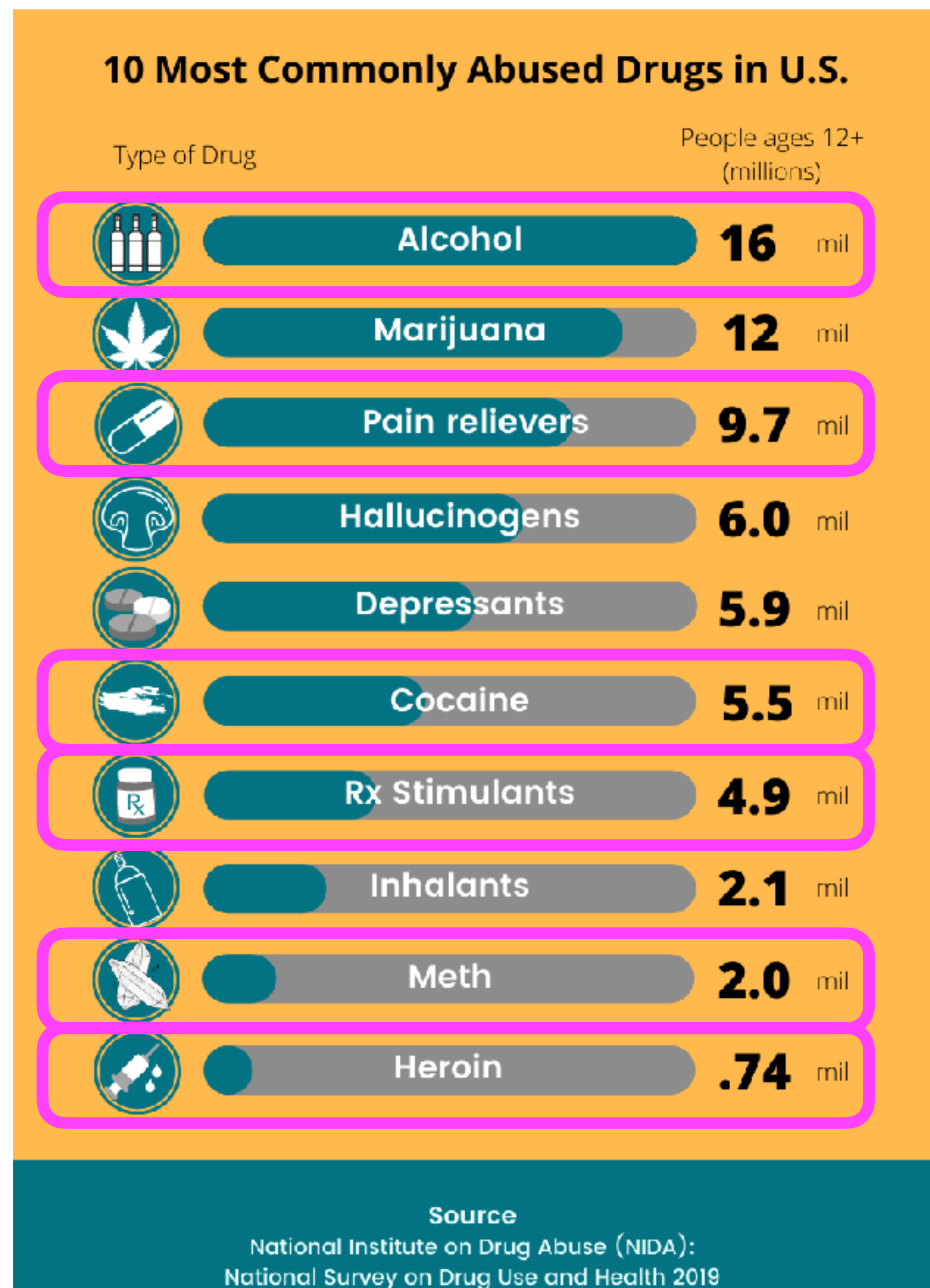
# Holistic View of Addiction





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# Anti-Addictive Effects of Ibogaine By Substance



## IBOGAINE HAS ANTI-ADDICTIVE EFFECTS WITH:

Alcohol

Opioids / Heroin

Cocaine

Amphetamines

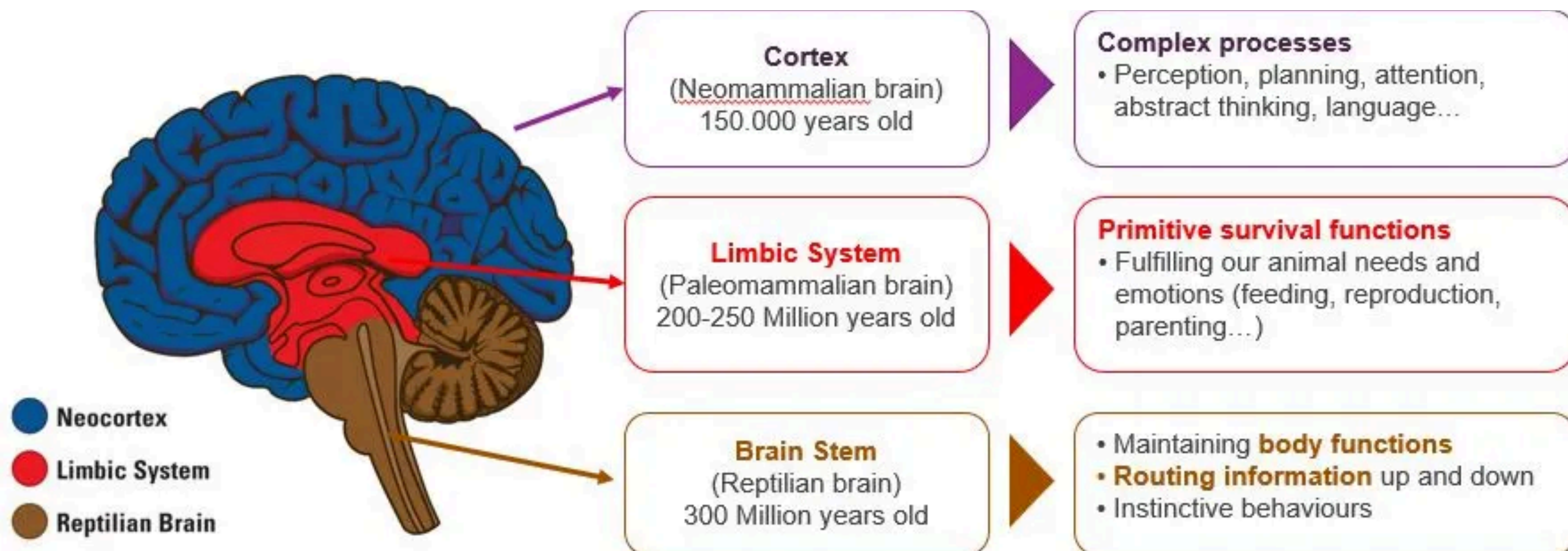
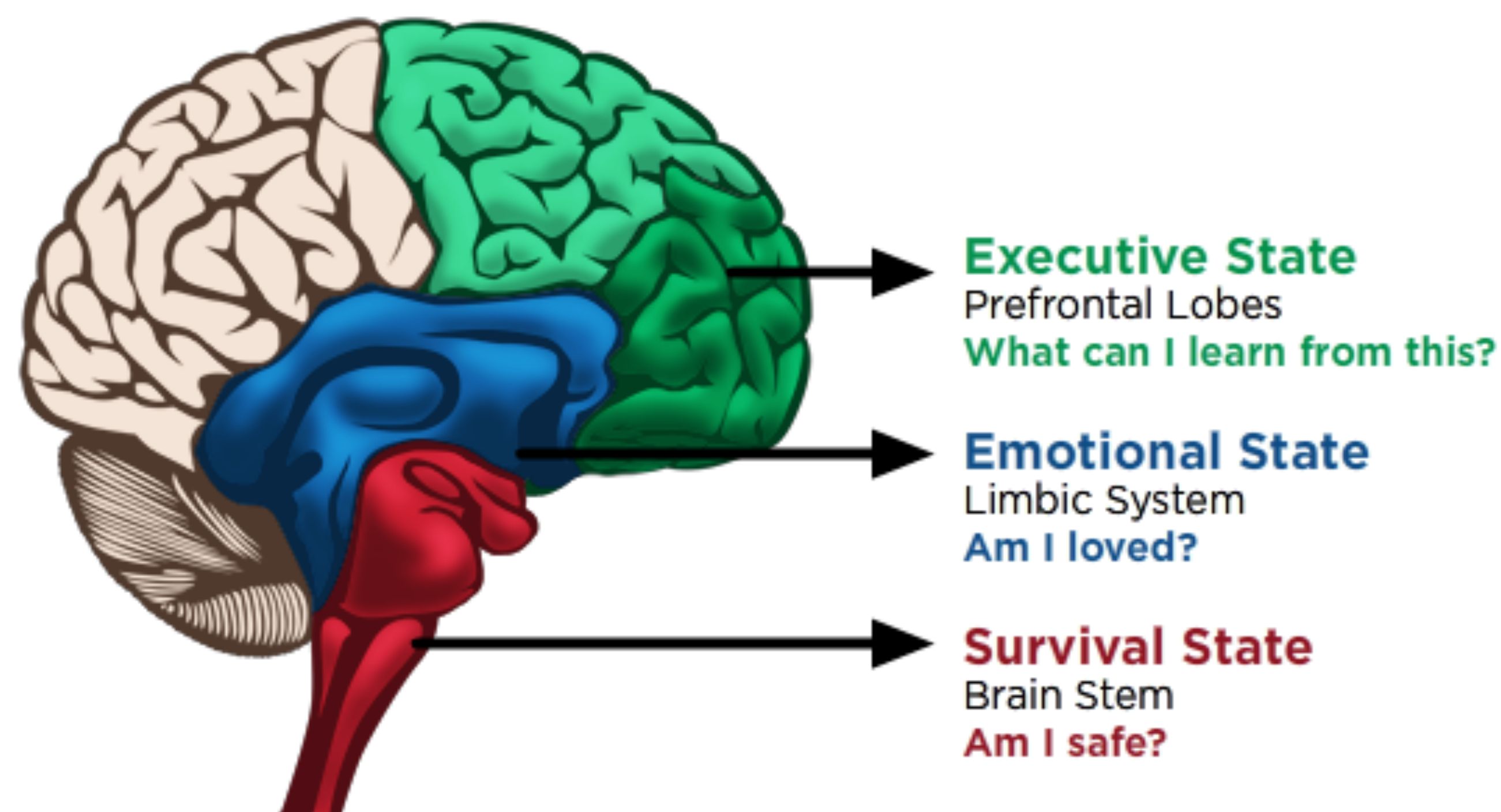
Nicotine

