AN MMPI-2 STUDY: PERSONALITY TRAITS OF NORTH AMERICAN

AYAHUASCA DRINKERS

By

Kirby Surprise

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CERTIFICATE OF APPROVAL

I certify that I have read AN MMPI-2 STUDY: PERSONALITY TRAITS OF

NORTH AMERICAN AYAHUASCA DRINKERS, by Kirby Surprise, and that

in my opinion this work meets the criteria for approving a dissertation submitted

in partial fulfillment of the requirements for the Doctor of Psychology degree in

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Kirby Surprise
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Esther Nzewi, Ph.D., Committee Chair

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ABSTRACT

Thirty-four frequent North American drinkers of ayahuasca were

administered the Minnesota Multiphasic Personality Inventory (MMPI-2).

Patterns of elevation above T=55 were found in both female and male groups for

scales Hy. (Hysteria), RC4 (Antisocial Behavior), RC8. (Aberrant Experiences)

BIZ (Bizarre mentation), R (Repression), O-H. (Overcontrolled Hostility), AAS

(Addiction Admission) and PSYC. (Psychoticism). Personality descriptors from

A high use and a low use group   comparison was done based on number of uses above or below the mean. In the high ingestion group there was a decrease in the mean T score on scales 1 Hy (Hysteria), 7 Pt. (Psychasthenia), 8 Sc (Schizophrenia), 9 Ma (Hypomania), Si (Social Introversion), MDS (Marital Distress), and AAS (Addiction Admission Scale). There was an increase in the mean T scores on APS (Addiction Potential Scale), INTR (Introversion/low positive emotionality). All scores, with the exception of low AGGR are however within normal ranges of personality. No overall difference between the high and low use groups based on mean T scores for the scales and subscales was found.

The study found personality traits of North American ayahuasca drinkers to be within normal limits of personality and had no clinically significant findings. The small moderate findings that were made reflect the personality traits of the participants at the time of their MMPI-2 responses. Thus it is not possible to determine if the obtained personality traits were influenced by the taking of

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CHAPTER I: INTRODUCTION

Ayahuasca and Its History

Ayahuasca is a tea with psychoactive properties that originated in the

Amazon basin in pre-Columbian times. The exact time of the beginning of human

use of the tea in its present form is unknown, but remnants of psychoactive

substances with uses similar to ayahuasca, or that were ayahuasca, have been

found on artifacts such as preserved mummies of human sacrifices, implying that

the substance was taken prior to sacrifice in some religious context. In one case,

remnants were found on a stone ceremonial cup, which also implies sacred use.

The traces of psychotropic plants may have been from as early as 500 B.C.

(Naranjo, 1979, 1986).

I believe it likely that ayahuasca use could be almost as old as human

habitation in the Amazon basin. People tend to search for medicinal plants in

telepathy as well as cures for physical, mental, and social problems. The vine is

traditionally said to possess its own highly benevolent, but unpredictable spirit

that "speaks" to the drinker. As powerful an alteration of the drinker's

consciousness as this appears to be, the experience is much less powerful than the

most commonly used preparations that include a second plant in the infusion that

contains the hallucinogen dimetheltryptamine (DMT). The inclusion of the leaves

of the psychotria viridis produce profound visionary experiences of overwhelming

intensity that are often described as of literally cosmic and transpersonal

proportions. Drinkers report visions of the meaning and form of the universe,

speaking with spirits and the dead, and journey to realms beyond the physical.

The experience is said to be intense, uncontrollable, both hellish and ecstatic, and

is often reported as profoundly meaningful and healing. Ayahuasca has also

traditionally been used to seek power to harm one's enemies through magic, by

separation between religion and social power structures. The conquest of the new world entailed overthrowing not just kings, but traditional religious and shamanic beliefs and practices. This was done through torturing, murdering, or terrorizing anyone practicing forms of belief that contradicted those of the European conquerors and thus challenging their power. The guns, germs, and steel of the European prevailed in the larger population centers, and the open use of psychotropic plants for any purpose, which they had deemed demonic, was successfully repressed.

In the rainforest however, the use of ayahuasca continued as it has since long before the conquistadors arrived. Much of the European conquest was confined to the costal regions and the trade routes along the larger rivers where transport by ship and boat made travel possible. Long distance travel into the interior of much of the continent remained extremely difficult, and the projection

of ayahuasca important enough to pass down through the generations with at least 42 known names (Luna, 1986).

Without a common name or ties to a wide singular, identifiable culture, knowledge of ayahuasca passed out of westernized thought. Centuries passed. The Portuguese and Spanish languages had spread throughout South America and become the common languages of the large population centers. Late in the nineteenth and early twentieth centuries, worldwide trade in commodities such as hardwood, cattle, and raw rubber tapped from the rainforest, combined with new transportation technologies, caused an expansion of westernized culture deeper into the rainforest of the Amazon basin. The conversion of forest into agricultural and grazing lands, and the search for natural resources, again brought western culture into contact with native populations in which ayahuasca was still used. The romanticized version of the passing of the knowledge of ayahuasca back into

I believe it unlikely that diverse cultures all acted with such magnanimity towards the invasion of their territory, or that the gradual process of encroachment would cause a sudden and unified method of introduction of ayahuasca back into the wider population. It is more likely that gradual contact with diverse groups and individuals occurred for some time, with stories of the legendary brew of unknown composition circulating, and the tea itself becoming more common in open use by healers, shamans, and traders. It may be that in this way westernized culture slowly became aware that ayahuasca had always been there. In the early twentieth century ayahuasca crossed a cultural bridge when it was adopted as the sacrament of several syncretic Christian churches that specifically formed around ayahuasca itself as the center of their religion. These religions, the Uni De Vegetal (UDV) being the first and largest, formed their own communities centered on the use of ayahuasca. Ayahuasca has dietary requirements because it

Ayahuasca had re-emerged from its isolation in the tribes of the rainforests and became an even stronger force than before. It was now inextricably entwined with Christianity, the religion that had driven it out of common western use and knowledge; it drew respectability from these cohesive and conservative churches. Issues of religious freedom would now have to be addressed in order to repress its use. With the expansion of the churches came other advantages, church members were not isolated tribes with diverse languages and cultures. Many spoke Portuguese, and individuals had transportation out of the rainforests to the city centers of Peru and Brazil, where they spread the word and religion of ayahuasca amongst the poor and working classes. Soon "works" were happening in the cities. The belief that ayahuasca could allow direct communication with god and provide profound healing began to spread as people participated in open services, stayed to be part of the religion, or returned to the rainforests seeking the tribal

By the 1970s, there were already many anthropological reports of

westerners who had joined in ayahuasca ceremonies and observed native use of

the tea, but there was not an understanding of exactly what the chemical

components were or why it was so powerfully hallucinogenic. The tea itself had

not yet been analyzed. This may have been due to several factors. The practice

itself was obscure to the westernized parts of the culture, which were already

occupied with wars on various drugs, such as cocaine, that had more obvious

social problems associated with them. Information and communication was

increasing as technology made access faster and more widespread, allowing those

interested in hallucinogens, from an academic or personal perspective, knowledge

that ayahuasca existed, but resources for actually finding ayahuasca were not

commonly known. And even if someone was shown the plants to be used, few

had the knowledge to identify them. This was compounded by the fact that

In Brazil the government made the use and possession of ayahuasca illegal. Brazil already had severe social problems over the cocaine trade in the rainforests and trafficking by anti-government insurgents. Influenced by the anti-drug policies of the United States, Brazilian officials began to ask who these churches or ayahuasca drinkers were, what were they doing in the forests, and what political problems were brewing in churches where people were hallucinating in four-hour services. The government in Brazil, in an echo of earlier efforts by Europeans, tried to shut down ayahuasca use. But the members of the UDV—the largest church, a conservative, peaceful membership of over 6,000—were unified in pursuing their religion, and they had sufficient resources to do so. They drew support from researchers, scientists, anthropologists, and others familiar with their religion, forging a cooperative relationship with the Brazilian government to conduct an organized investigation of their religion and

The LD50 of ayahuasca, the dose at which it would be lethal to half the

population given it, is estimated at approximately 7000ml, an amount at which the

water in the tea alone would cause renal failure. Ayahuasca itself produces

nausea, and often induces vomiting at doses of 25ml. The possibility of ingesting

a lethal dose is remote, and there is no record of such an incident ever occurring.

