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ASSESSING NOVEL EXPECTANCIES ABOUT AYAHUASCA: A PRELIMINARY REPORT

by

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Abstract

Given the growing popularity of Ayahuasca, we sought to identify why people might use this psychoactive brew rather than classic hallucinogens like LSD or psilocybin. Experienced users (N=139) completed an online survey about their use of hallucinogens, including ayahuasca, how their ayahuasca experiences differed from those with other hallucinogens, and their willingness to use ayahuasca over other hallucinogens in the future. Participants reported meaningful differences between ayahuasca and other hallucinogens, which apparently related to positive connections to nature and other people, dramatic or terrifying negative thoughts, and aversive physical reactions. Multiple measures of self-reported likelihood of using ayahuasca again increased as positive connections increased but decreased as aversive physical reactions increased. A global score of items from the scale significantly covaried with individuals’ likelihood of using ayahuasca over other hallucinogens. These findings suggest unique qualities of ayahuasca and its effects compared to other hallucinogens, which might impact an individual’s willingness to try the substance again. Future studies might expand upon this finding by exploring individual factors that may impact ayahuasca experiences and likelihood of future use. Comparable approaches could also identify unique aspects of other hallucinogens to see if those attributes help predict a preference of one over others.

Keywords: ayahuasca, hallucinogens, expectancies
Introduction

Psychedelic substances, such as lysergic acid diethylamide (LSD), psilocybin, and peyote, are well-known for their subjective effects. These drugs, otherwise known as “hallucinogens”, induce altered states of consciousness and often promote mystical, and potentially life-altering experiences via their interaction with the serotonin neurotransmitter systems (Glennon, Titeler, & McKenney, 1984; Jacobs, 1987). Some of the most common effects of these substances include heightened awareness of one’s self and one’s surroundings, increases in emotionality, and transcendental experiences, in addition to physiological changes, such as pupil dilation, dizziness, and loss of appetite (Grinspoon & Bakalar, 1983). Not all users will undergo the same effects, potentially due to the impact of set and setting (Leary, Litwin, & Metzner, 1963). The influence of “set” suggests that attributes specific to the individual, such as his or her attitude, personality, beliefs, and motivations for ingesting a substance, might affect the drug-ingestion experience. Similarly, “setting”, or an individual’s surroundings while using the substance, can also play an important role. The impact of set and setting, in combination with individual differences and varying doses and potencies, suggests that users taking substances within this class might experience vastly different subjective phenomena.

For thousands of years, individuals have been ingesting hallucinogens for consciousness-altering intentions (Wasson, Kramrisch, Ott, & Ruck, 1986). Early use of hallucinogenic substances in ancient societies probably served mainly religious purposes (Carod-Artal, 2015). However, in contemporary society, individuals might use these drugs for other intents. In fact, as of 2010, approximately 32 million Americans used LSD, psilocybin, mescaline, or peyote in their lifetimes (Krebs & Johansen, 2013). Moreover, lifetime hallucinogen use in the United States has increased since 2001, possibly due to the amplified curiosity about this class of
substances (Shalit, Rehm, & Lev-Ran, 2019). While many individuals use these substances recreationally, new research reveals clinical utility of these drugs in treating depression, anxiety, posttraumatic stress disorder (PTSD), and substance use disorders (Bogenschutz & Johnson, 2016; Carhart-Harris et al., 2016; dos Santos, Bouso, Alcázar-Córcoles, & Hallak, 2018; Mithoefer et al., 2018; Morgan, McAndrew, Stevens, Nutt, & Lawn, 2017; Ot’alora et al., 2018; Ross et al., 2016; Rucker, Jelen, Flynn, Frowde, & Young, 2016). These recent findings call for an in-depth exploration of individual substances within this class of drugs.

**Ayahuasca**

Ayahuasca is a tea with psychoactive properties derived from the plants *Banisteriopsis caapi* and *Psychotria viridis*. The main psychoactive properties in ayahuasca result from the combination of dimethyltryptamine, or DMT, and beta-carboline alkaloids, which act as monoamine oxidase inhibitors (McKenna, 2004; Riba, Valle, Urbano, Yritia, Morte, & Barbanoj, 2003). This combination allows for the oral consumption of DMT to be psychoactive and produce its intended effects by altering sensory perception in the central nervous system (McKenna, Towers, & Abbott, 1984). Traditionally, the indigenous Amazonian people used ayahuasca to alleviate illness and promote spiritual or religious experiences (Labate & Cavnar, 2014; Schmid, 2012). Although medicinal and mystical use of ayahuasca dates back for centuries, empirical work on ayahuasca’s potential to treat numerous psychological disorders, including mood disorders, substance use disorders, and posttraumatic stress disorder, is new (Domínguez-Clavé et al., 2016; Hamill, Hallak, Dursun, & Baker, 2018; Mian, Altman, & Earleywine, in press; Palhano-Fontes et al., 2019). This budding literature, in conjunction with future work, might confirm ayahuasca’s utility as a healing, medicinal substance.
Individuals might also seek out experiences with the substance to promote growth or emotional healing (Tupper, 2008; Winkelman, 2011). These experiences typically occur as ceremonies or retreats, often led by extensively trained shamans in countries of South America, including Peru, Ecuador, Colombia, and Brazil (Grunwell, 1998; Metzner, 1999). More recently, two of the largest Brazilian ayahuasca religions, Santo Daime and União do Vegetal (UDV), have expanded to host retreats in America, Europe, Australia, and Asia, making the psychoactive brew more globally accessible (Labate & Jungaberle, 2011; Labate, Rose, & dos Santos, 2009). Despite the differences in ceremony locations, many aspects of the ceremony experience remain the same. Usually, participants begin preparing for the ceremony weeks in advance by maintaining specialized diets, including limiting red meat, salt, and sugar consumption (Uthuag et al., 2018). Additionally, the shaman might instruct ceremony-goers to avoid stressful scenarios and sexual intercourse before the ceremony, to promote a more introspective and mindful experience (Uthuag et al., 2018).