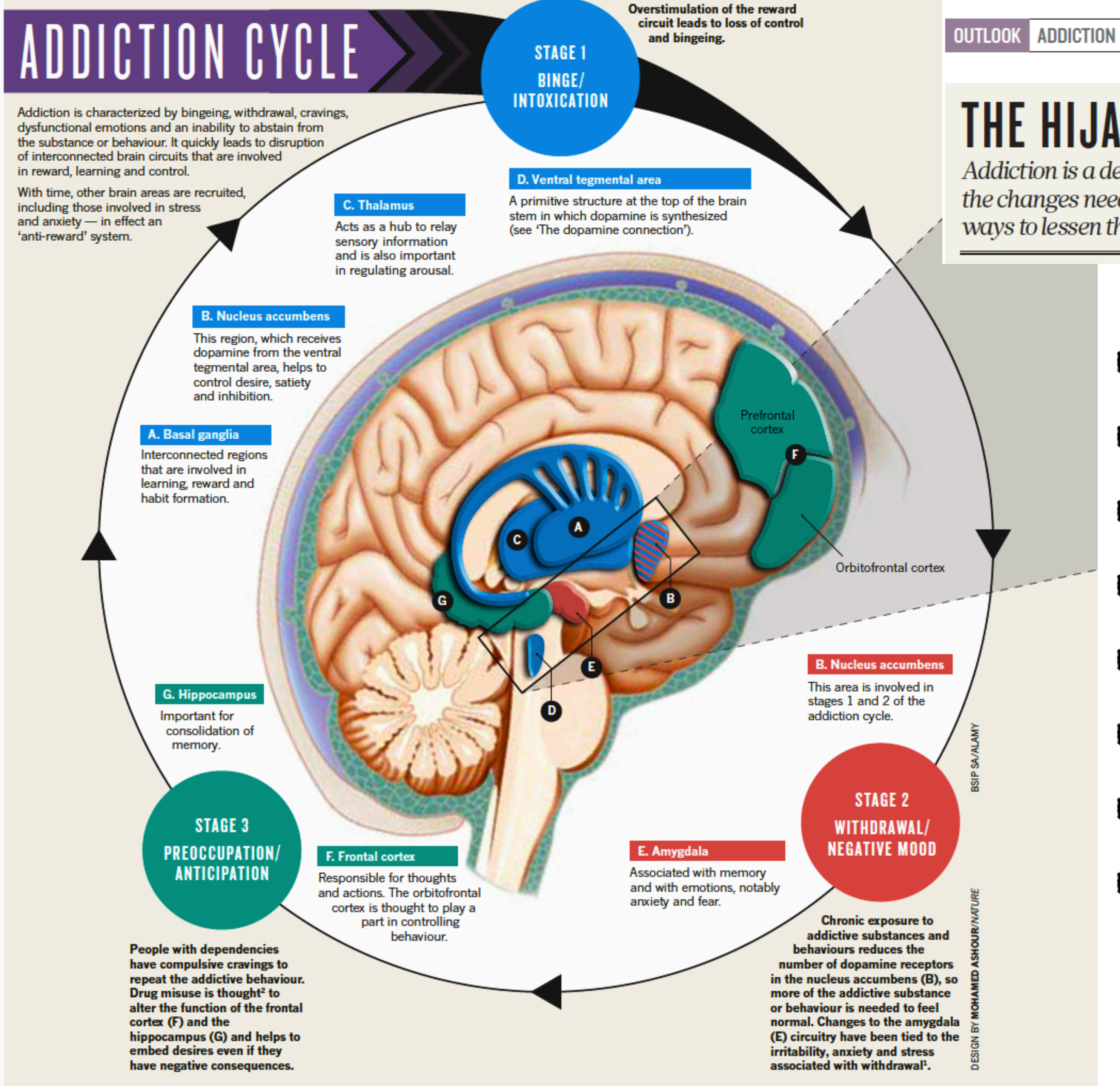
Sweet Preferences (Food)



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# TRIUNE BRAIN THEORY





- ✓ 'Addiction' from the Latin *addicere* - Means 'to enslave'
- ✓ Substance Craving
- ✓ Conditioned Responses to Drug Cues
- ✓ Utilization of substances to avoid painful feelings
- ✓ Compulsive behavior
- ✓ Substances use gets over learned as a survival pattern
- ✓ Downregulation/reduction of dopamine receptors
- ✓ Reward- pleasure signaling - need substance to feel normal



# Psychopharmacological Pathways of Ibogaine & Anti-Addictive Effects

PRIMARY PHARMACOLOGICAL PATHWAYS	EFFECTS IN ADDICTION
Mu and Kappa Opioid Receptors	<ul style="list-style-type: none"><li>✓ Ibogaine mitigates opioid withdrawal and craving through novel mechanism</li><li>✓ <math>\mu</math>-Opioid receptor regulates pleasure/reward and reinforcing effects with drugs of abuse</li></ul>
N-methyl-D-aspartate (NMDA) Antagonist	<ul style="list-style-type: none"><li>✓ Reduces opioid + stimulant withdrawal and craving</li><li>✓ Unlearning of habits that persist even in the face of negative consequences - associated with drug cues</li><li>✓ Regulates Ventral Tegmental Area</li></ul>
Dopamine (DAT) and Serotonin Transporters (SERT)	<ul style="list-style-type: none"><li>✓ Mood boosting/regulating properties</li><li>✓ Maladaptive alterations in SERT = greater susceptibility to the rewarding properties of drugs of abuse</li><li>✓ Ibogaine's effect on psychological dependence (craving) attributed to long-acting effects on DAT and SERT</li></ul>
Nicotinic Acetylcholine Antagonist (nAChR $\alpha 3\beta 4$ and $\alpha 2\beta 4$ )	<ul style="list-style-type: none"><li>✓ Regulates signaling in mesolimbic addiction pathways mediate reinforced behavior</li><li>✓ High density in the Ventral Tegmental Area</li><li>✓ High density in sensory regions - Visual Cortex</li></ul>
Sigma ( $\sigma$ ) receptors ( $\sigma_2 > \sigma_1$ )	<ul style="list-style-type: none"><li>✓ Associated with drug sensitization + reward and reinforcement (i.e. alcohol and cocaine)</li><li>✓ Target of interest in ameliorating depression and anxiety</li><li>✓ Neuroprotective and cognitive enhancing</li></ul>
Substance P	<ul style="list-style-type: none"><li>✓ Neuropeptide, implicated in stress-resilience and pain tolerance, inhibits opioid tolerance</li></ul>



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# "The Magic Sauce" & Regenerative Properties of Ibogaine

Neurotrophic Factors are proteins that promote the growth, differentiation, synaptogenesis, and survival of neurons. They modulate maintenance, protection, repair and plasticity of the nervous tissue. The "Miracle-Gro" for the brain

Ibogaine boosts Neurotrophic Factors such as:

1. \*\*GDNF (Glial Derived Neurotrophic Factor)
2. BDNF (Brain Derived Neurotrophic Factor)
3. NGF (Nerve Growth Factors)

Explains the long-lasting effects of ibogaine:

- Reverse adaptations to chronic exposure to drugs of abuse in the reward system
- Suppresses and inhibits drug seeking behavior

Ventral Tegmental Area & Nucleus Accumbens:

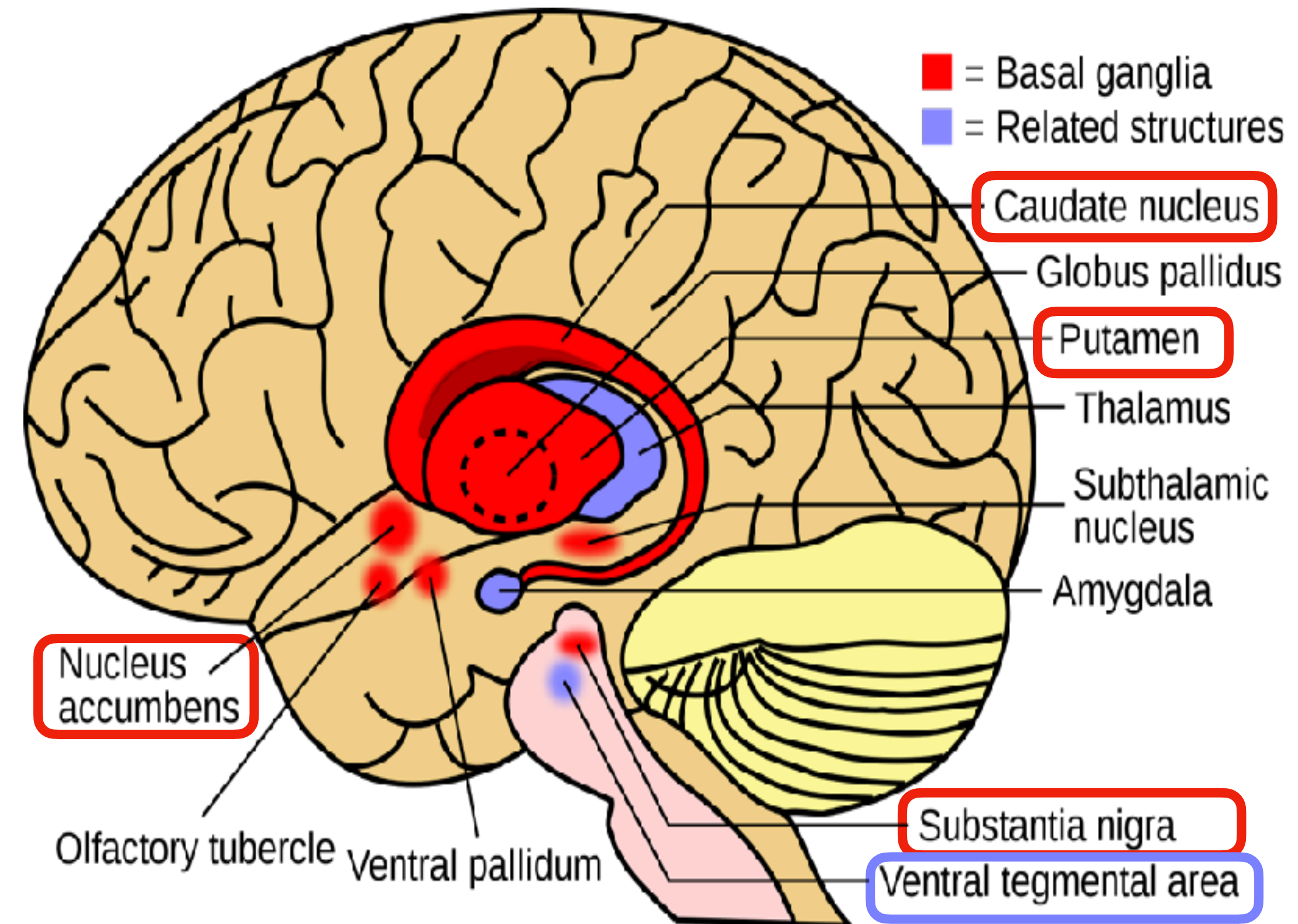
Primary sites where most addictive drugs act.

Alterations in dopamine and reward processing from repeated stimulation

All drugs of abuse activate mesolimbic neurons in the Ventral Tegmental Area

Substantia Nigra

Involved in addiction cues and relapse





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## Ventral Tegmental Area & Nucleus Accumbens:

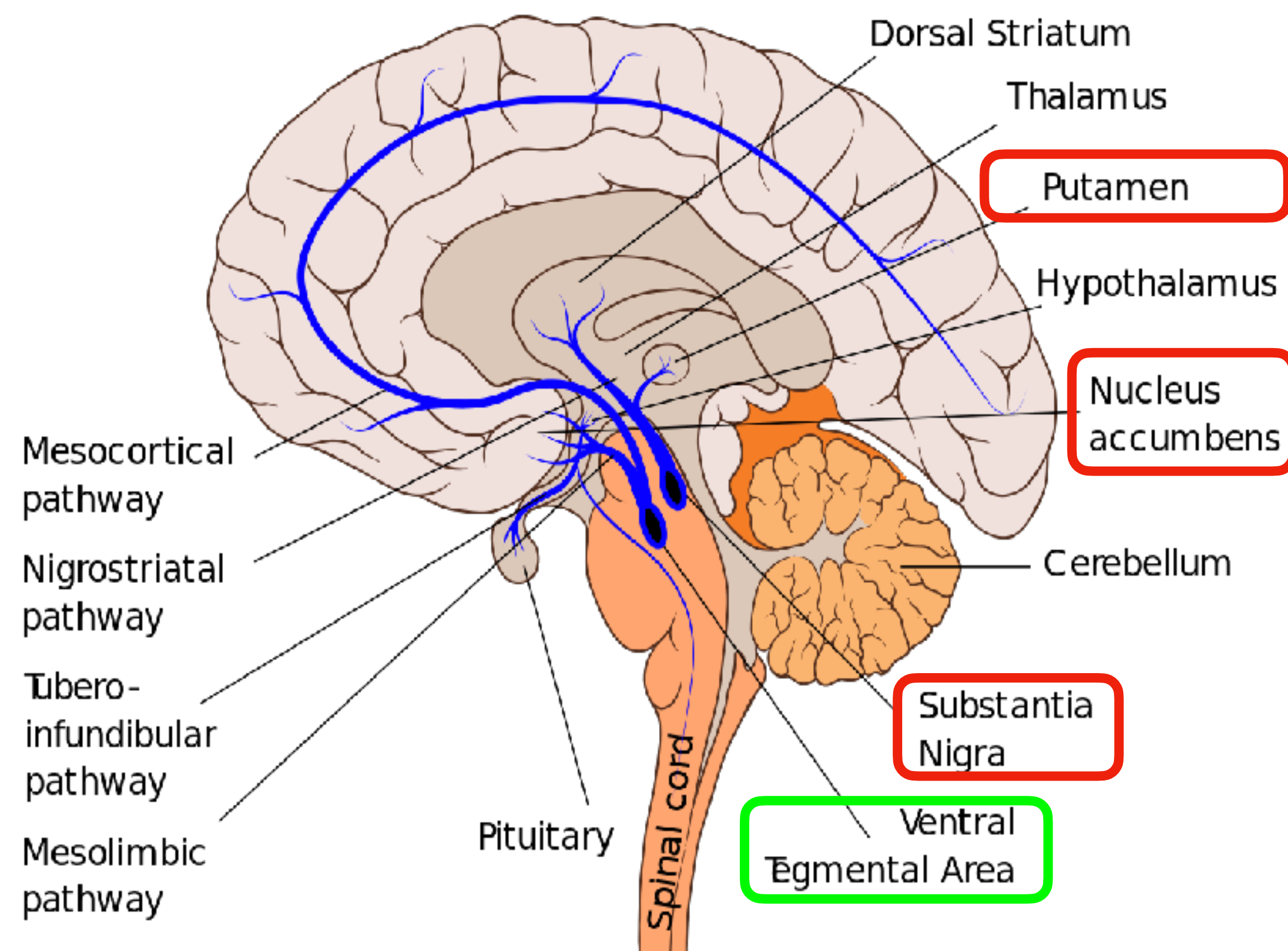
Primary sites where most addictive drugs act.