Barring an allergic reaction to the plants themselves, ayahuasca is non-toxic. As a

result of the investigation of ayahuasca and the UDV, the government of Brazil

determined that neither presented a substantial enough risk to warrant interfering

with the practice of religious freedom, and the law banning ayahuasca use was

overturned. Similar freedoms have been granted in Peru, Amsterdam, and after a

long and contentious battle, the United States itself in 2006 (Supreme Court

syllabus 2006).

       DMT had long been known to be a hallucinogen, synthesized first in the

a DMT-containing plant. A flurry of activity ensued during the following years in which scientists and lay people began testing plants all over the world looking for other sources of DMT and related compounds, such as 5-MEO-DMT and bufotanine. It was soon realized that DMT was present in many common plants all over the world; this knowledge made commercial ventures to market these plants relatively easy and affordable. *Mimosa Hostilis,* for instance, is a fast-growing tree whose root bark is as much as .57 % DMT (Ott, 1994). Also called *Jurema,* this tree had been planted and farmed in large tracts from Mexico throughout South America to provide firewood for the steam-powered railroads of the nineteenth century. *Jurema* also had a traditional use in which it was brewed like ayahuasca, but sometime during the last 200 years the knowledge about adding a plant containing an MAOI was lost. The tradition of drinking brews with a high, but inactive, DMT level remained. This knowledge was reintroduced when

A desire for the ayahuasca experience began rising in both the United States and Europe by the early 1990s. Commercial harvesting of plants related to ayahuasca began, and with advent of the Internet, businesses began to ship the formerly unavailable and obscure plants all over the world, cheaply and in bulk. The money available from northern consumers also spawned ayahuasca tourism. Often linked to ecotourism, participants could travel in groups to the rainforests or other retreat locations to drink ayahuasca with native ayahuasca shamans, some authentic, others less so. Persons purporting to be ayahuasqueros also began leaving South America and touring North American and European cities to hold ayahuasca ceremonies for anyone who could afford the attendance fee. The UDV and the Santo Daime established themselves in both North America and Europe. Internet sites and chatrooms dedicated to ayahuasca and DMT appeared, containing detailed instructions on the making and use of ayahuasca, as well as

form relationships in the spirit world that benefit the shaman and the community.

In North America today, I estimate that there are about 6,000 frequent ayahuasca

users. Those with whom I have communicated—both solitary drinkers and circles

of drinkers—believe that ayahuasca has helped them progress on a spiritual path.

I have no estimates of how many people have engaged in ayahuasca tourism, but

it has probably been several thousand more. Given the newly legitimized use of

ayahuasca by the UDV in the United States—a nation long seen as driving a

severely anti-drug policy worldwide—and the freely available knowledge of how

to identify and use the constituent plants, it is possible that ayahuasca use and the

number of individuals who choose to frequently ingest it will continue to grow. It

is inexpensive in its analogue form, currently as little as $2 per use. It can be

produced by the drinker on any stovetop, requires no risk of contact with drug

dealers, has little possibility of attracting the attention of authorities, and presents

questions from other testing questionnaires, hospital staff members, and colleagues. They presented these questions to 724 individuals, the resulting sample matching the 1930 census. They matched the answers to patients with a known diagnosis and attempted to find out which questions distinguished the different diagnostic groups. It was hoped that a simple matching system could be developed in which high levels of positive responses on a set of questions that corresponded to a particular diagnostic category could be created.

This turned out to be problematic. The diagnostic categories were not discreet entities. Patients with different diagnoses often share some symptoms. For example, anxiety may be a feature of depressive and anxiety disorders, but it can also be co-morbid with psychotic and compulsive diagnoses. Further, just because someone endorsed items that the normative sample of patients with an anxiety disorder endorsed does not mean they have an anxiety disorder. Even

IV revised and has major differences from the DSM-II, making the attempt to create a one-on-one correspondence between MMPI scales and diagnostic categories extremely difficult.

The MMPI consisted of eight clinical scales: hypochondriasis, depression, hysteria, psychopathic deviate, paranoia, psychasthenia, schizophrenia, and hypomania. Two later scales were developed. The first was the Masculinity-Femininity scale, which was intended to distinguish between homosexual and heterosexual males. The second was the Social Introversion scale, which was intended to distinguish between more outgoing and less outgoing women, but was later expanded to cover both genders.

Four scales were eventually added to assess responses. The Cannot Say scale looks at the number of blank items on the test. The Lie scale measures the respondent's image of their own level of virtue and moral values, specifically

established to replace this single elevation system. In a 3 point system the highest

two peaks on the clinical scales would be compared as a type. A "2-4/4-2" is

shorthand for someone with a high score on scale 2, the next highest score on

scale 4. This set was then looked up in the codebook to compare what personality

characteristics people with similar endorsement patterns had from the

standardized sample. This yielded a more complex view of the personality that

was no longer confined to a particular diagnostic category. The MMPI had

changed from the original intent of classifying patients into diagnostic categories

for treatment, to a tool that assisted the administering mental health professional

in making their own informed judgments. Using straight MMPI coding to make

an isolated diagnosis of a client apart from observed administration of the test,

case review, and additional overlapping test instruments, is no longer considered

adequate. Unfortunately, the MMPI, and the MMPI-2 has been used routinely in

as African Americans. Some of the questions themselves were felt to be either offensive in the context of present culture, or inadequate to elicit accurate responses about the intended meaning of the question.

Some items were modified, some removed, some added. This was done with a more representative and current standardization sample. Another important improvement was the normalizing of the scoring distribution across all scales. T score elevations on any scale were made comparable to the same T score elevation on any other scale. This made comparing the relative patterns of elevation easier to plot and interpret in the context of the scores of all the scales. The cutoff score for interpreting what was a high score was set at a T Score of 65 for most scales. Several scales are considered interpretable with T scores below 45. Each of the MMPI-2 scales and subscales, other than the validity scales, is matched to a set of personality descriptors. Three additional validity scales were

used to adjust the T scores of five of the clinical scales for self deception in the

person's responses that may be covering negative aspects of the personality. Other

scales and subscales are used to aid in the interpretation of the clinical scales.

They are used in comparison to the non-k-corrected clinical scales. The choice of

which of the numerous additional scales to use in interpretation depends on the

purpose for which the MMPI-2 is being used. Forensic use of the test in custody

disputes, for example, may use different interpretive subscales than if the MMPI-

2 is being used as an employment or drug screening tool. The most commonly

used subscales in a general evaluation are the Restructured Clinical Scales,

Content and Content Component Scales, PSY-5 Scales, Supplementary Scales,

and Harris-Lingoes subscales.

CHAPTER II: LITERATURE REVIEW

Literature of Ayahuasca Research

A study of a sample of regular drinkers of the tea in the Uno De Vegetal

(UDV), a religion that uses the tea as a biweekly sacrament, has shown platelet

serotonin uptake sites increased in drinkers of ayahuasca by as much as 25%

(Callaway, Airaksmen, Mckenna, Grob, & Brito, 1994). No pharmacological

agent other than ayahuasca has been demonstrated to increase uptake site density

in platelets. This long-term physiological effect may indicate that ayahuasca

causes the body to adapt to more efficiently use its natural serotonin, thus

producing lasting benefit for depression. Grob, et al.'s study of long-term

ayahuasca users compared a group of 15 long-term users with 15 controls with no

prior use of ayahuasca. The study found remission from certain psychopathology

and substance abuse problems among the long-term users with no evidence of

reflection versus impulsivity (p <.1). No group differences were found along the spectrum of reserve versus extravagance (p <.514). Summation of all four spectrums of the novelty seeking domain identified a highly significant difference between the two groups (p <.0054). (Callaway, Airaksmen, Mckenna, Grob, et al, 1994, pg. 86-94) "

Analysis of the harm avoidance domain of the TPQ also identified significant differences between the two groups. The UDV experimental subjects were found to have significantly greater confidence versus fear of uncertainty (p <.043) with a trend toward greater gregariousness versus shyness with strangers (p <.067), as well as greater uninhibited optimism versus anticipatory worry (p < .098). Totaling the four spectrums of the harm avoidance dimension yielded a significant difference between the two groups (p < .011) (Grob, et al., 1996; Grob, 1999).