Once in attendance at the ceremony, the shaman plays a key role by facilitating the experience for participants and by nurturing a safe environment. In fact, some qualitative work reveals that a negative encounter with the shaman can harmfully impact the entire experience (Kavenská & Simonová, 2015). In addition to the shaman, the style of the ceremony can influence the users’ experience. Many ceremonies occur in group formats and promote socialization and sharing among participants, especially for problem-solving and support purposes (Winkelman, 2001). Some ceremonies include live instrumental music and the singing of icaros (traditional songs which promote healing) while others promote a quieter and more introspective experience (Harris & Gurel, 2012; Luna, 1986; Luna, 2011). The interaction of the shaman and the specifics of the ritual set the tone for the ingestion experience.
Ayahuasca produces a host of subjective effects. Typically, the first effects of the substance are noticeable within 30 to 60 minutes after ingestion; these often peak between 60 and 120 minutes (Riba et al., 2001). Ayahuasca can continue to alter one’s subjective state acutely for four hours or so after ingestion (Shanon, 2002). Once users metabolize the tea, they might experience intense, dream-like visual hallucinations (Domínguez-Clavé et al., 2016). Correlates of ayahuasca ingestion include increased activation in brain areas associated with vision (e.g. occipital, temporal, and frontal lobe areas), even during a closed-eye imagery task, indirectly confirming the visual effects (de Araujo et al., 2012). Not all users experience these visuals, perhaps suggesting an unpredictable nature of hallucinogens in general (Domínguez-Clavé et al., 2016; Swanson, 2018). Users might also experience an increased sensitivity to auditory stimuli (Riba et al., 2001).

Additionally, ayahuasca might induce cognitive changes, producing intense emotional reactions and generating new perspectives (Frecska, Bokor, & Winkelman, 2016; Uthuag et al., 2018). In some cases, these alterations in cognition might inspire individuals to reprocess previous events and allow for greater comprehension about the influence of past events on an individual’s life (Liester & Prickett, 2012). Still, other users report experiencing frightening, paranoia-like states, which might instill regret about the user’s choice to participate in the ceremony (Kjellgren, Eriksson, & Norlander, 2009). Typically, adverse reactions subside after short periods; verbal encouragement can help to provide relief in some circumstances (Riba et al., 2001). Some data suggest that individuals might experience psychosis after ayahuasca ingestion; however, these occurrences are rare and might covary with pre-existing mental health conditions (dos Santos, Bouso, & Hallak, 2017). Overall, these variations in experiences suggest the influence of “set” and “setting” deserves considerable attention.
In addition to the perceptual and cognitive changes ayahuasca might produce, one must also consider the physical effects. Many individuals experience nausea or vomiting after they ingest the tea (Riba et al., 2001; Shanon, 2002). While these effects are certainly discouraging to some, others cite purging as a necessary component of ayahuasca use, allowing for the release of psychological suffering and summoning a meaningful perspective on past experiences (Kavenská & Simonová, 2015; Loizaga-Velder, 2013). In spite of these aversive physical short-term side effects, healthy users tolerate ayahuasca well, and long-term negative reactions are rare in laboratory settings (dos Santos, Balthazar, Bouso, & Hallak, 2016).

Moreover, many users report long-lasting changes in both their behaviors and cognitions after ingesting ayahuasca. Qualitative data suggests that after an ayahuasca ceremony, individuals report positive life changes, including increases in savoring positive moments, improvements in physical health, enhanced self-compassion, and decreased substance use (Harris & Gurel, 2012). Other studies have demonstrated lasting changes in self-reported depressive symptoms after ayahuasca use. These improvements persisted up to one month later, in both a naturalistic setting and an open-label trial (Sanches et al., 2016; Uthaug et al., 2018). A recent review suggests that ayahuasca use is associated with reductions in psychiatric symptoms and increases in mindfulness and self-confidence in both the short- and long-term (dos Santos et al., 2016). Thus, ayahuasca might engender positive, life-altering effects, which might buffer against the impact of any negative side effects experienced during acute consumption of the drug.

**Differences Between Ayahuasca and Other Hallucinogens**

Although literature suggests ayahuasca’s effects may parallel the impact of other
psychedelics, including LSD and mushrooms, some work suggests otherwise (Riba et al., 2001). While some researchers have attempted to gather data about the subjective experiences of individuals using different hallucinogens, mainly via the Hallucinogen Rating Scale (HRS; Strassman, 1994), very little work has directly compared individuals’ experiences with different drugs within this class. The findings of one qualitative study suggest that individuals should be experienced with the effects of hallucinogens before trying ayahuasca (Wiecko, Thompson, & Parham, 2016). In fact, many ayahuasca users report experience with other psychedelics including LSD, mushrooms, and MDMA (Harris & Gurel, 2012). These data are corroborated by the findings of another study where individuals rated the effects of ayahuasca as stronger than LSD and magic mushrooms (Lawn et al., 2017). These participants also reported more negative acute effects of ayahuasca compared to LSD; however, these results likely arise because of the nausea and vomiting experienced after ingesting the substance. These individuals also rated ayahuasca as less likely to produce harm compared to LSD or mushrooms. This finding implies that individuals might believe this drug is safer than other psychedelics.

Moreover, while ayahuasca might produce different physical sensations compared to other hallucinogens, the psychoactive tea might also engender novel subjective experiences that differ from more traditional psychedelics. A recent study examined the occurrence of “God encounter experiences” among individuals who reported no use of hallucinogens versus individuals who used four different hallucinogenic substances (e.g. psilocybin, LSD, ayahuasca, and dimethyltryptamine (DMT)) (Griffiths, Hurwitz, Davis, Johnson, & Jesse, 2019). Compared to those who ingested psilocybin or LSD, ayahuasca users reported more positive life outcomes after their God encounter, including enhanced social relationships, more positive self-views, and increased spirituality. Taken together, these results suggest discernible features of the ayahuasca
experience potentially render it unique from more traditional psychedelics; however, given the paucity of research on this topic, more work appears justified. These variations in subjective effects might influence individuals’ likelihood to use ayahuasca or other hallucinogens in the future. Should the effects prove discernably unique, participants might benefit from an education about the novel facets of the tea.

**The Influence of Expectancies on Future Hallucinogen Use**

Past experiences with a substance might also lead individuals to generate expectancies about how that drug might affect them during future ingestion. Substance use expectancies typically include an individual’s beliefs, either positive or negative, about how a substance might influence his or her subjective experience (McPherson & Harris, 2015). Although expectancies typically develop prior to substance use, ingestion can either bolster or oppose these preconceived notions (De Leo & Earleywine, 2013; Dunn & Goldman, 1998). Importantly, these initial experiences have implications for future use. Positive expectancies typically covary with more frequent and heavy substance use, while negative expectancies often predict abstinence (Gaher & Simmons, 2007). In both the cannabis and alcohol literature, expectancies about the effects of these substances are associated with either drug-taking or avoidance behaviors (Christiansen, Smith, Roehling, and Goldman, 1989; Jones, Corbin, & Fromme, 2001; Metrik et al., 2009; Schafer & Brown, 1991).