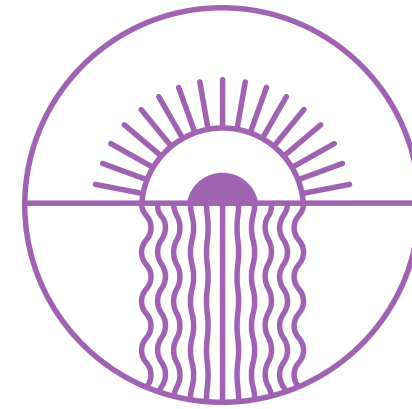
Alterations in dopamine and reward processing from repeated stimulation

All drugs of abuse activate mesolimbic neurons in the Ventral Tegmental Area

## Substantia Nigra

Involved in addiction cues and relapse





*"Suddenly, I realized that I was not in heroin withdrawal,"  
Howard Lotsof later said of his own ibogaine experience.  
Nor did he crave it.*

*"Where previously I had viewed heroin as a drug which gave me comfort,  
I now viewed heroin as a drug which emulated death.  
The very next thought into my mind was, I prefer life to death."*

*TIME Magazine - Inside Ibogaine, One of the Most Promising and Perilous Psychedelics for Addiction*



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Journal of Psychoactive Drugs

ISSN: 0279-1072 (Print) 2159-9777 (Online) Journal homepage: <http://www.tandfonline.com/loi/ujpd20>



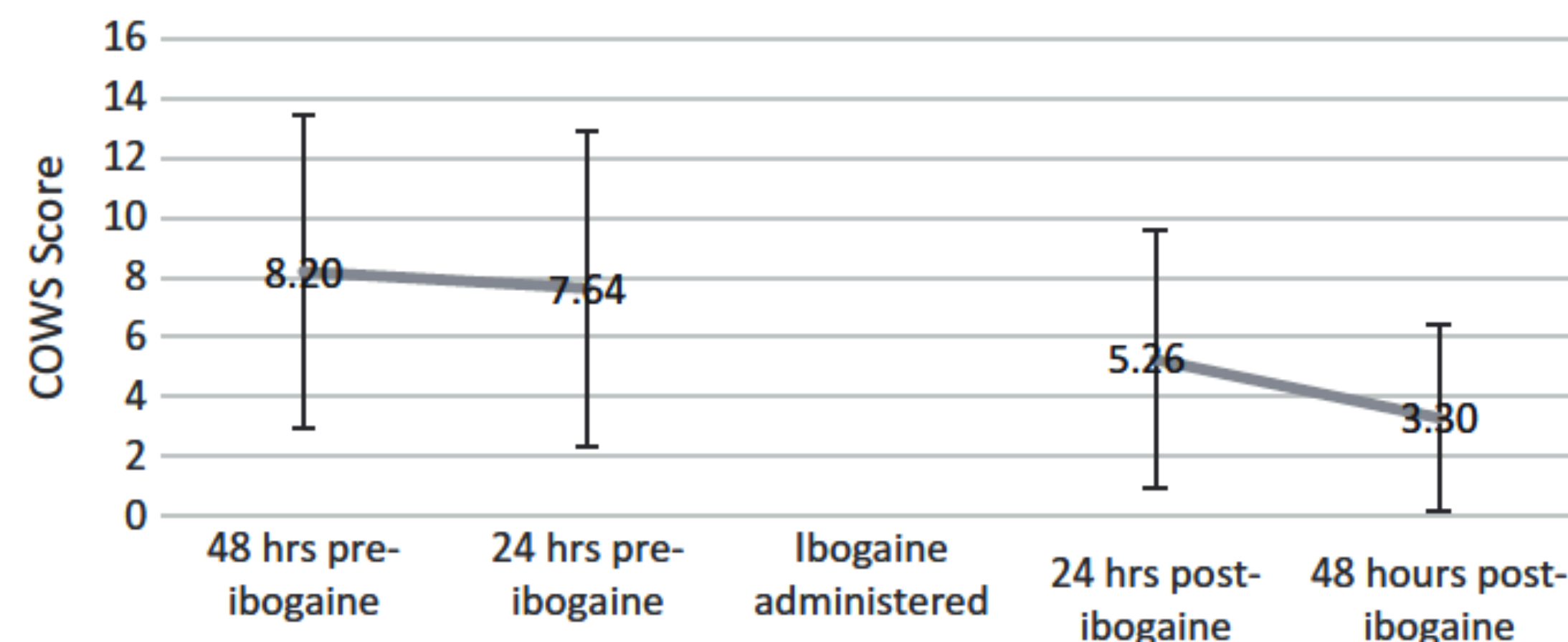
## Changes in Withdrawal and Craving Scores in Participants Undergoing Opioid Detoxification Utilizing Ibogaine

Benjamin J. Malcolm, Martin Polanco & Joseph P. Barsuglia

To cite this article: Benjamin J. Malcolm, Martin Polanco & Joseph P. Barsuglia (2018): Changes in Withdrawal and Craving Scores in Participants Undergoing Opioid Detoxification Utilizing Ibogaine, Journal of Psychoactive Drugs, DOI: [10.1080/02791072.2018.1447175](https://doi.org/10.1080/02791072.2018.1447175)