    The findings of the UDV study were obtained with instrumentation different than previous studies of psychedelic users, and care must be taken not to

Much of the subsequent research on ayahuasca has been focused on either the phenomenology of the experience itself (Shannon, 2002) or on mapping the brain activity of ayahuasca drinkers through use of an EEG. Hoffmann, Keppel, Hesselink, and da Silveira Barbosa (2001) recorded the EEG data from 12 subjects participating in a shamanic ayahuasca ritual in Brazil. After three doses of the tea, their EEG data showed statistically significant increases in alpha (8-13Hz) and theta (4-8Hz) mean amplitudes compared to baseline. The authors suggest that this effect is different from that of other hallucinogens, which tend to decrease alpha and increase beta activity; they also believe the ayahuasca state is more like the states causes by marihuana, which, like meditation, also stimulates the brain to produce more alpha waves. They further speculate that the state produced by ayahuasca is one of relaxed alertness that may give the drinker access to subconscious processes, thus making ayahuasca a useful

scale (HRC), the visual analogue Scale (VAS), and the addiction Research Center Inventory (ARCI) scale. It was found that the effects of ayahuasca were dose-dependent, stimulatory, and psychedelic. The researchers noted modifications of perception and rapid progression of thought, visions, and memories, often with emotional content. Five of the six subjects described their experiences as pleasant; one subject's experience was dysphoric. The subjective experience of ayahuasca was described as similar to intravenous injections of DMT, but at lower levels of intensity and of longer duration. The study also noted that any disorientation experienced during the experience was transitory, unlike other hallucinogens, which can cause cognitive distortions for prolonged periods.

Later in 2002, the study of the subjective tolerability of ayahuasca and its EEG effects was combined (Riba, et al.). These researchers concluded that the subjective effects of ayahuasca could be measured by EEG. They also found that

By this time the potential for the use of ayahuasca in treating drug addiction, which has mechanisms involving both serotonin and dopamine, was being recognized. Traditional healers had already been using ritual and ayahuasca to treat addictions to alcohol and other drugs for many years, and the study of these traditional approaches effectiveness was under way at the Takiwasi Center in Peru. The use of traditional healing rituals, which included ayahuasca, was reported as having benefited 62% of patients treated for addiction (Mabit, 2002).

Ritual use of ayahuasca was found to induce a reduction in minor psychiatric symptoms in a before and after study of outside participants in UDV and Santo Diame ayahuasca rituals (Barbosa, Giglio, & Dalgalarrroude, 2005). This study also raised the question of whether the setting and expectations of the participants—rather than the only ayahuasca itself—were responsible for the changes found. The researchers suggest that the importance of suggestibility in

Previous studies of the personality traits of hallucinogen users have been done using established test instruments. They have found that there is a significant difference in the personalities of hallucinogen users and normal populations (Heape, 1980). Heape's study compared the scores on 13 of the MMPI scales to the scores of users of other classes of drugs—namely central nervous system depressants, stimulants, opiates, and psychedelics. It was found that not only were there significant differences between drug users and population norms, but that each of the categories of drug use produced constellations of personality traits, based on the MMPI scales, that were different from each other as well. Each drug use classification had their own set of common mean differences from the norms established by the MMPI. This study also found that among the drug categories, hallucinogens caused the least significant differences from the normal mean scores for the MMPI scales, and that there were no differences on scales 1

66.30 (Clinical significance set at 65.) Scale 13 (Defensiveness) had a mean of 47.66, slightly lower than the established norms. This study establishes that abusers of psychedelics do have significant differences in scale scores on the MMPI, but that all the recorded differences fall within the normal nonclinical range, with the exception of scale 4, which is only slightly above the normal range of scores.

A similar study of personality and drug abuse categories was conducted at the University of Delaware (Carrol & Zuckerman, 1977). The MMPI and the Sensation Seeking Scale (SSS) were used to assess personality traits in users of hallucinogens, stimulants, or depressants. This study found significant positive correlation between psychedelic use and scale 1 (Hypochondriasis), scale 3 (Hysteria), scale 2 (Depression), scale 6 (Paranoia), scale 7 (Psychasthenia), scale 8 (Schizophrenia), and scale 0 (Social Introversion). These results contradict the

is correlated with manifest anxiety, the need for social stimulation, and seeking novel experiences. It did not find a correlation between hallucinogen use and Disinhabition as reported in the University of Delaware study. Another report from one of the primary researcher found the use of hallucinogens was significantly related to needs for novel or unconventional experiences and may indicate negative attitudes towards conventionally defined social values (Khavari, 1977). These findings correlate with high scores on MMPI scale 4.

If a set of personality traits can be identified for hallucinogen abusers, the question remains of whether those traits were in part caused by the use of hallucinogens, or were part of the user's personality profile prior to using hallucinogens. The National Institute of Mental Health used the MMPI to study students who later became heavy drug users as compared to students who did not. They found that profiles for both groups were well within normal limits, but had

The general profile that emerges from the research on hallucinogens and personality traits, based on points of agreement in the studies done, are that mild but not clinical elevations are expected on MMPI scale 2 (Depression), scale 4 (Psychopathic Deviance), scale 6 (Paranoia), Scale 7 (psychasthenia), and scale 8 (Schizophrenia). It has also been found that there is a moderate increase in reported anxiety, a need for social stimulation, and an increase in novelty seeking. All of these, however, seem to be within the normal range. The profile suggests a person who has more symptomology than normal, but not greatly so, who needs and seeks novelty in experience and social situations, who operates outside of the social norms, and has a hard time fitting in.

Keller and Redfering (1973) compared the personalities of 61 LSD users and 60 matched nonusers using the MMPI. They found:

88% of the users' MMPI protocols were judged abnormal as compared to 54% of the nonusers. In addition, the users mean scores were significantly

depression, obsessive-compulsive behavior, schizoid and schizophrenic behavior, social withdrawal and alienation, and anxiety, and increased scores on MMPI ego strength. Results indicated significantly greater improvement for the LSD groups, particularly the high-dosage group.

The two studies cited above illustrate a version of the conflict of ideas now emerging over the use of ayahuasca. The empirical information on LSD that was emerging when research was halted seemed conflicting, in that controlled use in therapeutic settings showed potential for the drug as a therapeutic tool, but the studies of individual users outside of controlled settings were not indicating overall benefits in correlational studies. Soskin (1973) assigned 21 psychosomatic and seven nonpsychotic psychiatric inpatients to two psychotherapy groups, one of which received five group LSD therapy sessions, the other five sessions with a placebo. Subjects were also seen twice a week for psychotherapy. After 18

betacarboline in ayahuasca, was the first antidepressant (Ott, 1996). It was used to treat tuberculosis in veterans' hospitals. It was noticed that depressed patients being treated with Harmine had a higher instance of remission from depression. Because of the danger of MAOI reactions, the betacarbolines were generally abandoned for safer antidepressants developed soon afterwards. DMT has undergone human tolerability tests and has had recent clinical trials to determine its mechanism of action. It has been shown that DMT is cross-tolerant with mescaline, psilocybin, and LSD (Strassman, 2001). This suggests similar mechanisms of action in the brain. It has also been reported that most people cannot distinguish between the effects of these drugs (Ott, 1996).

Much of the research on the biochemical action of ayahuasca comes from a limited number of interested researchers. I would consider the core group of researchers, who collaborate on much of the literature on ayahuasca

oxidase inhibition in the digestive tract, allowing the DMT, harmine, harmaline, and tetrehydroharmine to pass into the blood stream and eventually into the brain. Once there, all four act as serotonin agonists to increase the effect of serotonin inhibition of the GABA systems in the brain. Dopamine is elevated as well. The brain has two base neurotransmitters that regulate neuroactivity in any given area of the brain. One is GABA, which acts to inhibit brain activity, essentially the neurological braking system, and the other is glutamate, which provides both speed and excitation to post synaptic neurons, the accelerator pedal, so to speak (LeDoux, 2002, pp. 53-61). Serotonin and dopamine, both of which are used to regulate GABA act as modulators that attach to neuron gate receptor sites. This braking system is suppressed by the beta carbolines in ayahuasca, which increase levels of the two modulating neurotransmitters. This "takes the brakes off" neuroactivity in areas of the brain, especially in areas that use serotonin and

Rationale for the Current Research

Having looked at the basis for ayahuasca''s neurological action, we can

see that its basic action is that of a neuro-stimulant. Also, having looked at EEG

research on brain wave output, it can be seen that ayahuasca produces stimulation

within specific ranges of brainwave activity over wide areas, and tends to change

the hemispheric alternation of activity from rivalry to concurrent activity. There is

much speculation over what these effects may have on the personalities of the

drinkers, and although much of it seems to present careful speculation about

positive effect in the context of ritual use, there is an undertone of assumption that

the effects of ayahuasca are innately curative.