Very little work has directly examined the role of hallucinogen expectancies and their influence on the users’ subjective experience and future hallucinogen-taking behavior. Early work suggests that levels of worry before using psilocybin predicted fewer positive experiences while using the substance and a decreased likelihood of ingesting it again (Leary, Litwin, & Metzner, 1963). Similarly, other work has demonstrated that positive expectancies about the
effects of psilocybin covary with more positive experiences when ingesting the substance (Metzner, Litwin, & Weil, 1965). More recently, data revealed that previous experiences with classic hallucinogens might influence present psilocybin use (Studerus, Gamma, Kometer, & Vollenwider, 2012). Despite this limited work on general hallucinogen expectancies, to the author’s knowledge, the impact of expectancies about ayahuasca and their role in determining future ayahuasca seeking and ingesting behavior remains unexamined. For this reason, an exploration of the role of expectancies and other predictors of the use of ayahuasca or other hallucinogens appears warranted.

**The Role of Alternative Predictors in Substance Choice**

While differences in effects may influence individuals’ substance preferences, other factors might predispose some people toward certain substances. Some work suggests we can differentiate poly-substance users from single-drug users (Galizio & Stein, 1983). However, despite numerous attempts, the literature has not cited any conclusive predictive evidence for who will use what substance (Forsyth, Parker, & Finlay, 2003). A preponderance of work has linked personality factors to substance use; nevertheless, personality does not appear to differentiate users of different substances conclusively either (Kotov, Gamez, Schmidt, & Watson, 2010; Palmer & Daiss, 2005; Terracciano, Löckenhoff, Crum, Bienvenu, & Costa, 2008). Moreover, while some data suggest that we can predict who would and would not use hallucinogens, we know little about who might use these substances and their rationale for using one substance in this class over another (Bouso, dos Santos, Alcázar-Córcoles, & Hallak, 2018; Vito, Schafer, Higgins, Marcum, & Ricketts, 2015). Due to the growing popularity of hallucinogens, this class of drugs and its users deserve more attention.
Relatedly, individuals’ intentions for use might drive their substance choices. For instance, a qualitative study of intentions to ingest ayahuasca found that individuals sought out the tea as relief from psychological suffering, an alternative to traditional Western medicine, a spiritual awakening, or to promote greater awareness of their inner worlds (Harris & Gurel, 2012). Other qualitative work intimates that the primary motive endorsed for using ayahuasca is curiosity and seeking of new experiences, followed by dealing with psychological suffering, instilling self-knowledge, and a broad interest in psychedelics (Kavenská & Simonová, 2015). To the author’s knowledge, no data have examined what factors might drive an individual to seek ayahuasca to achieve these claims over other hallucinogens; thus, future research is needed to elucidate the intentions behind these users’ preferences.

The Present Study

Perhaps due to the sacred nature of the ayahuasca ceremony, research is lacking about individuals’ experiences with the psychoactive tea and how it differs from other substances. Current research cannot identify who might seek out ayahuasca rather than other hallucinogens. The present study queried users about their experience with ayahuasca (and whether it differed from other substances) in an effort to predict individual substance choices. We hypothesized that ayahuasca use would covary with a greater connection to nature than other psychedelic drugs. Ayahuasca might also produce more undesirable physical reactions, such as vomiting, nausea, and diarrhea than other hallucinogens, which might discourage later use. Additionally, we believed that the sum of these experiences would correlate with individuals’ willingness to ingest ayahuasca over other hallucinogens in the future. Should these findings hold true, we might better understand the facets of the ayahuasca experience that compel individuals to choose ayahuasca over other psychedelics.
Method

Participants

Participants (N=152) in this study responded to requests on social media to complete an online survey addressing demographic variables, ayahuasca and other hallucinogen use, beliefs about how ayahuasca’s novelty compared to other hallucinogens, and intentions on using ayahuasca and other hallucinogens again. Eligible participants were 18 years of age or older who had used ayahuasca at least once in their lifetime. Participants in this study were required to provide informed consent before beginning the survey. We also provided an opportunity to opt out again following survey completion. Participation in this study was both voluntary and confidential. All study procedures were approved by the local Institutional Review Board. We excluded 13 participants from our original sample of 152 respondents who reported no lifetime use of ayahuasca, leaving a final sample of 139 participants. Among this sample, fifty-four percent identified as male (75) and forty-five percent identified as female (62). The majority of this sample reported being between the ages of 40-49 (29.5%), followed by 30-39 (25.9%), 50-59 (18.0%), 21-29 (13.7%), 60 or older (12.2%), and 18-20 (.7%). Participants in this sample were predominantly Caucasian (87.1%) and highly educated, with 29% reporting holding a bachelor’s degree and 29.7% reporting having a graduate degree. Full sample characteristics appear in Table 1.

Measures

After responding to demographic questions, participants completed each of the following measures.
Ayahuasca use. Participants reported on their lifetime ayahuasca use. Additionally, follow-up questions revealed how many years and months had elapsed since the participants’ most recent ingestion.

Hallucinogen use. Participants answered questions detailing their lifetime use of other hallucinogens, including LSD, mushrooms, psilocybin, DMT, salvia, peyote, mescaline, PCP, MDMA, ketamine, DXM, ibogaine, and DOT.

Novelty of ayahuasca scale. A separate sample of 19 participants (11 women) helped generate items by responding to the prompt, “How is ayahuasca different from other hallucinogens like mushrooms or LSD?” in a group setting. Each participant had used ayahuasca at least twice and LSD and mushrooms at least once. Initial ideas led to 44 items, which were collapsed to 22 based on similar content or intent. These 22 were then reviewed by two people familiar with scale construction who had used ayahuasca at least six times and LSD and mushrooms at least six times each, who reduced the list to 19 items based on ambiguity or overlapping content. These 19 items were then reviewed by a shaman trainee who had used ayahuasca approximately 700 times and mushrooms and LSD approximately 10 times each. The final list of items used in this scale are indicated in Table 2. Participants were presented with the prompt, “Compared to ‘typical hallucinogens’, ayahuasca…” and were asked to respond to the items on a Likert scale from –2 (completely false) to 2 (completely true). Cronbach’s alpha of this original scale, with all 19 items included, was .784.

Likelihood of future use. Participants reported on their likelihood to ingest ayahuasca again in their lifetime, the next year, the next 3 months, and the next month. Answer options ranged from -3 = “Impossible” to 3 = “Definitely will happen”. Similarly, participants also reported on their likelihood to use other hallucinogens besides ayahuasca in their lifetime, the
next year, the next three months, and the next month. For the purposes of the present study, we were interested in individuals’ proclivity to use ayahuasca over other hallucinogens. To examine this likelihood, we generated a difference variable by subtracting “likelihood to do other hallucinogens” from “likelihood to do ayahuasca,” indicating how likely participants were to use ayahuasca over other hallucinogens in their lifetime, the next year, the next 3 months, and the next month. We then combined these four time variables (lifetime, next year, next 3 months, and next month) to generate one composite variable, indicating participants’ likelihood of using ayahuasca over other hallucinogens at all time points in the future. The internal consistency of these four variables was high (Cronbach’s \( \alpha = .897 \)).