To link to this article: <https://doi.org/10.1080/02791072.2018.1447175>

### A) COWS Scores over Time $\pm$ S.D. (n=50)



### C) BSCS Scores over Time $\pm$ S.D. (n=48)

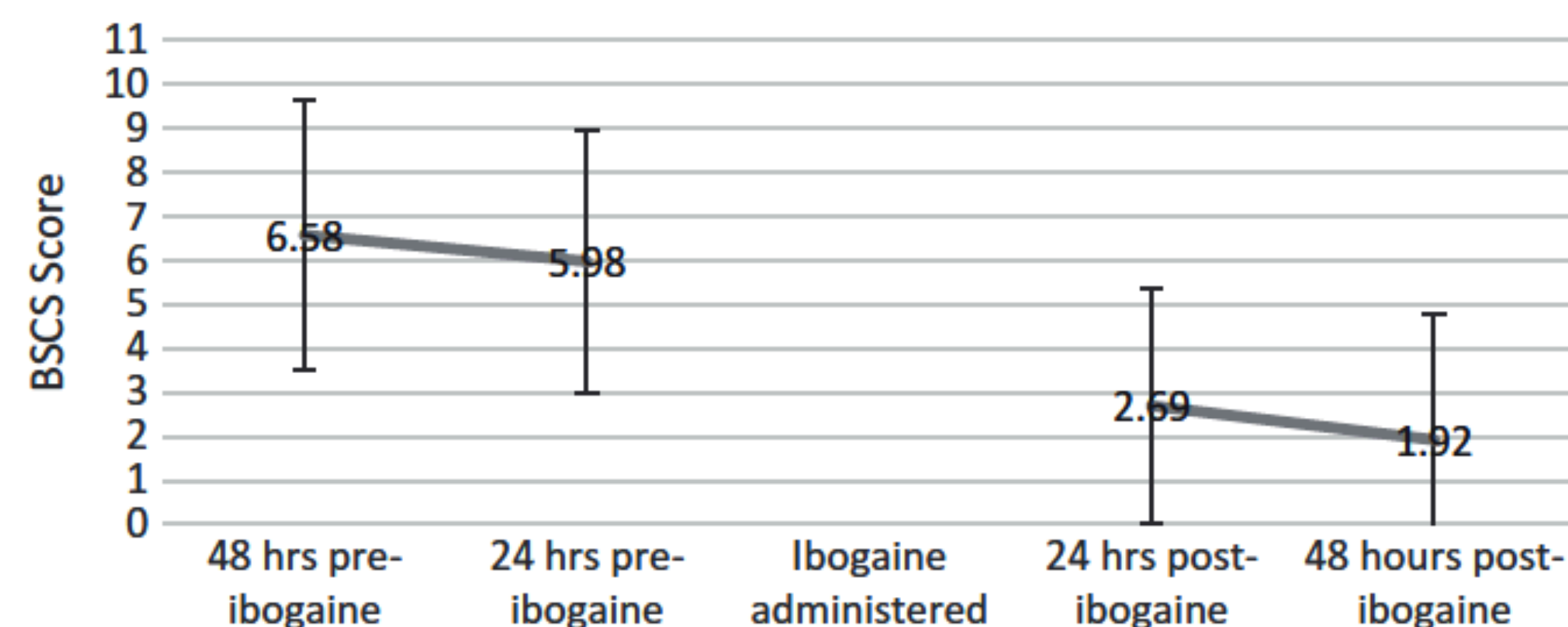


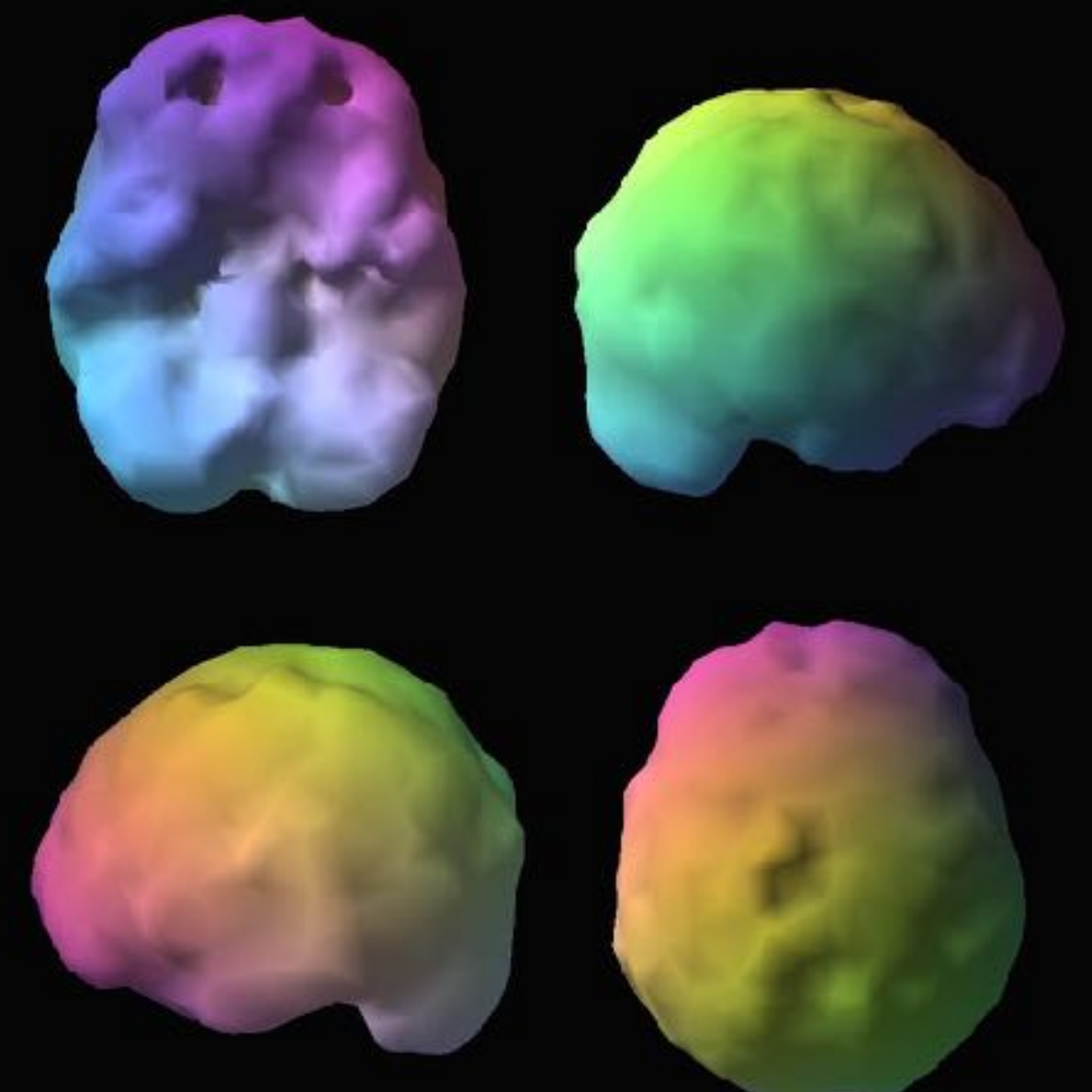
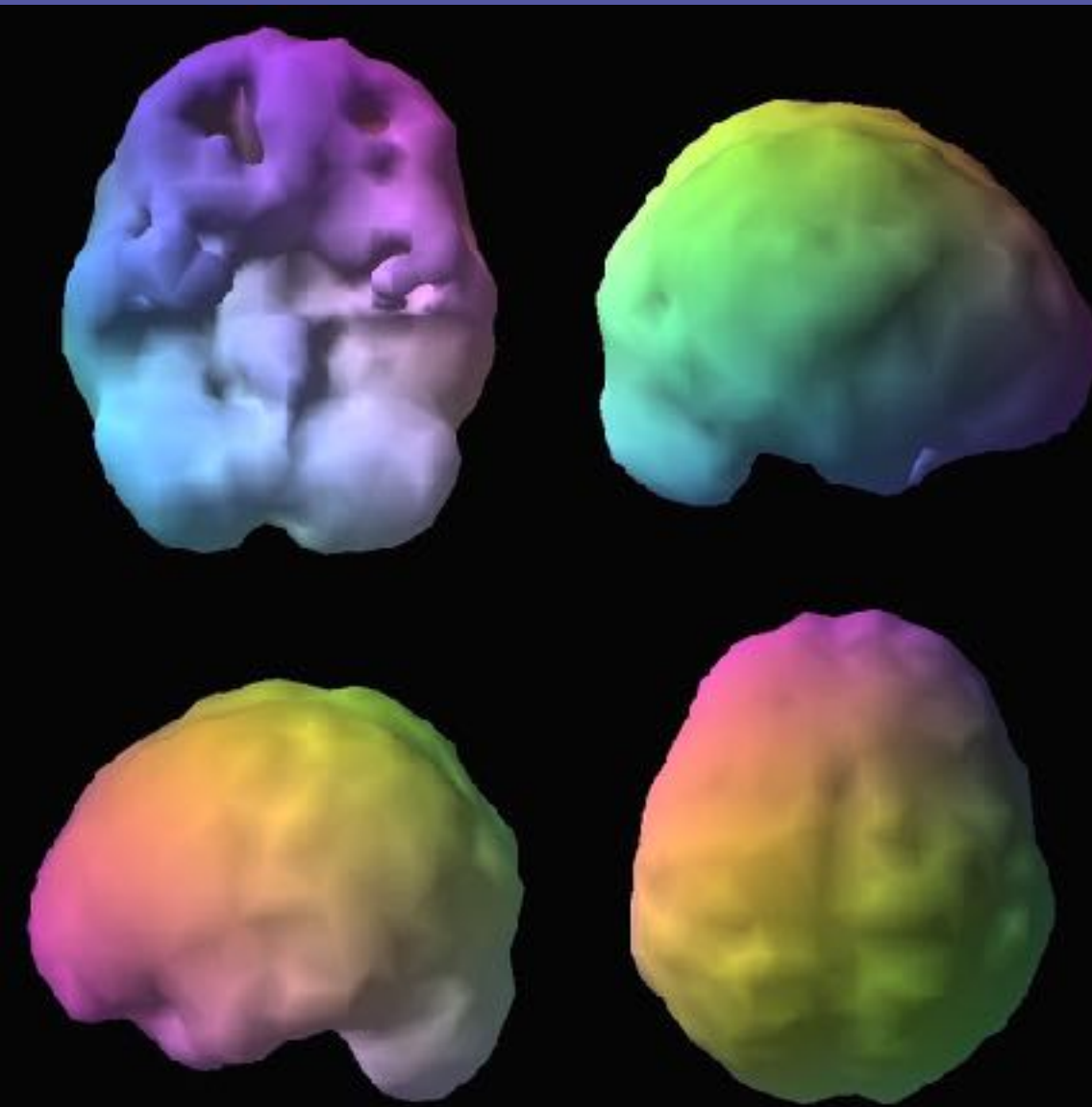
Figure 1. Opioid withdrawal and craving scores in subjects receiving ibogaine for opioid detoxification.

A case report SPECT study  
and theoretical rationale  
for the sequential  
administration of ibogaine  
and 5-MeO-DMT in the  
treatment of alcohol use  
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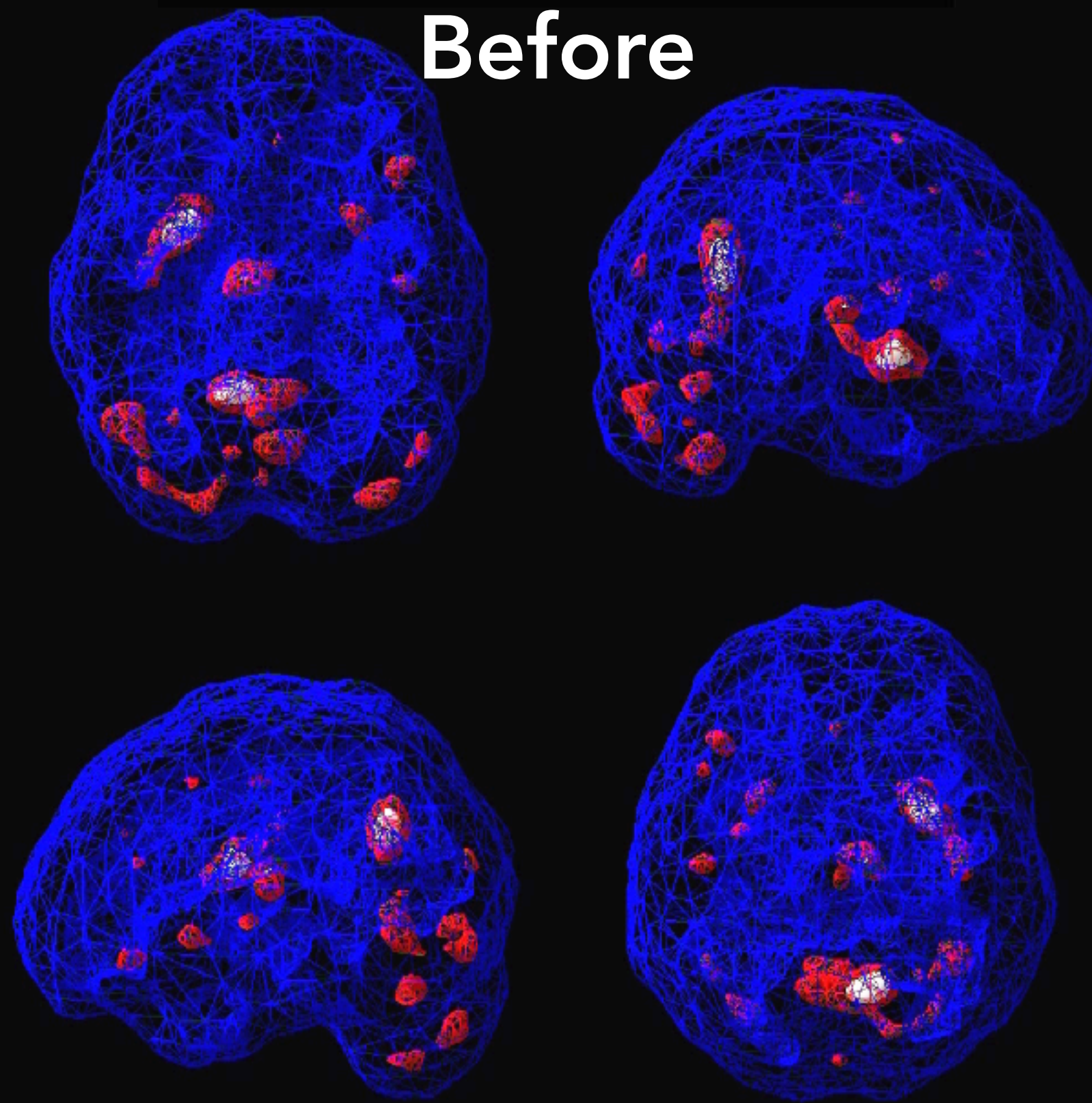
Joseph P. Barsuglia<sup>\*,†,§,¶</sup>, Martin Polanco<sup>\*,†</sup>, Robert Palmer<sup>¶</sup>,  
Benjamin J. Malcolm<sup>¶</sup>, Benjamin Kelmendi<sup>#</sup>, Tanya Calvey<sup>\*\*</sup>

2 days Before  
5 days Post Ibogaine

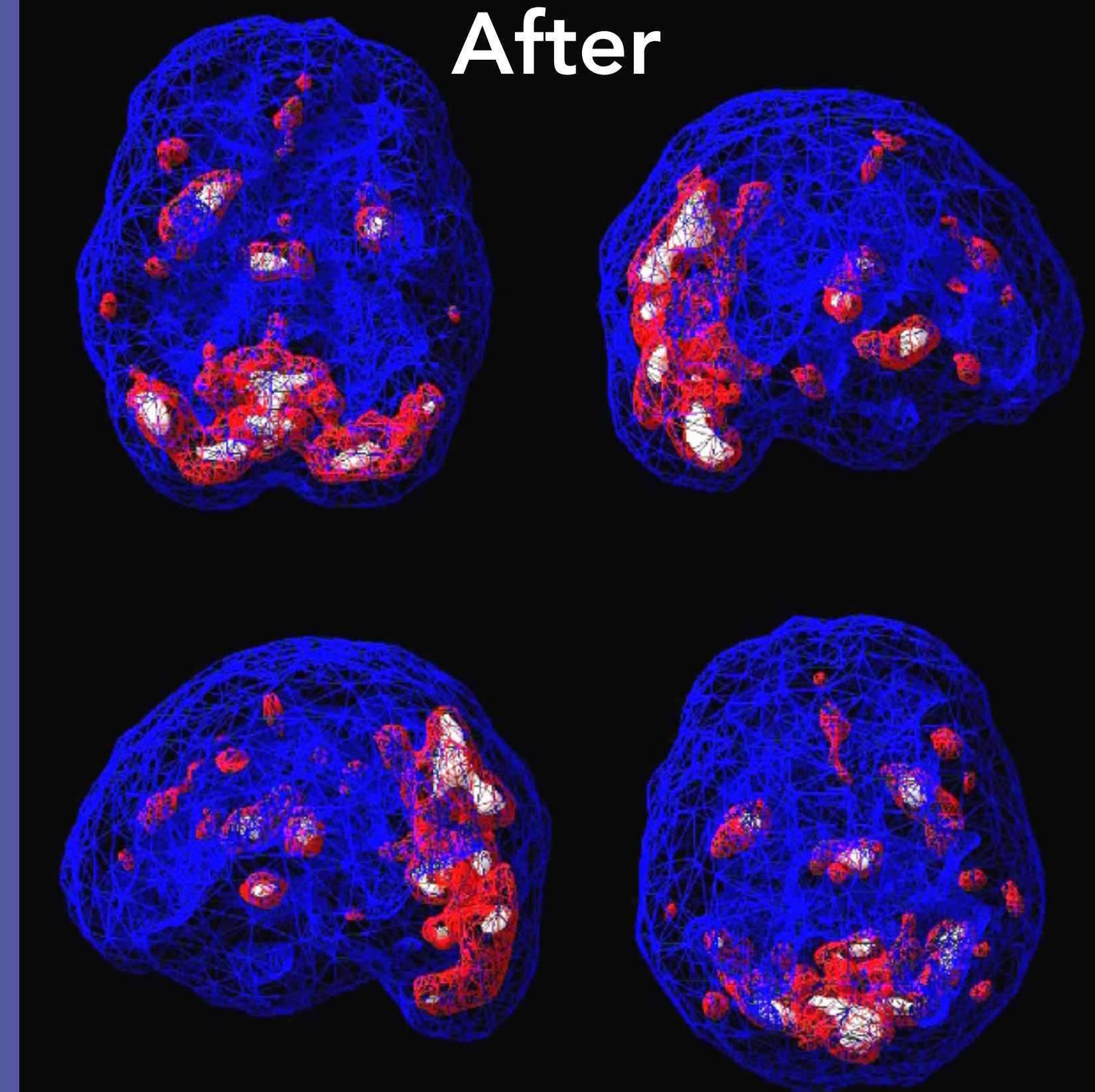
*From Mission Within Veteran Program  
Crossroads Treatment Center - 2016*