The traditional indigenous view of ayahuasca as seen through the current

western literature is that it is a healing medicine with many uses, and that it has

the power to produce profound positive changes. This view is, however, taken

investigations are focused on more modern and psychologically-minded concerns than the traditional cultures from which ayahuasca came. Ayahuasca is being investigated as a possible treatment for alcohol and drug abuse, and for an agent of general psychological growth and integration. These were not general concerns of the indigenous populations from which ayahuasca came.

The UDV investigation was the first to focus look at whether ayahuasca was in fact harmful to those who drink it physically, and to inquire into the state of the psychological health of those who drank it regularly, in this case in the context of the UDV in Brazil. That research study had as its context the question of harm, based on the conflict the UDV was having with the government of Brazil over ayahuasca use as a sacrament. The personality testing instrument used in the matched study, the TPQ, has also been used as a measure of serotonin activity in many research projects (Carver, C., Miller, C 2006), and was therefore ideally

to gain wider acceptance is a model based on scientific research and evidence outlining how its benefits are achieved. This is evidenced by the context in which much of the research is conducted. The general methodology has been to produce studies on subjects during or just after traditional indigenous shamanic rituals, or church-based rituals, during which they had consumed ayahuasca. The assumed context is that ayahuasca is a sacred medicine. The resulting data from the EEG studies is reported accurately, but the model of what the EEG shows brain activity to be is often inherently biased towards trying to prove ayahuasca is producing a possible positive effect. This inference is poorly supported by current functional understanding of brain activity. That an area of the brain has increased activity during an ayahuasca exposure is certainly measurable, but what that activity means is not; any more than listening to the magnetic field produced by a supercomputer can be translated into the complex lines of code running within it.

context. Although using a UDV North American population as a match to the South American study was attempted, their cooperation could not be obtained. It was possible to get ayahuasca drinkers from the general North American population to respond in sufficient numbers. The result is that participants in the current study have no common cultural belief system, other than what might be inherent in being a resident in North America. This population also removes the problem of what influence living within the UDV community itself may have had on the mental health and personalities of the studied UDV members in Brazil.

This study of the MMPI-2 responses of North American ayahuasca drinkers has a different context from previous research in that it is not reporting on the effects, tolerability, or potential medicinal value of the tea. It is looking at the personality characteristics through the responses of the participants as a group on the MMPI-2, making no assumptions about its action or medicinal value. It

Although the results will not be able to indicate causality between ayahuasca use and the ayahuasca-drinking subjects, it can produce information that shows correlations between responses of the subjects on the MMPI-2 and ayahuasca use as a group. This will help give direction to future empirical studies seeking to answer questions of the possible direct effects of ayahuasca on personality.

Research Objectives of the Current Study

1. Determine the mean pattern of personality traits of North American ayahuasca drinkers. This will be done by examining the ayahuasca drinkers mean T scores with the personality characteristics descriptors on the MMPI-2. This will also be determined by establishing a 2 point code of personality on the standard clinical scales, then using the personality descriptors from the MMPI for that code. Elevations in mean T scores will be evaluated by two criterions. The first

2. Determine if any of the groups' mean MMPI-2 subscales scores for alcohol or substance abuse show elevations. Ayahuasca contains four psychotropic substances. Repeated use may indicate a tendency for the group to use or be vulnerable to the use of drugs or alcohol. Previous research cited has stated that ritual treatment of alcohol and substance abuse with ayahuasca shows positive effects. The current study may shed some light on the addiction potential of current ayahuasca drinkers who have *not* participated in a ritually based rehabilitation program. This may produce suggestions for the direction of further study of the relationship of ayahuasca drinking itself and the therapeutic effect of suggestibility and ritual settings.

3. Determine if any significant differences exist in the patterns of response to the MMPI-2 between high and low ingestion drinkers of ayahuasca. If significant differences are found between mean T scores of these groups on the

for the study of ayahuasca drinkers may open empirical thinkers to considering

what is happening in traditional ayahuasca settings, and may offer traditional

ayahuasca practitioners a window into how empirical research might be of value.

CHAPTER III: METHODOLOGY

Design, Participants, and Procedure

Design

This is a quasi-experimental design. Subjects were not randomly assigned to conditions, and there were no measures to establish controlled conditions between independent and dependent variables. This was a nonequivalent control group design, in which the sampled group was already formed and no control conditions were applied. This was a post-test only design, sampling responses of ayahuasca drinkers after use was already occurring. Although the overall design is weak, it was the most viable design available in this situation, and has been used in the study of other drug using populations where pre-testing was not practical (Kazdin, 2003). This was a sample of convenience, consisting of responding ayahuasca drinkers. For this study the sample was however well suited for the

partially from personal impressions of the many ayahuasca drinkers I have met and the culture I perceive has developed around ayahuasca in North America. My impressions of the drinkers and culture have led me to be curious about specific personality characteristics that are spread across many of the MMPI-2 scales and subscales. Very little information is known about ayahuasca drinkers in North America. As of July 2006, the population of the United States was approximately 298.5 million people. Of these, perhaps only 6,000 have become frequent ayahuasca drinkers. Who are these people, and what types of personality traits might they have in common? Do they have personality traits that might indicate ayahuasca is being used as a drug of abuse? The current study will be a cursory examination of these questions using the MMPI-2.

In addition to the validity scales, I will now describe the additional scales and subscales chosen, and the reason for their inclusion.

Restructured clinical scales (RC).

After the re-standardization of the MMPI-2 population sample, the clinical scales had remained unchanged. It was recognized, however, that a new set of scales based on the new population sample might yield better validity. A large body of research and experience with the MMPI, as well as advancements in models of personality and pathology, had been made since the original population sample. This suggested that the clinical scales should be restructured accordingly. The RC scales developed are complementary to the clinical scales, not a replacement for them. The RC scales consist of:

RCd- dem- Demoralization- A measure of overall emotional discomfort.

RC1- som- Somatic Complains- Excessive preoccupation with bodily and health concerns.

RC2- lpe- Low Positive Emotions- Depressed, pessimistic, withdrawn,

RC7- dne- Dysfunctional Negative Emotions- Anxiety, irritability, unhappiness, helplessness, rumination, worry, over-sensitivity, guilt, intrusive thoughts.

RC8- abx- Aberrant Experiences- Hallucinations, bizarre perceptual experiences, delusional beliefs, impaired reality testing; scorers T65-74 may have schizotypal traits, and scorers >T74 may be psychotic.

RC9- hpm- Hypomanic Activation- grandiose, sensation seeking, risk-taking, poor impulse control, euphoria, excitation, decreased need for sleep, racing thoughts, and aggression. Scorers >T74 may be experiencing a hypomanic or manic episode.

My interest in the RC scales and ayahuasca drinkers was based on my overall impressions and experience of them as a group, and a single qualitative case study I conducted prior to choosing the MMPI-2 as this studies instrument. I

complaints, RC1, that may be useful in determining if ayahuasca drinkers as a group have aberrant or unusual thought processes.

The Butcher Item Content scales.

There are 15 new scales for the MMPI-2 that assess the client's obvious report of symptoms in several key areas that statistical analysis showed would "stick together" well. In other words, inter-item consistency is high for these scales. There is also some data from community samples that supports them, and studies show that they do add to the interpretations available from the test. They are not only based on pathology and thus offer some additional aspects to the test. They can be broken up further, but the scales seem to have adequate reliability and validity.

The Supplementary scales.

valid. For this reason, in clinical settings, tests of cognitive ability often precede the MMPI-2.

MMPI-2 Validity

The MMPI-2 is currently used in personality assessment in a wide variety of applications, including clinical diagnostic assessment, forensic evaluation, drug and alcohol screening, and personnel screening. The literature on the MMPI and MMPI-2 is extensive, probably in excess of 3,000 publications; this speaks to its wide usage and acceptance as an instrument to evaluate personality. It is currently the most frequently used personality tests in the United States, and is taken by as many as 15 million people a year (Bennett, 2004). It is the most researched and validated of all personality tests, with well over 2,200 published articles available about it (MMPI-2/MMPI-A Research Project 2006). Each of the MMPI-2 scales

Participants

Gender, Age, and Education

Gender: 15 of the participants were female, 19 respondents were male.

Age: Female respondents ranged from ages 32 to 59, the mean being 46.33 and standard deviation 8.56 (see Figure 1, Appendix).

Male respondents' age ranged from 22 to 57, with a mean of 43.47 and a standard deviation of 11.47 (see Figure 2, Appendix).

Education: The educational range of female participants was between 12 and 23 years of formal education, with a mean of 18.3 and a standard deviation of 3.54 years (see Figure 3, Appendix).

The educational range of male participants was between 12 and 19 years of formal education, with a mean of 15.26 and a standard deviation of 1.85 years (see Figure 4, Appendix).