**Data Analytic Plan**

All data analyses employed SPSS 25.0. First, we examined ayahuasca and other hallucinogen use among this sample. Next, we conducted a series of one-sample t-tests against 0 to examine whether participants believed that ayahuasca produced significantly different effects from other hallucinogens. Due to the large number of analyses, we used a Bonferroni approach to correct for inflations in Type I error (Wilcox, 2013). For these 19 analyses, we considered a p-value of \( p<.001 (\text{.05/19}) \) to be significant. Next, we performed an exploratory factor analysis (EFA) of the novelty of ayahuasca scale to identify factorable components of individuals’ experiences with the substance. Additionally, we conducted a multiple regression to determine whether the factors yielded by the EFA accounted for a significant amount of unique variance in individuals’ intentions to use ayahuasca over other hallucinogens, while controlling for the influence of gender and lifetime ayahuasca use. Finally, we examined correlations among relevant study variables, including factors of the novelty of ayahuasca scale, the global scale after removing unfit items, and participant’s likelihood of using ayahuasca again over other hallucinogens.
Results

Ayahuasca Use

Participants reported using ayahuasca an average of 43.96 (SD=139.28, Median = 9.00, Range = 1-1100) times in their lifetime. After converting to Z-scores and removing all outliers with absolute values greater than 3, the trimmed mean for lifetime ayahuasca use decreased to 25.08 (SD=50.92, Median = 8.00, Range = 1-350). Additionally, participants reported that on average .58 years (SD=1.838, Median=0.00, Range = 0-18) and 2.77 (SD=2.77, Median=2.00, Range = 0-11) months had elapsed since their most recent ingestion.

Hallucinogen Use

Participants reported mean lifetime use of various hallucinogens, including LSD (27.51, SD = 104.99, Median =1.00, Range = 0-1000), mushrooms (25.64, SD=94.08, Median = 5.00, Range =0-1000), and psilocybin (.19, SD=1.027, Median=0.00, Range =0-10). A complete breakdown of lifetime hallucinogen use can be found in Table 2.

Differences in Experience When Using Ayahuasca Versus Other Hallucinogens

One sample t-tests indicated that all ayahuasca experience variables were significantly different from 0, p<.001, (t(133-136) ranging from 6.212 to 27.658), except for “almost requires being out in nature” (t(136) = 2.033, p=.044), “has the potential to lead to darker thoughts” (t(135) =1.459, p=.147) and “can create more negative thoughts or emotions” (t(134) = -2.276, p=.024; See Table 3). Items did not differ by gender given the adjusted p-value (p<.001). Additionally, we calculated Cohen’s d effect sizes for these variables, which ranged from small to very large (0.14 to 2.18).

Exploratory Factor Analysis for the Novelty of Ayahuasca Scale
We conducted an exploratory factor analysis using a principal axis factor extraction to establish the factor structure of 19 items related to participants’ experiences using ayahuasca compared to other hallucinogens. Although our sample size was smaller than desirable, a sample size of 139 exceeds the minimum requisite 5:1 ratio for number of participants to number of variables in an exploratory factor analysis (Costello & Osborne, 2005; Gorsuch, 1983). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (.72) and Bartlett’s test of sphericity ($\chi^2 = 675.01, df = 171, p < .001$) demonstrated that these data were factorable. According to a visual inspection of the scree plot and examination of eigenvalues greater than 1.00, we determined that a three-factor solution was appropriate (eigenvalues = 4.03, 2.92, and 1.65). To interpret the three factors that accounted for 45.27% of the variance, we used a promax rotation. After running this preliminary 3-factor model, we noted that 7 of the original variables did not map onto these 3 factors (“almost requires being out in nature,” “could create strong visuals or none at all,” “depends more on songs and music,” “is less recreational,” “is more likely to have no impact at all,” “makes bigger demands of users,” and “leads to thoughts of being out in the open or wilderness”). We excluded these items and reran our analysis. Removal of these seven items decreased Cronbach’s alpha from .784 to .685. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy remained the same (.72) and Bartlett’s test of sphericity remained significant ($\chi^2 = 434.740, df = 66, p < .001$). An examination of extracted communalities suggested that these remaining items mapped onto the three factors well. According to visual inspection of the scree plot and an examination of eigenvalues, a three-factor model still appeared justified (eigenvalues = 3.03, 2.62, 1.38). This 3-factor model accounted for 58.60% of the total variance in the scale.
Examination of the pattern matrix indicated a three-factor structure, with five items loading onto factor 1, four items loading onto factor 2, and three items loading onto factor 3 at values of .45 or greater. Based upon the loadings, we described the factors in the following ways. Factor 1 included the following items: “has more of a connection to earth,” “is more of a medicine,” “seems closer to other plants and the earth,” “can seem particularly great with the right facilitators or shaman,” and “changes more with the shaman.” We concluded that factor 1 represented positive aspects of users’ ayahuasca experience that increased their connection to nature and their shaman. Factor 1 accounted for 25.25% of the total variance in the scale. Factor 2 included “has the potential to lead to darker thoughts,” “can create more negative thoughts or emotions,” “can be more terrifying,” and “creates results that are harder to predict.” These factor loadings suggested that factor 2 was composed of aspects of users’ experiences that led to more negative or unpredictable reactions. Factor 2 accounted for 21.85% of the variance in the scale. Factor 3 included “makes people throw up more often,” “can cause more nausea,” and “leads to diarrhea more often.” The combination of these variables suggested that factor 3 represented negative physical reactions associated with ayahuasca use. Factor 3 accounted for 11.49% of the total variance in the scale. Table 4 demonstrates observed factor loadings for this sample.

**Intentions to Use Ayahuasca Over Other Hallucinogens**

We ran a standard linear regression with intentions to use ayahuasca over other hallucinogens as the outcome variable and factors 1, 2, and 3 as the predictors, while controlling for the influence of participant gender and lifetime ayahuasca use. First, we examined the data for the presence of univariate and multivariate outliers. The lifetime use of ayahuasca variable had 3 univariate outliers, which were removed before proceeding with analyses. To assess for the presence of multivariate outliers, we evaluated the Mahalanobis distances of the variables in the
regression equation. Accordingly, four cases were multivariate outliers, which we excluded from the present analyses. After removal of the outliers, the data appeared to meet the assumptions for linearity and normality; however, examination of the residual plots suggested slight heteroscedasticity, suggesting cautious interpretation of these findings. Indices of internal consistency for the three factors appeared to be within the acceptable range (Cronbach’s $\alpha = .76, .74, \text{and } .70$, respectively). The order of entry was as follows: step 1 = participant gender and lifetime ayahuasca use, step 2 = factor 1, factor 2, and factor 3. Observed tolerance and variance inflation factor (VIF) were within in the requisite ranges, indicating that there is no significant multicollinearity among these variables.