Before



After



A case report SPECT study and theoretical rationale for the sequential administration of ibogaine and 5-MeO-DMT in the treatment of alcohol use disorder

Joseph P. Barsuglia<sup>\*,†,§,¶</sup>, Martin Polanco<sup>\*,†</sup>, Robert Palmer<sup>¶</sup>, Benjamin J. Malcolm<sup>||</sup>, Benjamin Kelmendi<sup>#</sup>, Tanya Calvey<sup>\*\*</sup>

**Table 2** Changes in Visual Ratings of Perfusion in Regions of Interest Between Baseline and Posttreatment





# BASAL GANGLIA & FUNCTIONING IN ADDICTION

Implication of basal ganglia in addiction

Underlies responses to reward (and addiction) + habit formation

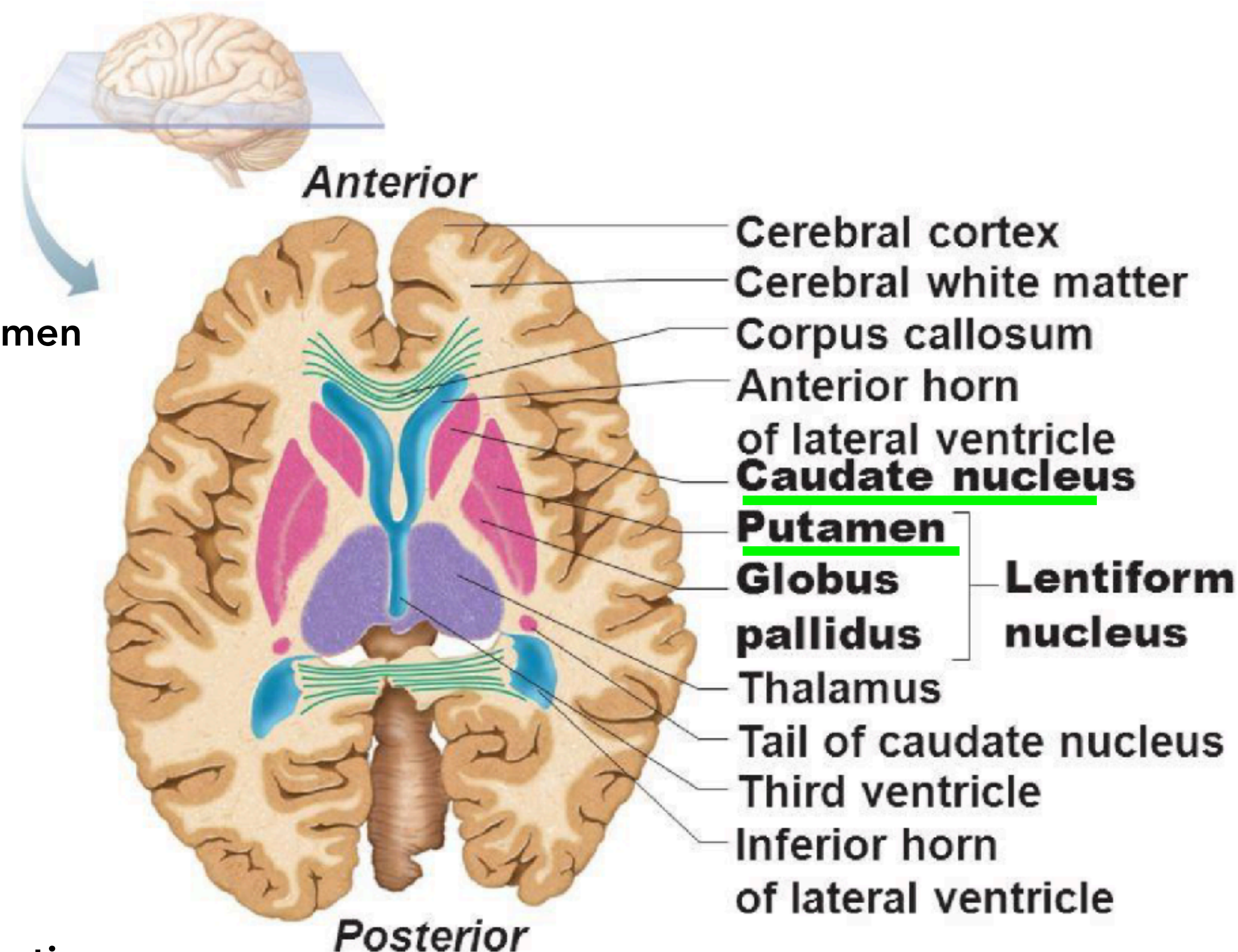
Ibogaine has documented dopaminergic effects the caudate and putamen

## CAUDATE:

- Associated with reward, motivation, visual processing, risk analysis
- Craving linked to the mesolimbic pathway
- Goal-directed behavior and stimulus-driven habits

## PUTAMEN:

- Learning and motor control, including language functions, reward, cognitive functioning, and addiction
- Associated with movement disorders and OCD
- Plays a critical role in the automatization of behavior and habit formation
- Habitual patterns - reduced glutamate/NMDA turnover in putamen





# CEREBELLUM & FUNCTIONING IN ADDICTION

Under-explored brain structures “reptilian brain”- classically associated with movement

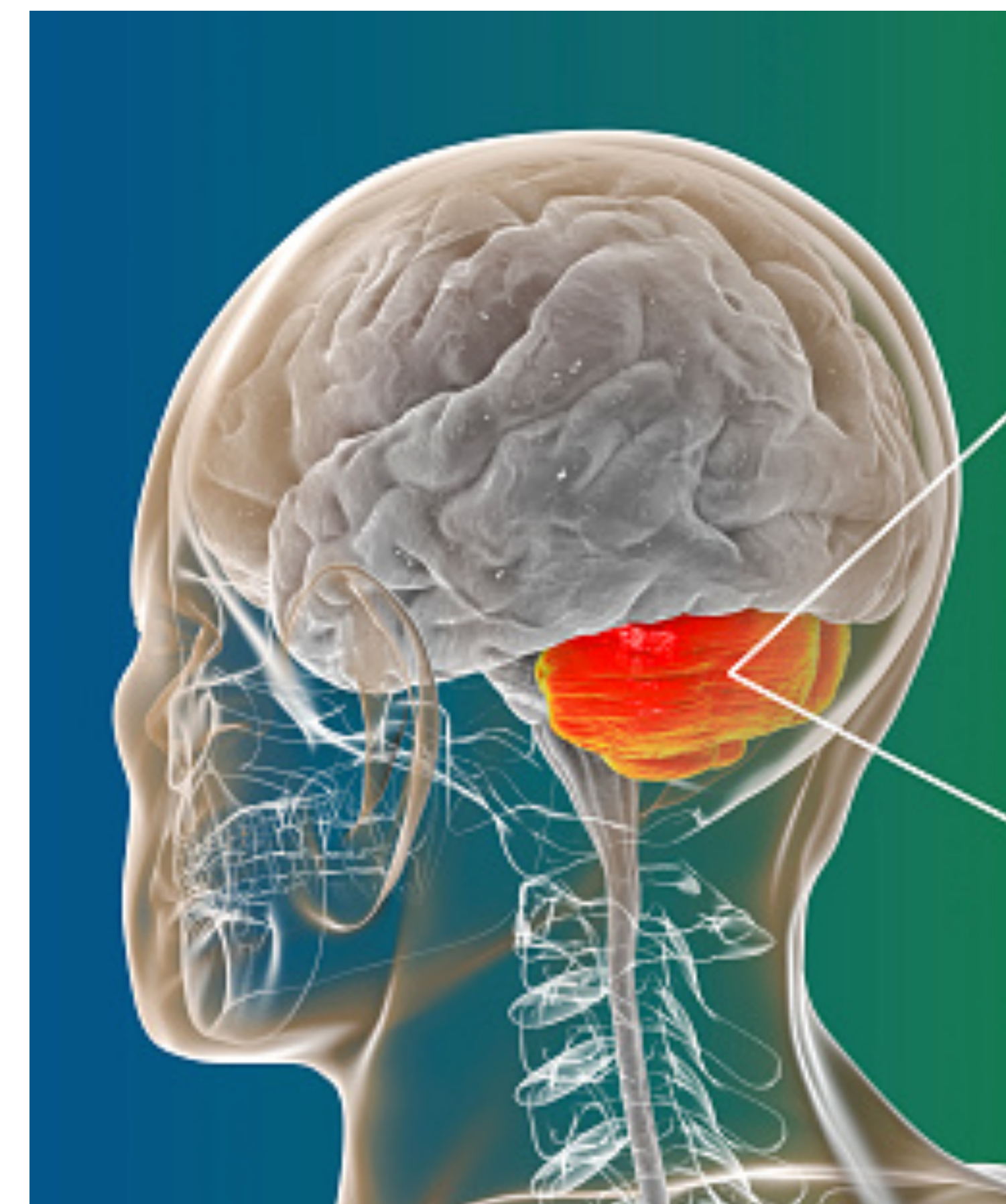
Recent investigations into cerebellar functioning + addiction identify region involved with:

- Reward processing
- Motivational and cognitive control processing
- Pain perception
- Processing drug-induced cue-related memories & Pavlovian learning

Anti-addictive effects via loops through:

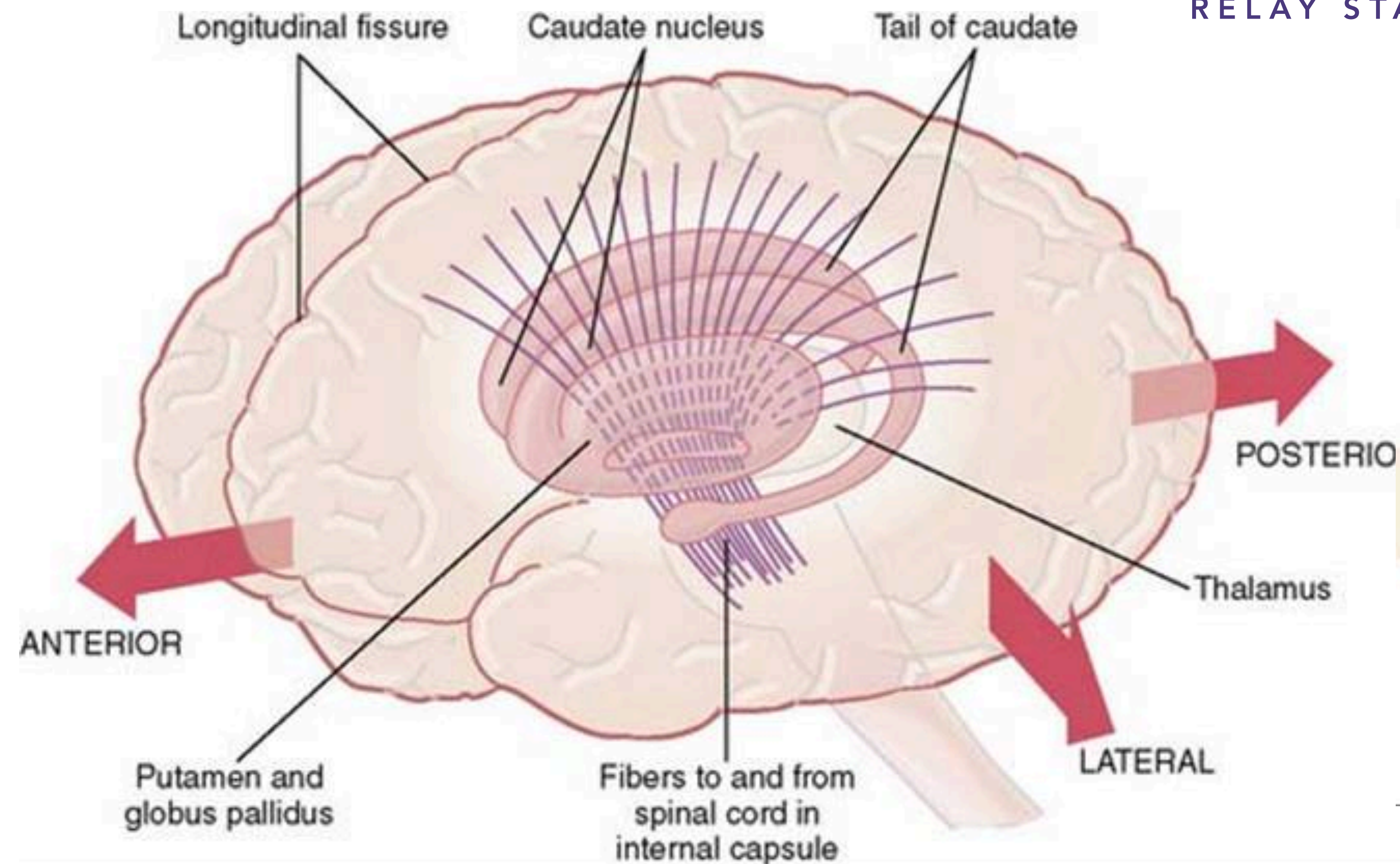
- Dopamine and Glutamate projections from cerebellum to the Ventral Tegmental Area (VTA) is responsible for persistence of drug-related conditioned memories and escalation behavior
- High density of opioid and sigma receptors