Procedure

Data Collection

I have been in contact with individuals and groups interested in ayahuasca for five years, and have made contacts through conferences and academic circles with people who either drink ayahuasca frequently, or are interested in the effects of ayahuasca. Because ayahuasca remains illegal, and to ensure no harm came to individuals for their assistance in obtaining subjects for this study, contact records of individuals who helped obtain subjects, or became subjects themselves were not kept. Approximately 30% of the participants came from referrals by individuals directly by word-of-mouth. The criterion for participation was use of ayahuasca at least 10 times. In addition to these participants, I did a Google search on the terms *ayahuasca* and *yaje,* and contacted every available listing with a description of the study, requesting participants, and that word be passed to

Once requests were received, they were acknowledged by an email and a mailing address was requested if it had not already been provided. The participant was then sent a survey packet with instructions by mail. To protect the identity of the participants their contact information was purged from the computer before the mailing was done. For further security the survey packet had two consent forms. The first was signed and mailed back to the researcher to acknowledge the participant was fully informed of their rights as a research subject. This researcher's copy had no serial number on it that could be used to identify which data packet belonged directly to which consent form. Once the consent form was mailed back to the researcher it was separated from the client's responses, severing the link between their answers and their identities on the consent forms. A second copy of the consent form was retained by the participant. This participant's copy had the number of the survey materials matched to it, so the

Seventy requests for participation were received, and 70 survey packages were sent by mail. Of these, 35 were mailed back, all contained all of the test materials and consent forms. There was no further contact from the other 35 requests.

Validity Measures and Validity Checks

The MMPI-2 includes its own set of scales to measure the validity of the responses. As previously described in the introduction section, these scales are the VRIN, TRIN, F, FB, FP, L, K and S scales. These scales are needed because the tested person may have varied degrees of commitment to answering the test truthfully, having an interest in the test reflecting either health or pathology depending on circumstance. The person may also have cognitive or physiological problems that cause them to respond inconsistently, or motivational difficulties

is to some extent a decision made by the evaluator. High scores on a single scale do not necessarily invalidate a profile if the other scores are not elevated.

Mean Validity Scores—Female

The Mean Validity T scores for the female ayahuasca drinkers show no invalidating scores (see Figure 7, Appendix).

However, as can be seen in Figure 7, there were some elevations that indicated individual cases might have elevated profiles. Evaluation of all individual profiles indicated that they were valid.

Mean Validity Scores—Male

The mean Validity T scores for the male ayahuasca drinkers likewise showed no invalidating scores as a group, but some elevations of individual scales

was a more comprehensive instrument that made use of the TPQ redundant. The

TPQ responses were therefore not processed. The original proposal for this study

included only the analysis of the MMPI-2 validity and clinical scales, following

the pattern of previous studies of hallucinogen users done with the MMPI. Hand

scoring of the 35 responses was done for these scales, and found one invalid test

due to insufficient items answered. After the hand scoring had been done, I

received a grant to fund the study, and decided to order extended reports scored

by computer from Person Assessments, the publishers of the MMPI-2.

Respondent responses were transferred to computer scoreable answer sheets,

processed at Pearson, and then sent back by Federal Express. This yielded data on

the validity and clinical scales as originally intended, and the Restructured

Clinical, Content, Supplementary, PSY-5, Harris-Lingoes, and Content

Component Scales as well. This data was then transferred into SPSS for analysis.

clinical or forensic settings. This study included neither, and participants were

expected to follow the instructions on the examination booklet. The individual's

identities were not associated with the data collected.

CHAPTER IV: RESULTS

The Use of T Scores and the MMPI-2

All scales of the MMPI-2 convert raw response data into T scores that are

based on the responses of the standardized sample. Different conversion tables

and values are used for male and female profiles. A T score of 50 is considered

average as compared to the standardized population sample that represents the

general non-clinical population. The higher the T score on any given scale the

more the responses of the individual profile statistically resemble the responses of

a clinical population on that scale, in short, the higher a score the more likely the

person's responses are like those of people who have a diagnosable problem

involving the concept the scale represents. A scale T score is generally considered

high at a score of T=65, but elevations on any individual scale are not considered

sufficient to indicate diagnosable pathology. It is the combinations of elevations,

Clinical Scale Results

Female

Mean T scores for the clinical scales of female profiles found moderate elevation on scale 3 (Hysteria). I consider the score of 54.93 to be reasonably close to the low moderate determination score of 55 to warrant inclusion as a moderate score (See Figure 9, Appendix).

Individual profile analysis showed one case with a high T score of 82, and one with a high T score of 65. Two had moderate scores of 56 and 58 respectively (See Figure 10, Appendix).

Male

Mean T scores for the clinical scales of males found moderate elevations on scale 3 (Hysteria) scale (see Figure 11, Appendix).

The individual elevation on the clinical scales for both females and males

do not appear to be extreme enough to warrant the removal of any individual

cases from the study for their distorting value. Profiles with high and moderate

scores appear to be within the normal range of responses overall.

Non-K-Corrected Clinical Scales

Female

K is one of the validity scales, a fraction of which is added to several of

the clinical scales to compensate for self deception. The non-K-corrected Mean T

scores for the female profiles showed no high T score profiles or moderate T

score profiles. (See Figure 15, Appendix.)

Male

The non-K-corrected Mean T scores for the male profiles showed no high

restructured accordingly. The result was the RC scales. They are complementary

to the clinical scales.

Female

The mean T scores of the female profiles on the restructured clinical scales

shows moderate elevations on scales RC4 (Antisocial Behavior), scale RC6 (Ideas

of Persecution), and RC8 (Aberrant Experiences). (See Figure 17, Appendix.)

Female RC4 Individual Profile Scores

Individual T scores for female profiles on the RC4 scale show two high

scores at 69 and 66, and seven moderate level T scores (see Figure 18, Appendix).

Female RC6 Individual Profile Scores

Male

The mean T scale scores for the Restructured Clinical scales for male

profiles shows moderate elevations on scale RC4 (Antisocial Behavior), and scale

RC8 (Aberrant Experiences). (See Figure 21, Appendix.)

Male RC4 Individual Profile Scores

The individual T score profiles for RC4 for males show one very high T

score of 83, one of 68, and another of 65. There are also five moderately elevated

T scores on this scale. (See Figure 22, Appendix.)

Male RC8 Individual Profile Scores

The individual T score profiles for RC8 for males show six cases of high

elevations, one at T=80, three at T=70, two at T=66. There are also 10 profiles

show that they do add to the interpretations available from the test. They are not

only based on pathology and thus offer some additional aspects to the test.

Female

The mean T scores of the female profiles on the content scales shows one

moderate elevation on the BIZ, Bizarre Mentation Scale (see Figure 24,

Appendix).

Female Biz Scale Individual Profile Scores

The individual T score profiles for the female BIZ profiles show one very

high T score elevation of 76, and nine profiles with moderate elevations (see

Figure 25, Appendix).

Male

The Supplementary Scales

These scales cover numerous areas such as Over-controlled Hostility, Anxiety, Ego Strength, and Repression, signs of PTSD, Addiction Acknowledgment and Addiction Potential.

Female

The mean T scores of the female profiles on the Supplementary Scales shows four moderate elevations, on the R (Repression), O-H (Overcontrolled Hostility), AAS (Addiction Admission), and GM (Gender Role Male) Scales. (See Figure 28, Appendix.)

Female R Scale Individual Profile Scores

The individual T score profiles for the female R scale profiles show four

Female AAS Scale Individual Profile Scores

The individual T score profiles for the female AAS scale profiles show

five very high T scores of 73, 67, 67, 67 and 67. There were also three profiles

with moderate elevations. (See Figure 31, Appendix.)

Female GM Scale Individual Profile Scores

The individual T score profiles for the female GM scale profiles show two

very high T score elevations of 69 and 67. There are also six profiles with

moderate elevations. (See Figure 32, Appendix.)

Male

The mean T scores of the male profiles on the Supplementary Scales

shows moderate elevations on the on the R (Repression), O-H (Overcontrolled

Male O-H Scale Individual Profile Scores

The individual T score profiles for the male O-H scale profiles show five profiles with very high T scores of 72, 72, 69, 65, and 65. There were also eight profiles with moderately elevated T scores. (See Figure 35, Appendix.)

Male AAS Individual Profile Scores

The individual T score profiles for the male AAS scale profiles shows five profiles with very high T score elevations of 80, 70, 65, 65, and 65. There were also eight profiles with moderate T score elevations. (See Figure 36, Appendix.)