The results for the first model step, containing participant gender and lifetime ayahuasca use, was not significant ($F(2, 116) = 1.16, p = .318$). Thus, we did not examine this model further. The second regression analysis, containing the covariates and factors 1, 2, and 3, was significant ($F(5, 113) = 3.97, p < .01$, adjusted $R^2 = .11$). The adjusted $R^2$ value suggests that approximately 11% of the variance in the dependent variable could be accounted for by the predictors. In this model, only factor 1 ($B = .69, t = 2.99, p < .01$) and factor 3 ($B = -.89, t = -2.68, p < .01$) had significant main effects on the dependent variable. The positive beta coefficient for factor 1 suggests that higher scores on factor 1 were associated with an increased likelihood of preferring ayahuasca over other hallucinogens. Alternatively, the negative beta coefficient associated with factor 3 implies that higher scores on factor 3 were associated with a decreased likelihood of favoring ayahuasca over other psychedelic substances. An examination of the squared semi partial coefficients for these variables demonstrates that removal of factors 1 and 3 from the regression equation would yield a 7% and 6% decrease in predictive utility, respectively. Participant gender,
lifetime ayahuasca use, and factor 2 were not significant predictors of individuals’ preferences toward ayahuasca (See Table 5).

**Relation of the Novelty of Ayahuasca Scale to Likelihood to Use Ayahuasca Again**

We correlated The Novelty of Ayahuasca Scale and its 3 factors with a measure of intended future use of ayahuasca minus intended use of other hallucinogens. We also correlated the scale with intentions to use ayahuasca in the future and intentions to use hallucinogens in the future. The total score (Global Scale; sum of all 12 items with items from Factors 2 and 3 reverse-scored) on The Novelty of Ayahuasca Scale significantly positively covaried with intentions to use ayahuasca over other hallucinogens in the future, and negatively covaried with intentions to use other hallucinogens again in the future. Factor 1 of the scale (positive aspects of users’ experience that increased their connection with nature and their shaman) was positively related to individuals’ likelihood of future use of ayahuasca over other hallucinogens and negatively related to intentions to use other hallucinogens in the future. Factor 1 did not correlate significantly with simple intentions to use ayahuasca. Factor 2 (negative or unpredictable reactions) was not significantly related to any measure of intentions of future use. Factor 3 of the scale (negative physical reactions associated with ayahuasca use) negatively covaried with intentions to use ayahuasca again over other hallucinogens. Additionally, using the method for comparing correlated correlation coefficients proposed by Meng, Rosenthal, and Rubin (1992), we found that the relation between preference for ayahuasca over other hallucinogens and Factor 3 was significantly stronger than the association between ayahuasca preference and Factor 1 (p<.001). Correlations among study variables appear in Table 6.

**Discussion**
Few studies address differences among hallucinogens and their role in intentions to use them. The present study sought to determine if novel aspects of the ayahuasca experience contributed to decisions to use it again. Predicting who will use which hallucinogen might provide insights into differences among the substances. This information can also help researchers focus on ways to minimize harm and let users make informed decisions about their use. The Novelty of Ayahuasca Scale reveals that ayahuasca differs dramatically from other hallucinogens on three factors: a greater connectedness to nature and other people, unpredictable or negative cognitive responses, and negative physical responses. These factors relate to individuals’ likelihood to use ayahuasca in the future over the same likelihood that they would use other psychedelics, with connection correlating positively, negative physical responses correlating negatively, and a total score that also correlated positively. Taken together, our findings confirm that expectancies about ayahuasca’s effects predict intentions to use the psychoactive brew again, much like research has revealed for other substances (Goldman, Brown, & Christiansen, 1987; Hayaki, Hagerty, Herman, de Dios, Anderson, & Stein, 2010; Metrik et al., 2009; Metzner, Litwin, & Weil, 1965).

A close look at results from the individual items of The Novelty of Ayahuasca Scale underscores some previous research but also challenges some stereotypes about the substance. Individual items with high scores reveal that users appear to view the tea as a medicine with outstandingly dramatic effects that potentially vary with the shaman and contribute to healing. Respondents reported striking differences from typical hallucinogens like LSD or psilocybin on two items that specifically mention that role of the shaman (“changes more with the shaman” and “can seem particularly great with the right facilitators or shaman”) with large effects (Cohen’s d=1.13 and 2.18, respectively). These results replicate previous work suggesting that the shaman
plays an integral role in ayahuasca ceremonies (Kavenská & Simonová, 2015). The medical implications also appeared on two items with very large effect sizes, “is more of a medicine” (Cohen’s d = 1.61) and “is less ‘recreational’” (Cohen’s d = 1.62). Previous literature supports these results about healing potential; individuals reportedly use ayahuasca, as opposed to other psychedelics, for healing purposes (Harris & Gurel, 2012). This finding is also bolstered by the current push to examine ayahuasca’s medicinal capacities for treating numerous psychological conditions (Palhano-Fontes et al., 2019; Hamill et al., 2018; Domínguez-Clavé et al., 2016).

Users also believed that their ayahuasca use increased their connectivity to earth and nature more so than other hallucinogens (Cohen’s d= 1.55 and 1.26, respectively). This enhanced relationship to one’s surroundings may also serve a restorative purpose. One hypothesis for this finding is that individuals might believe naturally-occurring DMT is more connected to the earth than more manmade dissociative drugs (e.g. PCP and Ketamine). Future qualitative work might be used to more deeply understand what makes ayahuasca unique from other hallucinogenic substances. Collectively, these curative aspects of users’ ayahuasca experience that increased their connection to their shaman and to nature covaried positively with intentions to use ayahuasca over other hallucinogens in the future. Coincidentally, factor 1 was a significant predictor of an individual’s likelihood of preferring ayahuasca over other hallucinogens in the future. Potential users seeking out the social connectedness component of the ayahuasca experience might also benefit from psychotherapeutic interventions aimed at increasing social support.