Hypotheses: Ibogaine may foster neuroadaptive cellular changes and unlearning of conditioned drug responses through cerebellar pathways

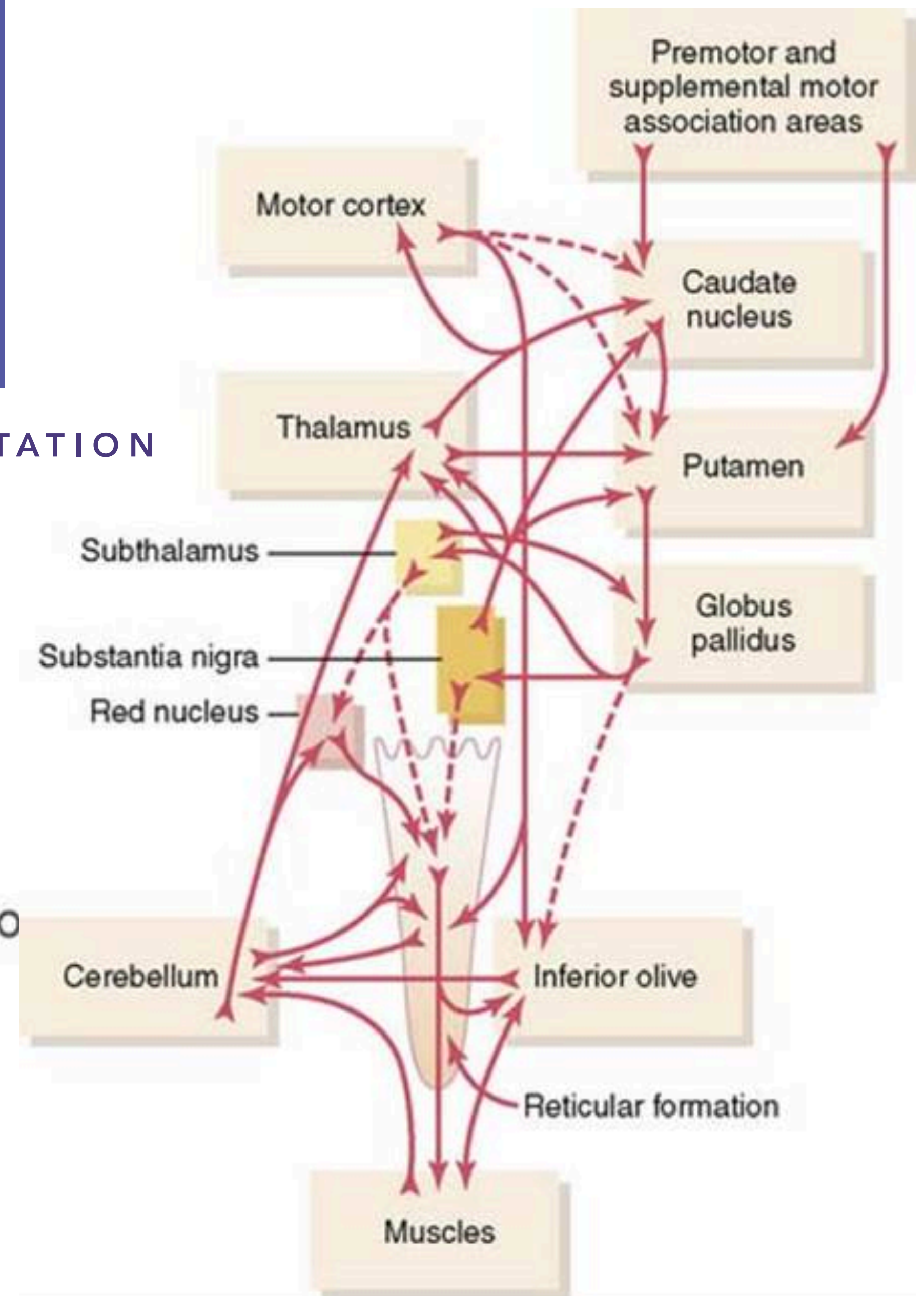




# BASAL GANGLIA & CEREBELLAR TRACTS



## RELAY STATION



# How does Ibogaine work in the mind?



Ben Taylor - Dancing the Bwiti



# Psychological Facets of Ibogaine Experience

## Visionary Content

**Ancestors - faces, spirits**  
**Panoramic Planetary Landscapes - Often African**  
**Processing violence / destruction**  
**Traveling through Outer-space / Cosmic Landscapes**  
**Cinematic film reel / TV set / Screen**

## Psychotherapeutic Effects

**Autobiographical / Trauma processing - Reliving life**  
**Self/Meta-Observation**  
**Confrontation / Awareness of defenses - denial/avoidance**  
**Ego death / dying / rebirth - embryo to death to new life**  
**Emotional Catharsis**  
**Relational processing - empathy, forgiveness, love**  
**Existential / Spiritual awakenings**  
**Letting Go / Feeling Transformed**

## Cognitive / Perceptual Effects

**Enhanced Vision / Acuity / Color Enhancement & Saturation**  
**Visual Tracers**  
**Enhanced Auditory Acuity**  
**Impaired Verbal Fluency / Reduced Attention Span**

## Physical Effects

**Detoxification / Purification**  
**Purgation / Vomiting / Sweating**  
**Dizziness / Nausea / Ataxia**  
**Abnormal heartbeat / Increased heartbeat perception**



Artist: Chor Boogie

## A case report SPECT study and theoretical rationale for the sequential administration of ibogaine and 5-MeO-DMT in the treatment of alcohol use disorder

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## Report of ibogaine psychedelic/spiritual experience

## Air-Force Veteran with alcohol abuse

"He reported experiencing close-eyed visions shortly after the third ibogaine dosage that began with images of floating through the universe and being surrounded by the stars.

He began to ask himself questions that were previously transcribed with the counselor pertaining to his alcohol use and past traumatic events. He noted when he would ask himself or "God" a question, he experienced being visually transported to a new realm. He described these realms similar to levels of a video game, and the symbols and images were not immediately associated with the contents of his questions.

However, after being "transported to several levels," he began to see the symbols were showing him the answers to his questions in symbolic form. For example, on one "level," he was visually taken to a scene of "pesky beings that were leeching energy from [his] body," which he later interpreted as, "the spirit of the yeast in the alcohol that was holding onto [him]." He reported that when he became nauseated the, "pesky beings" were telling him not to vomit. When he began to physically vomit, the beings were shouting "No!" and appeared to be leaving his body through the purging.

He described seeing, "a universal cosmic matrix that had a central column of electric light and spiritual beings merging into the light." The "pesky beings" were telling him not to enter the light, but he was given "a pair of rocket boots" by "the creator of the matrix" and merged into the light, which felt healing and empowering to his "true self."

# Out of 44-Items from Persisting Effects Questionnaire

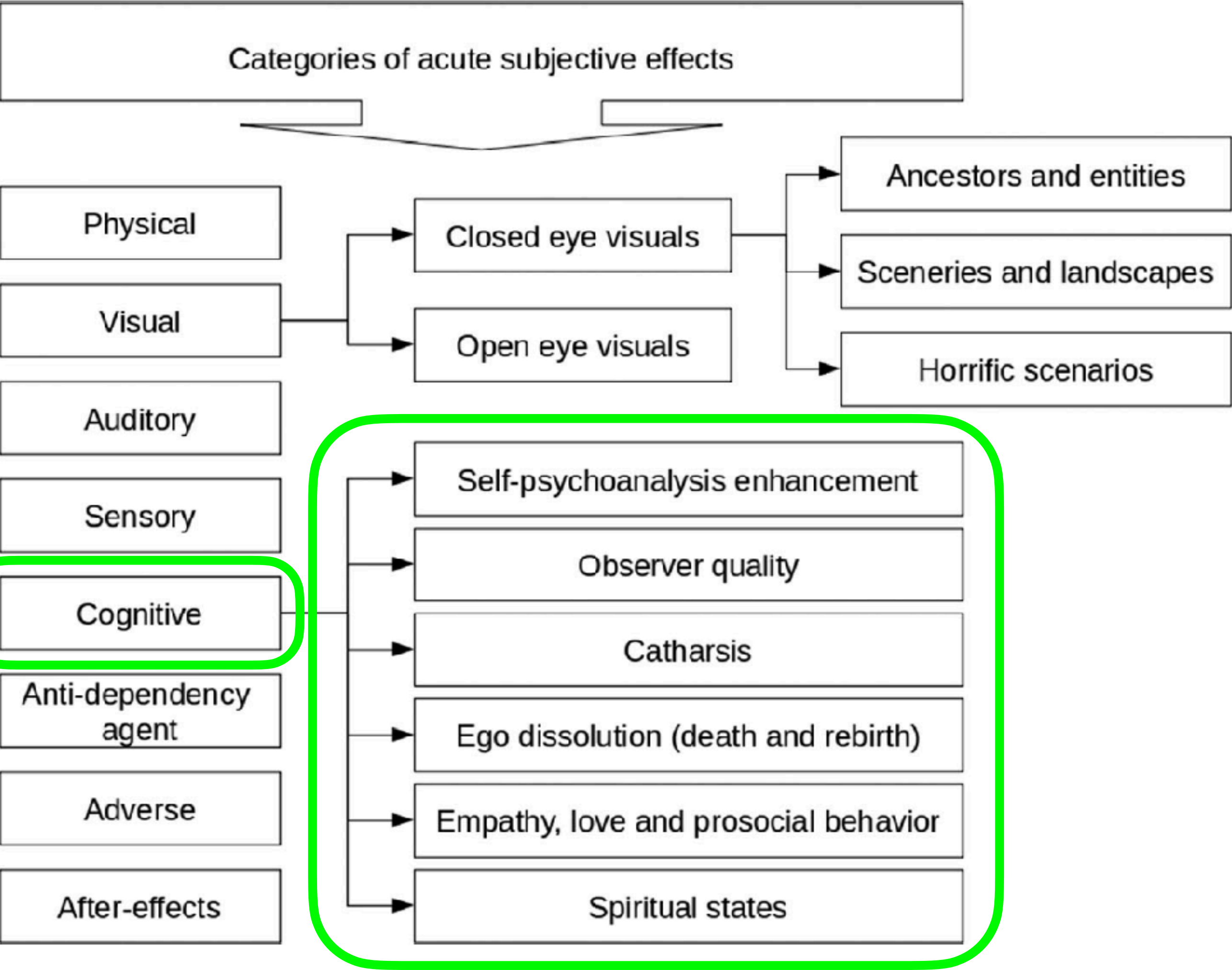
A Mixed-Method Analysis of Persisting Effects Associated with Positive Outcomes Following Ibogaine Detoxification

Alan K. Davis, Elise Renn, Austin-Marley Windham-Herman, Martin Polanco & Joseph P. Barsuglia

Top Items Endorsed Between Treatment Responders from Non-Treatment Responders	Cohen's d
The sense of meaning in your life has increased	1.27†
Your ability to tolerate difficult or painful feelings has increased	1.22†
Your experience of sacredness in daily life has increased	1.18†
Your ability to be a more authentic person has increased	1.12†
Your feelings of love and openheartedness have increased	1.01†
Your experience of joy or bliss has increased	.96†
Your capacity for coping with stress has increased	.93†
Your gratitude or sense of gratefulness has increased	.91†
Your appreciation for life has increased	.90†
Your experience of inner peace (i.e., centeredness, serenity, calmness, contentment) has increased	.90†
Your feelings of unhealthy anger (e.g., bitterness, hostility, scorn) have decreased	.89†



*The Ibogaine Experience: A Qualitative Study on the Acute Subjective Effects of Ibogaine*



Cognitive Effects

The individuals experienced wakefulness for at least 24 hours.