The PSY-5 (Personal Psychopathology Five) Scales

The PSY-5 scales were developed from studies of personality disorders and normal personalities and cover five broad domains relevant to clinical planning and communication. They provide an overview of major personality

individual cases having an undue effect on the mean T scores. (See Figure 37, Appendix.)

The PSYC Individual Scale Score Profiles

The individual T score profiles for the female PSYC scale profiles shows two clinically significant profile T scores of 78 and 66. There are also five profiles with moderately elevated T scores. (See Figure 38, Appendix.)

The DISC Individual Scale Score Profiles

The individual T score profiles for the female DISC scale shows two high T scores of 66 and 66. There were also five profiles with moderate elevations in T scores. (See Figure 39, Appendix.)

The PSYC Individual Scale Score Profiles

The individual T score profiles for the male PSYC scale profiles shows four high T scores of 68, 68, 65 and 65. There were also seven profiles with moderate elevations in T scores. (See Figure 42, Appendix.)

The Clinical Subscales (Harris-Lingoes Subscales)

The Harris-Lingoes Subscales group some of the clinical scale items into content homogeneous subscales that are intended to be of assistance in interpreting the parent clinical scales. Some of these subscales have very few endorsement items and for this reason the scales are interpreted independently of the parent scale. Items are also only interpreted when both the parent scale and subscale have a T score greater than 64.

Female

The Content Component Scales

The Content Component Scales have been constructed through empirical analysis to identify meaningful content themes in the parent Content Scales. These are used to assist in the interpretation of the parent scales. The Content Component subscales are only interpreted when the parent Content Scale has a T score of 60 or greater and the Content Component Subscale has a value of T=64 or greater.

Female

The mean T scores of the female profiles on the Clinical Scales showed no Mean T score elevations high enough to interpret. Likewise, the Content Component Subscales showed no mean T score elevations high enough to interpret. (See Figures 45 and 46, Appendix.)

personality characteristics, but descriptions of how closely characteristics resemble known concepts of pathology described by the various scales and subscales. In order to understand the personality characteristics of ayahuasca drinkers, we will first look at the descriptors from the MMPI-2, then from the MMPI, which has a code system for normal personality traits.

Descriptors from the MMPI-2 Manual Clinical Scales

The mean T scores for the entire group Clinical Scales, female and male are indicated in Figure 47 (Appendix).

Mean T Scores Spikes on Cinical Scales

The groups mean T scores create peaks on scale 5, scale 6, and scale 3, giving the group a mean code profile of 5-6-3. The difference between the mean T

be overly sensitive, guarded or distrustful, possible angry or resentful. However, the threshold for this moderate score is 55, a less than one point elevation into the moderate range. The clinical scales T score values are considered a continuum, with higher scores making it more progressively likely the person has the described characteristics, rather than a particular T score being a threshold point. In this case the mean T score of 55.62 would have to be considered at the low end of the moderately elevated continuum, therefore the personality descriptors would also have to be considered as representing low moderately elevated scores. The scale 3 mean T score of 55.38 is again at the low end of being a moderately elevated score. It implies some degree of somatic complaints, denial, immaturity, self-centeredness, that the personality may be demanding, suggestible, and prone to a need for affiliation.

Male mean T personality descriptors indicate a profile code of 5-6-4. The

Female mean T personality descriptors indicate a profile code of 3-6-5. The mean T score of 54.93 if rounded up to 55 on scale 3 indicates the personality may experience somatic complaints, denial, and immaturity, self-centeredness, that the personality may be demanding, suggestible and prone to a need for affiliation. If rounded down to 54 there is no interpretation. The mean T score of 53.47 on scale 6 has no interpretation. The mean T score of 53.2 on scale 5 also has no interpretation.

Common then to the group, the males, and the females, are mean T scores on the Clinical scales that imply low-moderate somatic complaints, denial, immaturity, self-centeredness, and that the personality may be demanding, suggestible and prone to a need for affiliation, with males being possibly being more unconventional, immature, self-centered, having more superficial relationships, being more extroverted and energetic.

score of 57, may be interpretable as possibly unconventional, immature, and self-centered, may have superficial relationships, and is extroverted and energetic. (See Figure 48, Appendix.)

The female modal T scores show a modal profile code of 3-5-6. The Mode T score on scale 3 of 54 is not interpretable. The mode T score on scale 5 of 52 also has no interpretation. The mode T score for scale 6 of 49 has no interpretation. (See Figure 49, Appendix.)

The male modal T scores show a modal profile code of 5-4-3. The Mode T score on scale 5 of T=60 is not interpretable. The mode T score on scale 4 of T=57 is a moderate elevation possibly interpreted as unconventional, immature, self-centered, may have superficial relationships, is extroverted and energetic. Mode T scores on scale 3 of T=52 is not interpretable. (See Figure 50, Appendix.)

MMPI-2 personality descriptors indicate that as a group, the ayahuasca

Restructured Clinical Scales (RCS)

As a group, ayahuasca drinkers show no high elevations on the RCS. There are two moderate elevations, one on RC4 (Antisocial Behavior) with a mean T score of 56, and a second on RC8 (Aberrant Experiences) with a mean T score of 58.52. RC4 elevations may indicate difficulty conforming to societal norms, aggressiveness, antagonism, argumentativeness, tendency to lie, cheat, act out, substance abuse, family conflicts, and poor achievement, possibly due to demoralization. RC8 elevations may indicate delusional beliefs, bizarre perceptual experiences, or impaired reality testing. (See Figure 51, Appendix.)

The female ayahuasca drinkers had similar mean T score elevations on RC4, mean T=56.33, and RC8, mean T=55.53. This would indicate similar moderate characteristics to the male sample on these scales. The female sample

showed any high mean T scores on the Content scale. The highest mean T score

for the males was 58.42, for the females 56.53. Both were on the BIZ scale.

Because the Content Component Scale descriptors are based on the elevations of

the Content Scale, the Content Component Scale is also not interpretable. (See

Figure 52, Appendix). I will, however, report the Mean T scores of the Content

Component scales without interpretation for academic curiosity. There are no

elevations above T=53.82, which appears on the SOD1 (Introversion) scale. The

highest male mean T score, T=55.84, was on the BIZ2 (Schizotypal

Characteristics) scale. The highest female mean T score, T=54.13 was on the

FAM2 (Familial Alienation) scale. (See Figure 53, Appendix.)

Supplementary Scales

All Supplementary Scales are considered to have high elevations at a T

score of 65 or greater; some have descriptors for low scores and some do not. The

indicate moderate histories of acting out behaviors, impulsivity problems, family

problems, and may be critical, angry or aggressive. (See Figure 54, Appendix.)

Both male and female samples showed similar moderate elevations on

Supplementary scales R, O-H and AAS. The female sample also showed a

moderate elevation on GM (Gender Role-Masculine), mean T=55. This may

indicate a moderate increase in descriptors for stereotypic male interests, denial of

fears and anxieties, and increased somatic complaints.

PSY-5 Scales

All PSY-5 Scales are considered to have high elevations at a T score of 65

or greater. There are no High T score elevations on the combined male and female

sample. There is one moderate elevation greater than T=55, the PSYC

(Psychoticism) scale, with a mean T score of 55.41. This scale assesses

less traditional. There may be a tendency to be easily bored with routine. A moderate elevation on the INTR scale may indicate a tendency toward depression, anxiety, pessimism, introversion, and a decreased ability to experience joy.

Harris-Lingoes Subscales

These further breakdowns of the individual clinical scales are not interpretable separate from their parent clinical scales, which should be greater than T=64. This requirement has not been met for any of the clinical scales. In addition, the individual Harris-Lingoes subscales must also have a T score greater than 64 to be interpretable. This requirement is also not met. I will, however, look briefly at the combined male and female mean T scores for these scales out of academic curiosity.

Five elevations above T=55 are seen on the subscales, Hy2 (Need for

Results for MMPI-2 Personality Characteristics Descriptors Profile

Taken together, the inferences about the combined male and female ayahuasca drinkers scores are consistent and present a picture of a sample group that responded in a valid manner. They are not very likely to be maladjusted and are likely to have the psychological resources needed to meet life's demands. The same can be said for the male and female groups independently. As a group there is a low-moderate response consistency with persons who may have somatic complaints as the result of overcontrolled hostility resulting from the repression of aggression, may not conform to social norms, have some unusual beliefs, and have some unconventional experiences and thought processes. There may be some risk taking and internalizing behaviors. They appear unlikely to be sufficiently distressed to seek or remain in treatment.

reactive depression, paresthesia, religious preoccupations, but have intact thought processes.