The present findings also suggest that some subjective aspects of the ayahuasca experience are more unpredictable. Participants reported that the psychoactive brew is more likely to “create results that are harder to predict”, “makes bigger demands of users”, and “can be more terrifying” than other hallucinogens (Cohen’s d= 1.30, .79, and .55, respectively). These
results confirm the somewhat variable nature of ayahuasca and underscore the influence of an individual’s set and setting when using any hallucinogenic substance (Leary, Litwin, & Metzner, 1963). These variables and two others addressing the negative cognitions produced by ayahuasca (“has the potential to lead to darker thoughts” and “can create more negative thoughts or emotions”) comprised factor 2, which did not significantly predict individual’s intentions to use ayahuasca over other psychedelics in the multiple regression. Relatedly, factor 2 did not significantly correlate with individuals’ preferences for ayahuasca over other hallucinogens. Perhaps users consider these effects in combination with the perceived benefits of the psychoactive tea and the effects cancel each other out. Alternatively, individuals might recognize the potential for negative cognitions with all substances within this class; thus, it might not be predictive of whether or not someone uses ayahuasca over other hallucinogens.

Respondents also experience more nausea, vomiting, and diarrhea while using ayahuasca compared to other psychedelics (Cohen’s d= 1.47, 1.59, and .56, respectively). This gastrointestinal distress is inversely correlated with individuals’ intentions to use ayahuasca over other hallucinogens in the future. This relation is corroborated by the results of the multiple regression where factor 3 is inversely related to participants’ future likelihood of consuming ayahuasca. Apparently, these negative physical effects inhibit a preference for ayahuasca over other hallucinogens. For potential users who might already experience some gastrointestinal discomfort, such as those who suffer from inflammatory bowel disease (IBD), ayahuasca has the potential to exacerbate these conditions.

Three items did not fit some prevalent stereotypes about ayahuasca. Two items related to negative, dark, or gloomy cognitions failed to differ from zero on their ratings (“has the potential to lead to darker thoughts” and “can create more negative thoughts or emotions”). This result
contrasts with previous papers where users reported greater negative effects after ingesting ayahuasca than when on LSD or mushrooms (Lawn et al., 2017). Perhaps these discrepant findings arise because of the ambiguity around the “negative effects” reported by users in the Lawn study. Future work might benefit from more specific answer options to allow individuals to report nuances about their ayahuasca experiences. Furthermore, the only other item that did not differ significantly from 0 (“almost requires being out in nature”), might suggest a common feature of hallucinogen use — that an outdoor environment might enhance experience with any of them (Shanon, 2002). Although we are reluctant to argue from a null result, this result might reassure those who are contemplating ayahuasca consumption if they are concerned about a more aversive or gloomy experience than that created by other hallucinogens.

It is important to note that substance availability might also influence individuals’ willingness to use ayahuasca or other hallucinogens again in the future. Ayahuasca is not as readily accessible in the United States as substances like LSD or mushrooms. Moreover, the preparation for an ayahuasca ceremony requires significant physical and mental commitment. Nevertheless, individuals report intending to use ayahuasca again in their lifetimes. These future intention variables should be corroborated with future use patterns, as practical barriers, such as finances, employment, and familial obligations, might prevent individuals from gaining access to ayahuasca again. Although these individuals intend to use ayahuasca again in the future, it is possible they might choose to use another hallucinogenic substance which is easier to acquire.

**Potential Contributors to Item Selection**

A number of items from the original Novelty of Ayahuasca Scale did not map onto the three factors in our exploratory factor analysis (EFA). Further examination of these items yielded several hypotheses about the meaning of their exclusion. In our t-tests, participants compared
ayahuasca to traditional hallucinogens for a number of items on a scale from -2 (completely false) to +2 (completely true). For the item “is more likely to have no impact at all”, the observed t-value was -13.1 (p<.001) with a large effect size (Cohen’s d=1.17). This result suggests that individuals believe other hallucinogens are more likely to produce no effect than ayahuasca. Perhaps because traditional ayahuasca use occurs in ceremony formats with shamans who provide specific instructions, users experience optimal ingestion effects. Alternatively, individuals who opt to ingest other hallucinogens might not be obtaining these drugs from reliable sources and, as such, may be consuming fake products.

Other items, such as “better with the right shaman” and “is less recreational” appear very similar to items which were included in the EFA (e.g. “can seem particularly great with the right facilitator or shaman” and “is more of a medicine”). For instance, the correlation between “better with the right shaman” and “can seem particularly great with the right shaman” is r=.425. It is plausible that these items correlated too highly with other items already included and thus, they were excluded for the purposes of these analyses. Future work should examine nuances between these items to consider if they should be modified to gain a more detailed picture about the ayahuasca experience.

Finally, three items related to set and setting (e.g. “almost requires being out in nature”, “depends more on songs and music”, and “leads to thoughts of being out in the open or wilderness”) did not map onto any of the observed factors in the EFA. While two of these three items yielded significant t-values in our independent t-tests, “almost requires being out in nature” did not when compared to a conservative p-value of .001 (t=2.03, p=.044). It is possible that these items did not uniquely relate to individuals’ ayahuasca experiences and more broadly represent important attributes of experiences with psychedelic substances. Similarly, the item
“could create strong visuals or none at all” yielded a significant t-value with a large effect size 
\( t=22.17, \text{Cohen’s } d=1.80 \), but did not map onto any of the observed factors of the EFA. This 
item may also not be specific enough to ayahuasca to warrant inclusion in the final Novelty of 
Ayahuasca Scale, as many psychedelics produce visual hallucinations. A more in-depth 
exploration of facets of the hallucinogen experience that are unique to ayahuasca appears 
warranted.

Taken together, it is apparent that factor 3 (negative physical reactions associated with 
ayahuasca use) negatively covaries with individuals’ intentions to use ayahuasca in the future. 
Among our sample, ayahuasca’s notorious gastro-intestinal effects were associated with a 
decreased likelihood of wanting to use the substance again in the future. Factor 3 is the only 
factor that significantly predicted individuals’ intentions of using ayahuasca again in their 
lifetimes. Alternatively, when examining individuals’ intentions of using other hallucinogens in 
the future, only factor 1 (positive aspects of users’ ayahuasca experience that increased their 
connection to nature and their shaman) was negatively associated. This suggests that individuals’ 
positive experiences with ayahuasca might make them less likely to seek out other hallucinogens, 
like LSD or psilocybin. Finally, looking at the difference between users’ intentions to seek out 
ayahuasca over more traditional psychedelic substances, it appears that factor 1 relates positively 
while factor 3 correlates negatively. This result is bolstered by the findings of the multiple 
regression, where factor 1 is a significant positive predictor and factor 3 is a significant negative 
predictor. This means that ayahuasca consumers, who experience more positive effects and 
increased connectiveness to the earth, will prefer to use the psychoactive tea again over other 
hallucinogens in their lifetime. Conversely, individuals who do not tolerate nausea, vomiting, or 
diarrhea well might be more inclined to use other hallucinogenic substances over ayahuasca.
According to the procedure for correlating correlated coefficients, factor 3 was more strongly related to ayahuasca preference than factor 1. This intimates that the negative side effects of using ayahuasca might outweigh the positives when individuals consider using the substance again. Factor 2 did not significantly relate to individuals’ proclivities toward ayahuasca nor other hallucinogens, perhaps because it underscores the variable nature of all hallucinogenic substances, which might cause apprehension in users. These results intimate that we might be able to predict which hallucinogenic substance individuals will prefer to use in the future based on their previous experiences with ayahuasca.