Enhanced analytical capabilities and thought connectivity where abstract and fluid thoughts were making seemingly unrelated ideas intertwined, resulting in an abundance of new and insightful ideas.

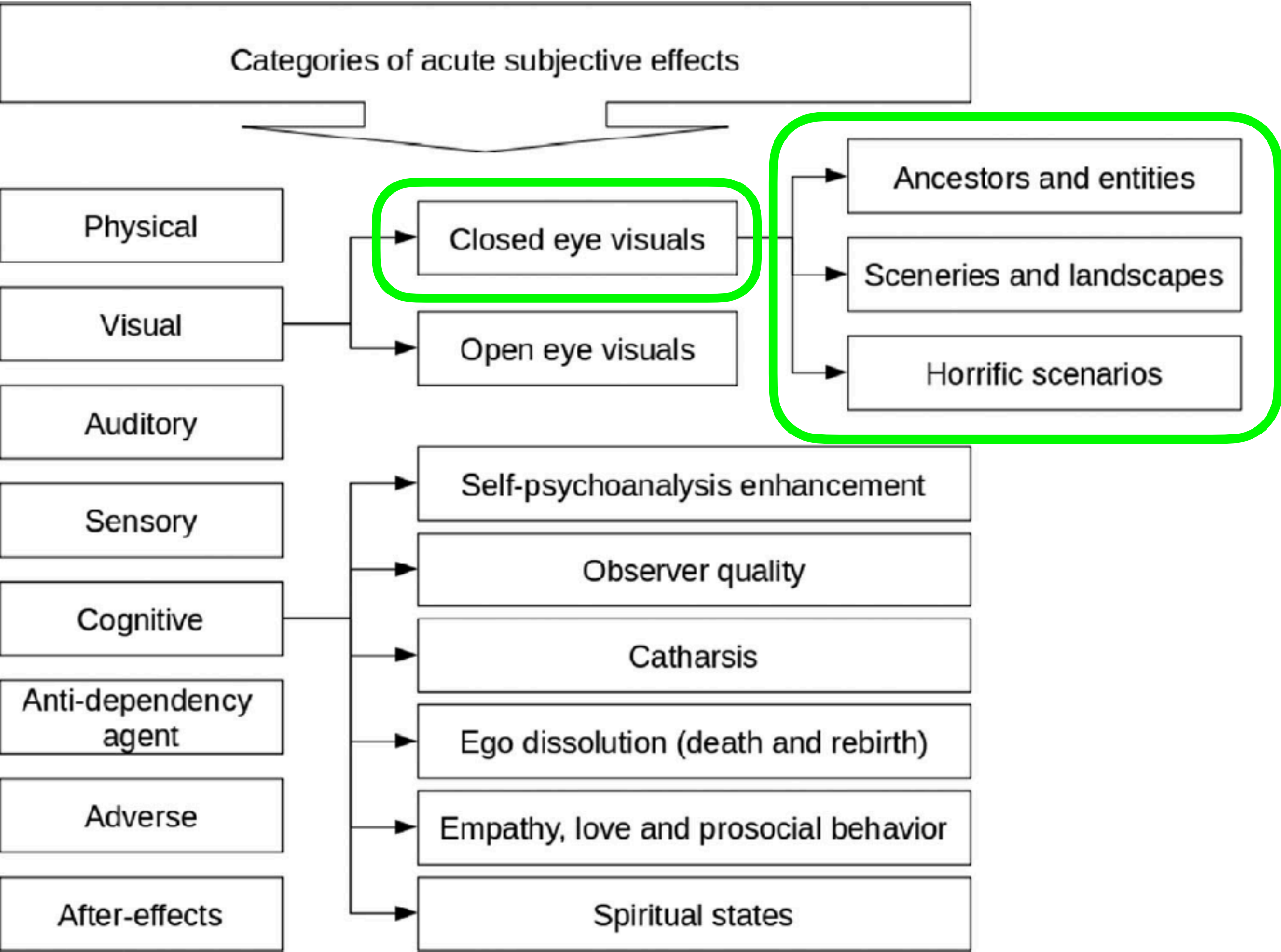
Increase of creativity, producing enhanced problem-solving capabilities, child-like fascination, increased appreciation of things, and an overwhelming feeling of profoundness.

Immersion and memory enhancement, which enabled the individual to easily access stored memories and recall them.

Deep understanding of everything (e.g., the organization or structure of the universe, consciousness, everyday life, causalities) due to enhanced conceptual thinking. The information was perceived both in its entirety and in overwhelming detail.

The individuals were very introspective, in a mindful, meditative-like state, with attention focused on the immediate experience. Some individuals experienced vomiting as part of “quieting the mind.”

# The Ibogaine Experience: A Qualitative Study on the Acute Subjective Effects of Ibogaine



The visionary experience (as referred to by the study participants), dreaming while awake was experienced by many individuals and described as profound images or movies playing out in the head.

Most describe the images as being very intense, rapid, and containing a lot of information, even unnecessary information, which was, in some cases, perceived as confusing.

Ancestors & Entities

*"I would see a young face that was very quickly morphing and aging in front of me. I would see this being go from young adulthood to old age. Actually they were just disembodied heads that I've recognized as ancestors. And then the heads started to look down as they disintegrated"*

Sceneries & Landscapes

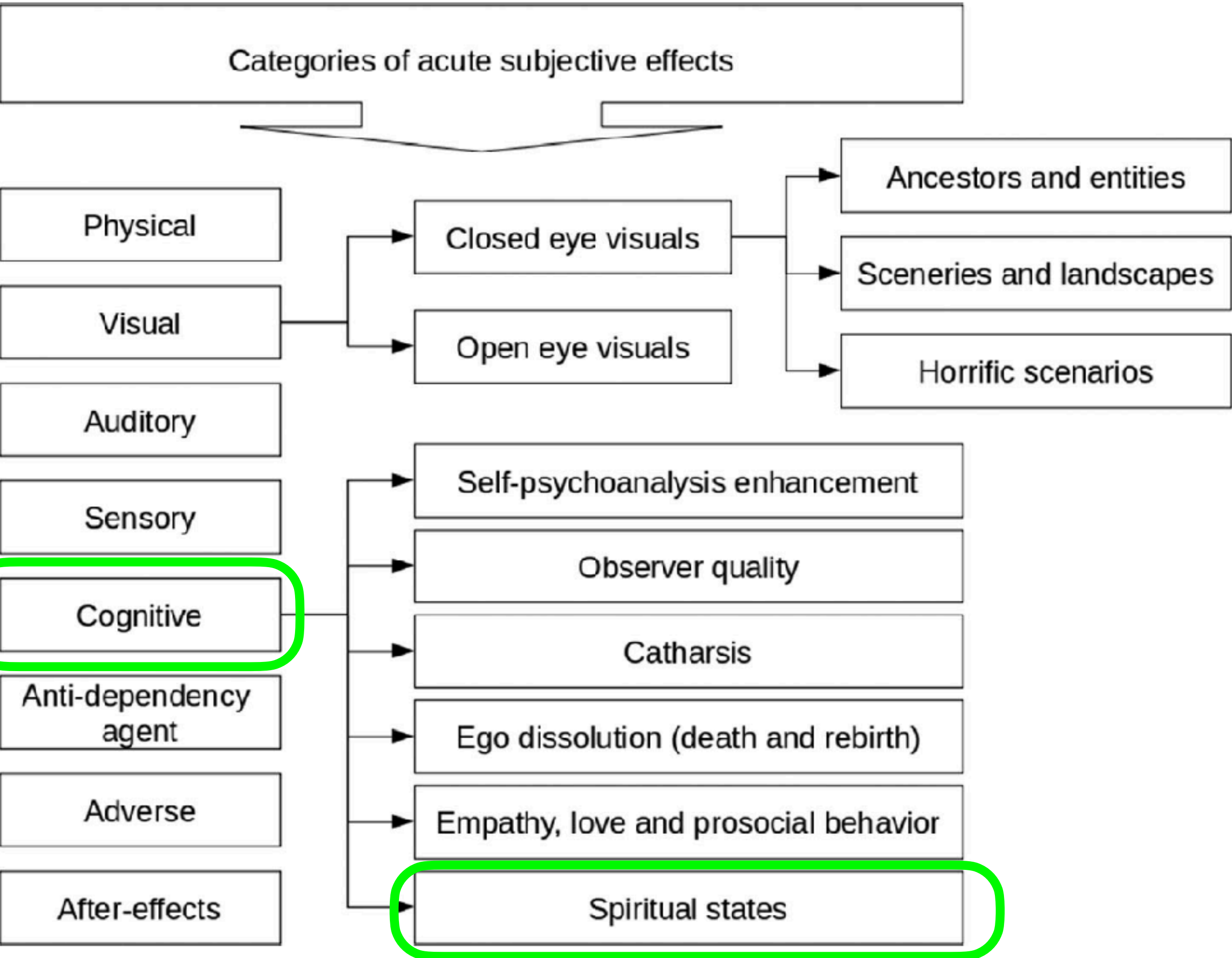
*"It was a bit like the movie Baraka. Lots of different images of different cultures all around the world, beautiful cinematography. Kind of going from heaven to hell. Lots of beautiful images of pristine nature and then suddenly images of like really hectic city life and town and busy and pollution and industry, really contrasting. Essentially, what we are doing on the planet. Where we have come from and where we are headed and what we are doing now."*

Horrific Scenarios

Common were feelings of impending doom and visions of apocalyptic scenes, or just darkness accompanied with a profound feeling of aloneness. The imagery was on occasion historical such as the mistreatment of women in the middle ages, or contemporary, like the controlling role of media and its influence on society. Sometimes futuristic scenarios of destruction on the planet were seen, such as scenes of wars, fires burning, and bloody images of dead animals and bodies.



The Ibogaine Experience: A Qualitative Study on the Acute Subjective Effects of Ibogaine



Spiritual Effects

Spiritually, a sense of unity or interconnectedness was experienced by most. While many gained an understanding of spiritual roots, the source of life or life’s purpose, all agreed they had become better persons.

Most importantly, the experience brought a sense of hopefulness for the future, especially in cases of drug dependence. In some cases interdependent opposites were described such as light–dark; bad–good; life–death; disconnection–connection to people.