Addiction Sensitive Scales Scores

The MMPI-2 is one of the most widely used drug and alcohol assessment tools. Within the clinical scales Pd (Psychopathic deviate), D (Depression), and Pt (Psychasthenia) have most appeared to be associated with alcohol and drug use problems (Gallucci, N 1997). Special scales have also been empirically derived for the assessment of addiction potential, these are the MAC-R (MacAndrew Alcoholism-Revised), AAS (Addiction admission scale), and the APS (Addiction Potential Scale). Looking at this combination of scales we find no high scores, and one mean T score above 55, on the AAS scale. The responses of the ayahuasca drinkers do not have a high correlation with the scores of drug and

with the data at hand. The mean number of ayahuasca ingestions for the group was 63.17. The range of the number of ingestions was from 10 to 600 times. The mean number of ayahuasca ingestions for the low users group was 55. The mean number of ayahuasca ingestions for the high users group was 260. Using the mean number of ayahuasca ingestions to divide the sample into a high use group and a low use group, a mean T score for high use and a mean T score for low use was then calculated for each of the clinical scales. This showed significant differences between high ingestion drinkers and low ingestion drinkers on scale 1 Hy, scale 7 Pt, scale8 Sc, scale 9 Ma, and scale0 Si. All of which showed decreases in mean T scores. (See Tables 1, 2, 3, 4, and 5.)

Table 1

High-low Use T-test Scale 1.Hs

One-Sample Test

Table 2

High-low Use T-test Scale 7.Pt

One-Sample Test

Test Value = 45.17

					95% Confidence Interval of the Difference	
					Lower	Upper
Scale7.Pt	3.798	27	.001	5.97286	2.7463	9.1994

Table 3

High-low Use T-test Scale 8.Sc

One-Sample Test

Test Value = 49.67

95% Confidence Interval of the Difference

Table 5

High-low Use T-test Scale 0.Si

One-Sample Test

Test Value = 42.5

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Scale0.Si	2.289	27	.030	4.50000	.4661	8.5339

Because none of these scales had highly elevated mean T scores before

this comparison, all that can be done here is state the results without coming to

any conclusion about the actual effects of ayahuasca on personality descriptors. In

looking at the comparison, it should be kept in mind that scores that mean T

scores that are lower for the high ingestion group than for the low ingestion group

Dividing the Supplementary Scales in the same way and T testing the high and low mean T scores of the groups found five scales with significant differences; MDS (Marital Distress Scale), AAS (Addiction Admission Scale), APS (Addiction Potential Scale), and the GF (Gender Role Female) Scale. There was a decrease in the mean T score on the MDS of T=4. There was an increase in the mean T score on the AAS of T=4. There was an increase in the mean T score on APS of T=4. There was a decrease in the mean T score on scale GF of T=8. (See Tables 6, 7, 8, and 9.)

Table 6

High-low Use T-test MDS

One-Sample Test

Table 7

High-low Use T-test AAS

One-Sample Test

Test Value = 61

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
AAS	-2.122	27	.043	-3.53571	-6.9546	-.1168

Table 8

High-low Use T-test APS

Table 9

High-low Use T-test GF Scale

One-Sample Test

Test Value = 41

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
GF	3.217	27	.003	7.96429	2.8838	13.0448

Dividing the PSY-5 scales in the same way and T testing the high and low means

of the group found three scales, AGGR (Aggression), NEGE (Negative

Emotionality/Neuroticism), and INTR (Introversion/Low Positive Emotionality)

to have significant differences between the high and low consumption groups.

There was a decrease in the mean T score on the AGGR Scale of T=4.29. There

Table 10

High-low Use T-test AGGR Scale

One-Sample Test

Test Value = 041.5

| | | | | | 95% Confidence Interval of the Difference | |
					Lower	Upper
AGGR	2.902	27	.007	4.28571	1.2556	7.3158

Table 11

High-low Use T-test NEGE Scale

One-Sample Test

Table 12

High-low Use T-test INTR Scale

One-Sample Test

Test Value = 57.33

					95% Confidence Interval of the Difference	
					Lower	Upper
INTR	-2.323	27	.028	-3.79429	-7.1457	-.4429

Finally, if we look at Figure 58(see Appendix), all the significant

differences found between low and high ayahuasca consumption groups in the

sample, we begin to get a sense of what correlation there may be between

ayahuasca use in general on the scales of the two groups. Keeping in mind that in

a very general sense low scores on the scales are associated with not being

Table 13

High-low Use Groups T-test of Mean T Scores

One-Sample Test

Test Value = 49.54

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
highmean	-1.052	1	.484	-25.39500	-332.1863	281.3963

Summary of Results

None of the mean T scores for the scales of the MMPI-2 show high

elevations for either males or females amongst the ayahuasca drinkers. For female

drinkers mean T scores at or above 55 were found on scales Hy. (Hysteria), RC4

(Antisocial Behavior), RC6 (Ideas of Persecution), RC8 (Aberrant Experiences),

Pd2.(Authority Problems), Pd3.(Social Imperturbability), Pa2.(Poignancy), Pa3

(Naivete), Sc3 (Lack of Ego Mastery; Cognitive), and BIZ2 (Schizotypal

Characteristics).

    The following scales had mean T scores above T=55 for both male and

female ayahuasca drinkers: Hy (Hysteria), RC4 (Antisocial Behavior), RC8

(Aberrant Experiences), BIZ (Bizarre Mentation), R (Repression), O-H

(Overcontrolled Hostility), AAS (Addiction Admission), and PSYC

(Psychoticism).

CHAPTER V: DISCUSSION

Evaluation of MMPI/MMPI-2 Results

Care must be taken whenever comparing groups for significant differences using multiple measures, such as the over 120 scales of the MMPI-2. The chances of experimentwise error, finding at least one significant difference between the ayahuasca drinkers and the standardization sample was 99.82%. The MMPI-2 results obtained for the sample indicate low probabilities of similarities between the responses of the sample participants and people with clinical symptoms. To put it as simply as possible, the ayahuasca drinkers are "normal", with no statistical difference between them and the standard population sample. The MMPI scale spike personality codes also indicate the ayahuasca drinkers responses can best be described as "normal." The statistical chance of finding at least one statistical difference on 12 scales for the Hi-lo use group comparison

professional in forming a more complete picture of a personality and it's

functioning, not a replacement for that trained human, evaluation. That evaluation

must include the context of the respondent's situation, as much as can be known

about them at the time the evaluation is made, what experiences may be affecting

them at the time of the evaluation. This living context does not invalidate a profile

because it explains aspects of it, it gives a deeper understanding of personal

experience and processes, and of the personality involved. I have met and spoken

with several hundred ayahuasca drinkers over the past five years, and believe that

the scores seen on the MMPI-2 scales of this study are probably an accurate

reflection of them as a group. I see the moderate elevation on scale 3 (Hysteria)

for this group as reflecting perhaps a denial of problems in one's life and a denial

of social anxiety, rather than the somatic complaints, immaturity, self

centeredness, or demandingness from the descriptors. Their low scores on scale 0

culturally curious, regardless of their formal educational level, and do tend to be tolerant and liberal in their attitude.

The moderate elevation on scale 6 (Paranoia) seems to coincide with my experience of ayahuasca drinkers only with respects to the descriptors of being overly sensitive and guarded. This however is complicated by having what they often consider to be their spiritual path, right to self exploration, and to some extent chosen social activity, leading to the possibility of arrest and prosecution by authorities. Is it paranoia if they really are out to get you? In terms of the MMPI-2 endorsement of items relating to this scale, it does not distinguish between real and imagined concerns. I have also encountered many ayahuasca users with career positions and families they wish to protect from the possible consequences of legal action resulting from their involvement with ayahuasca. This has often given me the impression that they are guarded. This scale has items

(Hostility) scale seems to be a match for my experience of ayahuasca drinkers as generally friendly people with little generalized hostility. Low scores on the Si (Social Introversion) scale would also seem to support this.

I find the Addiction related scales of the Supplementary Scales, the MAC-R, AAS, and APS scales particularly interesting for ayahuasca users. Ayahuasca is clearly a drug, yet is often referred to by drinkers as sacrament or medicine. The scale scores spikes do remind me of the sense that ayahuasca drinkers seem to both have a low potential for actual addiction, and keep a realistic concern over their own use in their minds.