In summary, the Novelty of Ayahuasca Scale reveals distinct ways in which users’ experiences with ayahuasca differ from experiences with more traditional hallucinogens. Users cited that ayahuasca makes them feel closer to nature, might engender more negative or unpredictable reactions, and induces more gastro-intestinal distress compared to other psychedelic substances. Moreover, these unique aspects of the ayahuasca experience map onto individuals’ willingness to use the psychoactive tea again in the future over other hallucinogens. The creation of this scale might aid some users in determining whether or not they should try ayahuasca based on the experiences of others. Additionally, the results of this study suggest that some individuals might be better off trying another hallucinogenic substance if aspects of the ayahuasca experience seem distressing or intolerable. For individuals who might seek out ayahuasca for medicinal, recreational, or perspective-raising purposes, the Novelty of Ayahuasca Scale might serve as an educational resource to help them decide if the psychoactive tea is the right substance for their intentions. Especially among those seeking relief from depression, anxiety, and trauma, the scale can allow these individuals to make an informed choice about the perceived pros and cons of using ayahuasca as a healing substance.
Limitations

Like many computer-administered, cross-sectional, self-report studies of illicit psychoactive substance use and relevant correlates, these data require cautious interpretation. Our predominantly Caucasian, middle-aged, highly educated sample responded via computer on a single occasion long after subjective effects of ayahuasca had likely dissipated. Despite our concerted efforts to assure anonymity, legal sanctions against hallucinogens and imperfections in recall might alter reports of frequency of consumption. The precise nature of the ayahuasca experience and facets of the ceremony might also fade with time, potentially leading to inaccurate reporting. A large, diverse sample who could complete measures without access to computers could help reveal if the new scale’s factor structure and the relations with intentions of future use applies to a wider range of people. A longitudinal design that permitted follow-ups of extended duration and confirmation of subsequent use of ayahuasca or other hallucinogens would certainly provide an improved test of these hypotheses. Additionally, qualitative reports could help clarify the nature of differences between various types of hallucinogens. Due to the importance of the highly subjective experience of these substances, future studies might employ interview formats to gain a more nuanced perspective about the unique qualities of specific drugs.

In addition, although individuals within this sample were relatively experienced with hallucinogens, few endorsed lifetime use of psilocybin, DXM, ibogaine, and DOT. Participants were most experienced with LSD, mushrooms, and MDMA; thus, our results are mostly generalizable to those substances. Ayahuasca was the most frequently used hallucinogen among this sample, suggesting the possibility that individuals exaggerated the positive effects of this substance compared to other hallucinogens, due to its familiarity. Future work might target
individuals who have used ayahuasca in addition to other less popular substances to confirm whether these findings apply to those drugs as well.

**Conclusion**

Reports from experienced ayahuasca users revealed that their experiences differ from those with other hallucinogens. These experiences appear to contribute to intentions about future use of the psychoactive tea. Individuals believe that their experiences with ayahuasca are unlike those with other hallucinogens. An exploratory factor analysis revealed that these differences mapped onto three main factors: a positive connection to nature and other people, unpredictable or negative cognitive responses, and negative physical reactions. A multiple regression demonstrated that among all theoretically relevant variables, only factor 1 (connection to nature) and factor 3 (negative physical reactions) significantly predicted individuals’ preferences for ayahuasca over other hallucinogenic substances. The total scale and factors 1 and 3 covaried significantly with how much respondents intended to use ayahuasca in the future relative to their intentions to use other hallucinogens. Comparable work could uncover unique qualities of other hallucinogens, other plant medicines, and other rituals, and reveal if those unique qualities covary with intentions related to future experiences. The current results underscore some of ayahuasca’s unique effects and their role in predicting later use. Future work with a more diverse sample, collateral reporters, and longitudinal follow-up could confirm these findings and add to their generalizability and validity. This knowledge could help us minimize harm related to hallucinogen use by providing realistic expectations for those who are contemplating the use of these substances. Moreover, the development of the Novelty of Ayahuasca Scale might educate those who are considering using ayahuasca and allow them to better prepare for their experience or choose a different psychedelic substance that better meets their needs.
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Uthaug, M.V., van Oosouw, K., Kuypers, K.P.C., van Boxtel, M., Broers, N.J., Mason, N.L., …


### Table 1

**Characteristics of Study Sample**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>75</td>
<td>54.3</td>
</tr>
<tr>
<td>Female</td>
<td>62</td>
<td>44.6</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>121</td>
<td>87.1</td>
</tr>
<tr>
<td>African American</td>
<td>9</td>
<td>6.5</td>
</tr>
<tr>
<td>Latino</td>
<td>7</td>
<td>5.0</td>
</tr>
<tr>
<td>American Indian</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some high school</td>
<td>4</td>
<td>2.9</td>
</tr>
<tr>
<td>Finished high school/GED</td>
<td>16</td>
<td>11.6</td>
</tr>
<tr>
<td>Some college</td>
<td>27</td>
<td>19.6</td>
</tr>
<tr>
<td>Associates degree</td>
<td>10</td>
<td>7.2</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>40</td>
<td>28.8</td>
</tr>
<tr>
<td>Advanced degree</td>
<td>41</td>
<td>29.5</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ayahuasca Use Lifetime</td>
<td>43.96</td>
<td></td>
</tr>
<tr>
<td>Years since last ingestion</td>
<td>.58</td>
<td></td>
</tr>
<tr>
<td>Months since last ingestion</td>
<td>2.77</td>
<td></td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>139.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.77</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2