Subject 1:  
*"Ibogaine reconnected me with my life’s purpose. And I’ve discovered the fact that whenever I didn’t had a life purpose, I’ve felt like I just wanted to die. Even if my life’s purpose is not clear, it’s present. I want to live and I want to love, and I want to connect and I want people to connect and love and create a better world."*

A phenomenological analysis of the subjective experience elicited by ibogaine  
in the context of a drug dependence treatment

EDUARDO EKMAN SCHENBERG<sup>1\*</sup>, MARIA ANGÉLICA DE CASTRO COMIS<sup>1</sup>, JOÃO FELIPE MOREL ALEXANDRE<sup>2</sup>,  
LUÍS FERNANDO TÓFOLI<sup>3</sup>, BRUNO DANIEL RASMUSSEN CHAVES<sup>1</sup> and DARTIU XAVIER DA SILVEIRA<sup>4</sup>

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<sup>3</sup>Faculdade de Ciências Médicas, Universidade Estadual de Campinas (UNICAMP), Campinas, Brazil

<sup>4</sup>Departamento de Psiquiatria, Universidade Federal de São Paulo (UNIFESP), São Paulo, Brazil

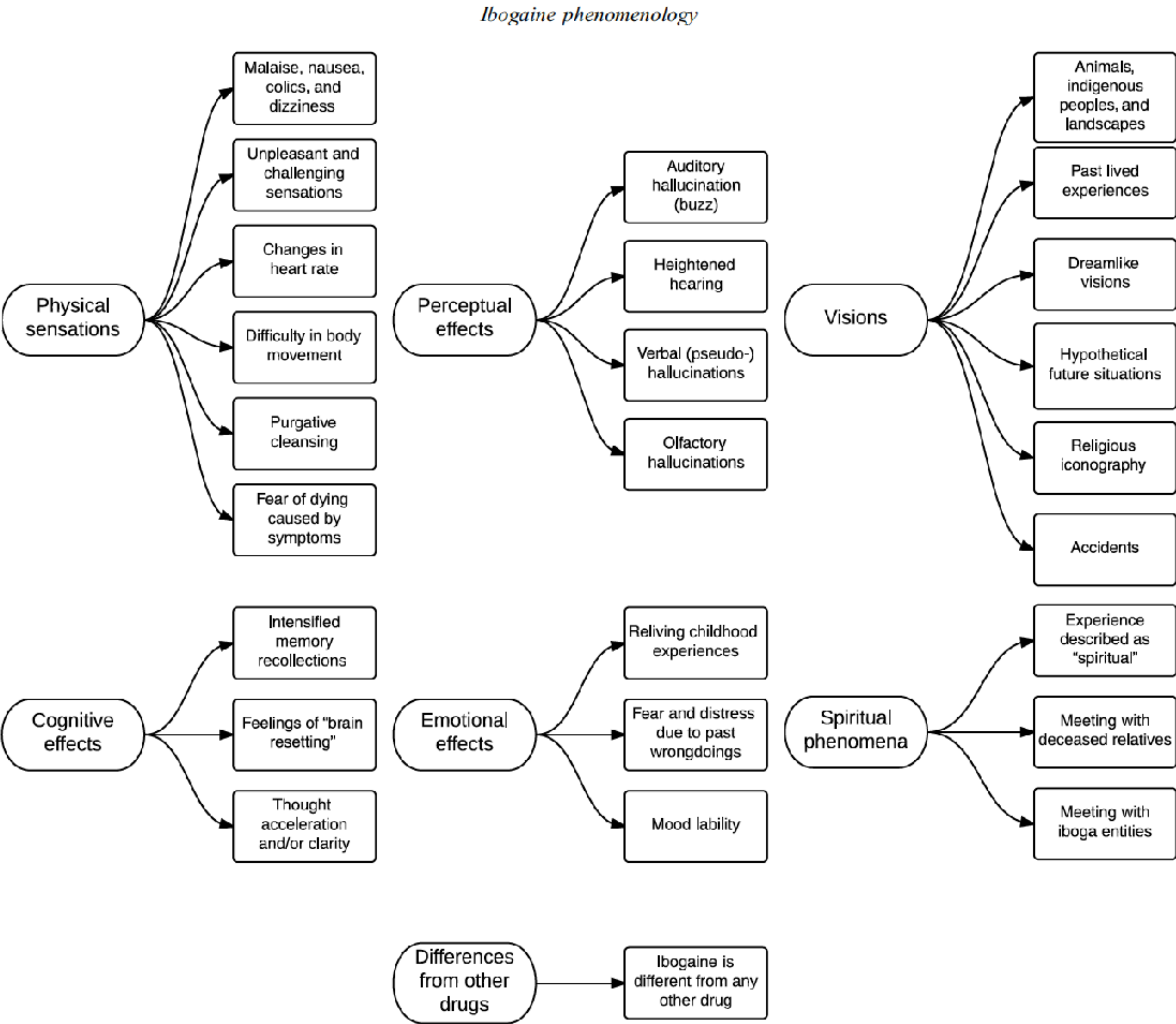


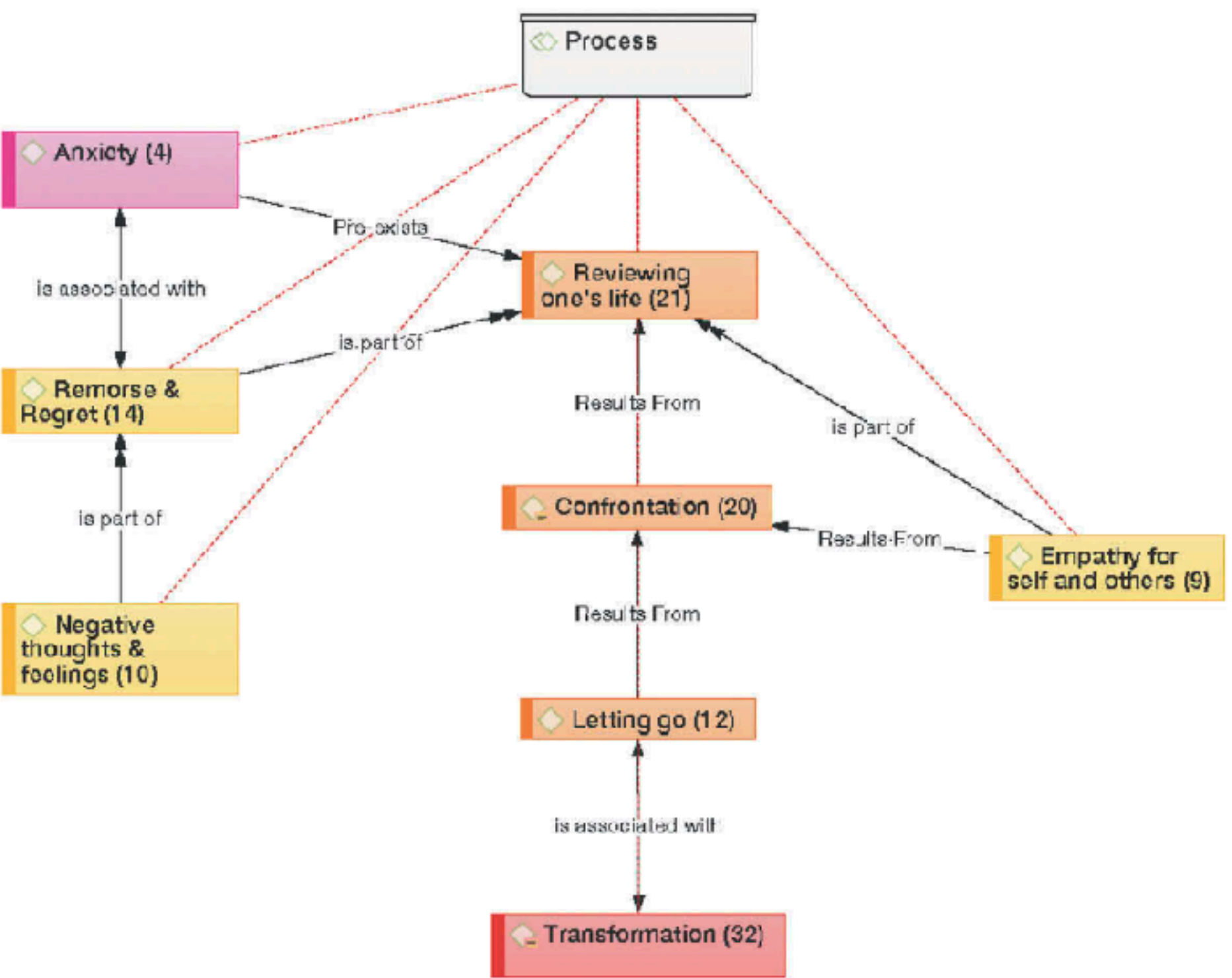
Figure 1. Themes and categories of the phenomenological description of the ibogaine experience reported by 22 patients that underwent combine ibogaine and cognitive behavior therapy in Brazil that emerged using interpretative phenomenological analysis

ARTICLE

Ibogaine and Subjective Experience: Transformative States and Psychopharmacotherapy in the Treatment of Opioid Use Disorder

Thomas K. Brown, PhD<sup>a</sup>, Geoff E. Noller, PhD<sup>b</sup>, and Julie O. Denenberg, MA<sup>c</sup>

<sup>a</sup>Academic Enrichment Programs, UC San Diego, La Jolla, CA, USA; <sup>b</sup>Department of General Practice and Rural Health, School of Medicine, University of Otago, Aotearoa, New Zealand; <sup>c</sup>Department of Family Medicine and Public Health, UC San Diego, La Jolla, CA, USA



**Table 1.** Higher-order constructs, grouped themes, and examples of related quotes at the third iteration of thematic analysis.

Higher-Order Construct	Grouped Themes (Number of Utterances, n= x)	Examples of Quotes
Vision content	Auditory effects (n = 15)	"The first thing I began to notice was auditory—the sound like a water bottle caught in suction. A suction sound that turned into an insectoid buzzing sound." (S21, Mexico)
	Visions (n = 21)	"I remember one of the Bwiti slightly trembled and the Iboga spirit shook like a rattle." (S018, New Zealand)
	African images (n = 9)	"I also saw African things, wilderness, lions. Tribesmen. And this cycle was repetitive." (S23, Mexico)
	Colors (n = 7)	"Music was enhanced, and the sound was morphed into angelic sounds and colors." (S5, Mexico)
	Spirit being (n = 9)	"My first vision was of an African man who was very small in stature. He came and sat on my bed. I remember being really pleased to see him. I knew that he only had love for me and was there to help." (S007, New Zealand)
Perceptions	Planets, Earth, cosmic images (n = 16)	"We flew through the solar systems and came back to Earth." (S21, Mexico)
	Physical experience of vision (n = 15)	"The visions I remember most were Sci-Fi, like Star Wars." (S005, New Zealand)
	Negative references to impact of drug taking (n = 7)	"I felt my withdrawal symptoms begin to subdue. I felt a band of numbing ecstasy string across my body which took all the withdrawal away." (S18, Mexico)
	References to family (n = 15)	"I was mournful of the damage I'd done to my body and to my relationships with family and friends." (S28, Mexico)
		"There was some really horrible stuff, like my father saying: You stupid little bitch!" (S008, New Zealand)
Process	Cleansing/healing (n = 8)	"I saw my family from young to older and how everything has been and how I affected them." (S9, Mexico)
	Sense of oneness with everything (n = 7)	"My brain was being repaired, rewired. When it passed over bits that needed damage control it would pop the damaged bit, like bubble wrap." (S019, New Zealand)
	Anxiety (n = 4)	"I then was traveling at super luminal speeds in this sense of the infinite for several hours where I saw random colors, shapes and images of rebuilding occurring. I think it was my brain showing me my receptors being repaired and rebuilt." (S18, Mexico)
	Reviewing one's life (n = 21)	"On the day of my treatment, I remember sitting on the step outside my house, unable to stop shaking and trying not to back out of the plan that we had so carefully made." (S007, New Zealand)
	Negative thoughts and feelings (n = 10)	"I kept seeing clips—real memories, of high-school girlfriends and playing music with friends—but then also clips of the present day in an alternate reality where I hadn't squandered so much love or compassion that had been offered to me." (S21, Mexico)
	Empathy (n = 9)	"Many of these thoughts were reflections of my past, mainly my failures. When these feelings became intense I became very overwhelmed and upset at times." (S15, Mexico)
	Confrontation (n = 20)	"I was also able to begin to see how, because I felt so unlovable, I paid in one way or another for love. I was able to stop that and open myself up to real love for maybe the first time in my adult life." (S2, Mexico)
	Letting go (n = 12)	"In the various body motions crippled in pain I would feel the Iboga spirit meeting me in a wrestling combat." (S018, New Zealand)
	Transformation (n = 32)	"Around the time of my father's death, I had acquired from Dad a relentless and very negative voice in my head. During my journey, this voice left me. It was extraordinary! It was like a tape loop in my head broke and the tape spun off into space. It was so noticeable that I could sense the space in my mind that was freed up by its departure." (S2, Mexico)
		"I awoke 3 days later in tears of joy KNOWING that I was never alone and never would be alone and that death is just a doorway to another reality." (S18, Mexico)



# beōnd

**Ibogaine Science:**

How Ibogaine Works in the Brain to Treat Substance Use Disorder

Dr. Joseph Peter Barsuglia - Advisor to Beōnd  
+ Crossroads Treatment Center, Mission Within, VETS, Sōhei, Journey Colab, Woven Science

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