My personal impressions of ayahuasca drinkers compared to the PSY-5 scales, which also found no high mean T scores, also follows the general visual impression of the line graph for these scales. Ayahuasca drinkers seem to me to be a bit less aggressive than average, this seems to follow along with an

generally slightly more functional than the general population, a finding also reflected in the UDV study.

This brings me to the last, and for me most interesting question surrounding ayahuasca: what effect is it actually having, if any, on the personalities of the people drinking it? I had hoped that a comparison of this studies result could be compared to previous MMPI studies of hallucinogen users. I believed ayahuasca drinkers would probably have similar scores, elevations on the same scales, but none considered high. The previous studies of hallucinogen users turned out to be populations too different from the sample gathered of ayahuasca users to compare. Although disappointing, this did allow a perspective on ayahuasca drinkers to develop that did not include assumptions and comparisons to other groups, and I am grateful to my chairperson for her assistance in helping me with this realization. When the bulk of the profile data

more clarity would be found in the MMPI personality description for the

ayahuasca group, but there too "normal" and "not interpretable" seemed to be the

presented answers. Having been disabused of the notion that the MMPI and

MMPI-2 can be used as a diagnostic cookbook, I tried to look at these differences

of five or more mean T score from T=50 on each scale to form a sense from my

experience of what personality characteristics I have observed, keeping in mind

the lack of high elevations. This has of necessity required me to consider the

social context the ayahuasca users find themselves in.

Differences between High and Low Ingestion Drinkers

The question of any effect of ayahuasca on personality that might be

inferred from splitting the group into high and low ingestion users did show there

are significant differences between the groups on twelve of the MMPI-2 scales.

complains less; this may relate to the lowering on Scale 1 (Hs). I concur with the

lower scores on Scale 7 (Pt); more frequent drinkers give me the impression of

having fewer fears and worries about their abilities, and appear to have no

problems concentrating. This would also be in line with the UDV study findings.

My feelings about the decrease on scale 8 (Schizophrenia), are somewhat more

complicated. I do not perceive high frequency drinkers as having the problems

with concentration and feelings of personal alienation associated with

schizophrenia, nor do any of my observations or the data from this study support

serious impulse control problems or high levels of bizarre mentation. However,

the belief systems that seem to develop in the individuals of high use I have

known would be considered by mainstream culture as eccentric at the very least.

Ayahuasca is legendary for its use to open the mind into a world of spirits and

supernatural beings, where psychic powers and archetypal magic of all

My observations have lead me to believe ayahuasca may help drinkers become more suggestible to whatever they tell themselves, to make them auto-suggestive to some degree, reinforcing their own beliefs. It also appears to me that all ayahuasca drinkers I have spoken to entered into the experience with the expectation and intention of it being a healing experience with mystical aspects. It is possible that once that expectation is reinforced by an ayahuasca experience, it sets the tone and path for the rest of the following experiences. Yet, unusual beliefs are not sufficient cause to diagnose a disturbance of mental process, and the high-consuming ayahuasca users have a lower, not higher mean T score on scale 8. I have noticed this group tends to be more concrete and somewhat literal in their thought processes than the population in general. This would correspond with some aspects of a low scale 8 score, as well as the results of the UDV study.

The decrease on scale 9 Ma (Hypomania) has no direct descriptors I can

On the significant findings on the supplementary scales, I have no

knowledge or experience useful in evaluating the MDS (Marital Distress Scale). I

haven't met many high use ayahuasca drinkers that use other drugs with any great

frequency, so the rise on the AAS (Addiction Admission Scale) is a little

puzzling. Perhaps the recognition that their ayahuasca use is frequent raises

concerns for them. The rise on the addiction potential scale of high use ayahuasca

drinkers seems to make sense, despite their general belief that ayahuasca is more a

cure for addictions than an addiction itself. They are after all taking a drug

frequently in order to be considered part of this group. The GF (Gender Role

Feminine) scale shows the largest difference of any of the scales between high

and low sample users of ayahuasca, an eight point lowering of the mean T score.

The GF and GM (Gender Role Male) scales are difficult to interpret and there is

very little validity data on them. My experience would agree with aspects of the

that ayahuasca drinkers had a more stoic personality than the controls in their study. Very frequent drinkers I have met seem to me to have a solid and self-assured aspect to their personalities.

The PSY-5 scales showed significant differences between high and low ayahuasca drinker group mean T scores on three of the scales. The decrease on the AGGR (Aggression) scale is impossible for me to evaluate, as I have not seen demonstrations of aggression in persons of either group. I have an impression of low aggression in ayahuasca users in general. Similarly, my interpersonal contact with ayahuasca drinkers in general has not been sufficiently personal to distinguish differences on the NEGE scale, other than to say that as the mean T score infers, they do not appear to have elevated levels of negative emotionality or neurosis. Similarly, I have no evaluation to add about the INTR scale, other than the mean T score indicating that neither group has highly elevated scores seems

Having had such experiences, how then does a person communicate them to their

social contacts that have no point of reference for such experiences? One might

experience a small sense of social anxiety, even if they were gregarious by nature,

perhaps a small guardedness over talking about the experiences to those who

might not understand and become judgmental. This might also result in a bit of

self-centered or internalizing concerns and repression of social aggression

because of the belief that their perspective is now somewhat different for their

ayahuasca experience, and that there is a need to manage their social frustration

over the inability to communicate and share the experience with their general

social environment. My own current opinion about ayahuasca is it causes neither

abnormality nor normality by its use, regardless of frequency, is neither

significantly innately therapeutic nor detrimental in general use with regards to its

effect on personality, and that most of what is believed about it and experienced

setting. There was also no face to face structured clinical interview with the respondents to compare the responses on the MMPI-2 to. The sample size, N=34, was sufficient as a collective group, but when divided by gender both resulting groups has less than the N=30 that would meet the power requirements for the study. This problem was also present in the division and comparison of the mean T scores of the high and low users, with the high users sample being only N=6. Although this comparison did find significant results, the possibility of type II errors remains high.

Every psychedelic study has had to contend with two primary confounding variables. These are based on the prior conditions and experiences of the participants i.e., many participants have prior mental health conditions, including personality disorders that may have pre-existed their use of psychedelics. These traits may have influenced their decision to become involved in psychedelics in

alone. In this study, as in the previous ones, the procedure is to report this problem as a limitation of the study for the reader's consideration.

Conclusion

The mean T scores of the group on the MMPI-2 descriptors produce a profile without high elevations. The resulting mean profile could best be described as within normal limits of personality. The personality characteristics produced by the 2-point coding system of the MMPI also produces a description best described as within normal limits. There are no indications of high addiction potential for the sample group. Dividing the sample group by mean number of uses into high and low use groups and comparing the means for the MMPI-2 scales of each group did produce some statistically significant findings, but all were within normal ranges of personality.

virtually any curious person, of any age, makes the study of ayahuasca and its effects, both physical and psychological, worthy of study as a matter of public physical and mental health as well as any social effects wider general use in the population may have.

Suggestions for Further Research

There remains the possibility that ayahuasca is having a measurable effect on the personalities of its drinkers beyond the suggestibility of the setting and expectations within which it is used. The determination of this possible effect would require research methodology similar to that used to determine the effects of any other psychotropic medication, in experiments specifically designed to separate out the effects of variables such as the placebo effect. The current situation makes such research very difficult. Money to seek approval for such

seasonal and genetic differences that make no ayahuasca exactly like another. In settings where traditional shamans have been used to brew the tea before EEG readings were done, little mention is made of the fact that each shaman or ayahuasqueros uses their own formula for the proportions of the plants used, and the contents of the ayahuasca may in the end have considerably different ratios of the betacarbolines to DMT than previous research attempts at measurement of EEG effects.

The question of the effects of ritual and suggestibility, aside for the variable of ayahuasca content, may be possible to research at this time. Within legal context, one of the centers where ayahuasca is currently used in ritual settings, or where rehabilitation research is being done, could conceivably set up before and after conditions for ayahuasca subjects. For example, one of the ayahuasca churches could request volunteers who are entering their rituals for the

religious use. Further research could also be done with long-term drinkers of these groups, tracking them yearly over a long period of time to see if any common psychological or physical conditions are found.

Perhaps the most useful information about the effects of ayahuasca would be gained by researching its effects on a population of volunteers who have been pre-screened with psychological tests and interviews, generally educated and informed about ayahuasca through a standardized program, then given ayahuasca in a supervised but as symbolically neutral environment as possible several times. Support services would be maintained for the study group, and an after ayahuasca set of tests and interviews could be done. This might show not only what effects on personality ayahuasca had in a neutral setting, but if the person's own beliefs and expectations were changed or enhanced by the experience.

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