*Lifetime Use of Hallucinogens*

<table>
<thead>
<tr>
<th>Hallucinogen</th>
<th>Mean (SD)</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSD</td>
<td>27.51 (104.99)</td>
<td>1.00</td>
<td>0-1000</td>
</tr>
<tr>
<td>Mushrooms</td>
<td>25.64 (94.08)</td>
<td>5.00</td>
<td>0-1000</td>
</tr>
<tr>
<td>MDMA</td>
<td>19.55 (82.7)</td>
<td>0.00</td>
<td>0-5</td>
</tr>
<tr>
<td>DMT</td>
<td>3.66 (11.21)</td>
<td>0.00</td>
<td>0-100</td>
</tr>
<tr>
<td>Peyote</td>
<td>2.34 (17.37)</td>
<td>0.00</td>
<td>0-200</td>
</tr>
<tr>
<td>Ketamine</td>
<td>2.18 (7.80)</td>
<td>0.00</td>
<td>0-800</td>
</tr>
<tr>
<td>Mescaline</td>
<td>2.00 (6.317)</td>
<td>0.00</td>
<td>0-60</td>
</tr>
<tr>
<td>Salvia</td>
<td>1.58 (5.50)</td>
<td>0.00</td>
<td>0-50</td>
</tr>
<tr>
<td>Psilocybin</td>
<td>0.19 (1.027)</td>
<td>0.00</td>
<td>0-10</td>
</tr>
<tr>
<td>Ibogaine</td>
<td>0.17 (.63)</td>
<td>0.00</td>
<td>0-5</td>
</tr>
<tr>
<td>PCP</td>
<td>0.10 (.643)</td>
<td>0.00</td>
<td>0-6</td>
</tr>
<tr>
<td>DXM</td>
<td>0.10 (.634)</td>
<td>0.00</td>
<td>0-5</td>
</tr>
<tr>
<td>DOT</td>
<td>0.01 (.087)</td>
<td>0.00</td>
<td>0-1</td>
</tr>
</tbody>
</table>
Table 3

Results of One Sample T-tests

Prompt: How true is each of these items? “Compared to ‘typical hallucinogens’, ayahuasca…”
Scale: -2 (completely false), -1 (mostly false), 0 (neither true nor false), 1 (mostly true), 2 (completely true)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>T-Value</th>
<th>Abs Value of Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can seem particularly great with the right facilitators/shaman</td>
<td>1.51 (.63)</td>
<td>27.66*</td>
<td>2.18</td>
</tr>
<tr>
<td>Could create strong visuals or none at all</td>
<td>1.43 (.76)</td>
<td>22.17*</td>
<td>1.80</td>
</tr>
<tr>
<td>Is less “recreational”</td>
<td>1.47 (.92)</td>
<td>18.67*</td>
<td>1.62</td>
</tr>
<tr>
<td>Is more of a medicine</td>
<td>1.39 (.80)</td>
<td>20.50*</td>
<td>1.61</td>
</tr>
<tr>
<td>Makes people throw up more often</td>
<td>1.21 (.74)</td>
<td>18.85*</td>
<td>1.59</td>
</tr>
<tr>
<td>Seems closer to other plants and the earth</td>
<td>1.31 (.83)</td>
<td>18.13*</td>
<td>1.55</td>
</tr>
<tr>
<td>Can cause more nausea</td>
<td>1.20 (.80)</td>
<td>17.65*</td>
<td>1.47</td>
</tr>
<tr>
<td>Creates results that are harder to predict</td>
<td>1.20 (.91)</td>
<td>15.33*</td>
<td>1.30</td>
</tr>
<tr>
<td>Has more of a connection to the earth</td>
<td>1.11 (.90)</td>
<td>14.48*</td>
<td>1.26</td>
</tr>
<tr>
<td>Is more likely to have no impact at all</td>
<td>-1.20 (1.07)</td>
<td>-13.10*</td>
<td>1.17</td>
</tr>
<tr>
<td>Changes more with the shaman</td>
<td>.95 (.83)</td>
<td>13.31*</td>
<td>1.13</td>
</tr>
<tr>
<td>Makes bigger demands of users</td>
<td>.80 (1.07)</td>
<td>8.74*</td>
<td>0.79</td>
</tr>
<tr>
<td>Leads to thoughts of being out in the open or in the wilderness</td>
<td>.60 (.84)</td>
<td>8.21*</td>
<td>0.73</td>
</tr>
<tr>
<td>Depends more on songs and music</td>
<td>.62 (.93)</td>
<td>7.85*</td>
<td>0.63</td>
</tr>
<tr>
<td>Leads to diarrhea more often</td>
<td>.63 (1.11)</td>
<td>6.54*</td>
<td>0.56</td>
</tr>
<tr>
<td>Can be more terrifying</td>
<td>.60 (1.11)</td>
<td>6.21*</td>
<td>0.55</td>
</tr>
<tr>
<td>Almost requires being in nature</td>
<td>.20 (1.18)</td>
<td>2.03</td>
<td>0.22</td>
</tr>
<tr>
<td>Can create more negative thoughts or emotions</td>
<td>-.21 (1.06)</td>
<td>-2.28</td>
<td>0.15</td>
</tr>
<tr>
<td>Has the potential to lead to darker thoughts</td>
<td>.14 (1.11)</td>
<td>1.46</td>
<td>0.14</td>
</tr>
</tbody>
</table>

Note. *p < .001
Table 4

*Factor Analysis of Ayahuasca Experiences Constructs*

Prompt: How true is each of these items? “Compared to ‘typical hallucinogens’, ayahuasca…”
Scale: -2 (completely false), -1 (mostly false), 0 (neither true nor false), 1 (mostly true), 2 (completely true)

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes more with the shaman</td>
<td>.457</td>
<td>.036</td>
<td>-.130</td>
</tr>
<tr>
<td>Has more of a connection to the earth</td>
<td>.763</td>
<td>-.002</td>
<td>.037</td>
</tr>
<tr>
<td>Is more of a medicine</td>
<td>.751</td>
<td>-.022</td>
<td>.017</td>
</tr>
<tr>
<td>Seems closer to other plants and the earth</td>
<td>.533</td>
<td>.032</td>
<td>-.017</td>
</tr>
<tr>
<td>Can seem particularly great with the right facilitators or shaman</td>
<td>.705</td>
<td>-.102</td>
<td>.029</td>
</tr>
<tr>
<td>Creates results that are harder to predict</td>
<td>.332</td>
<td>.469</td>
<td>-.022</td>
</tr>
<tr>
<td>Can be more terrifying</td>
<td>.018</td>
<td>.553</td>
<td>.212</td>
</tr>
<tr>
<td>Has the potential to lead to darker thoughts</td>
<td>-.009</td>
<td>.831</td>
<td>-.058</td>
</tr>
<tr>
<td>Can create more negative thoughts or emotions</td>
<td>-.142</td>
<td>.677</td>
<td>-.029</td>
</tr>
<tr>
<td>Can cause more nausea</td>
<td>-.010</td>
<td>.063</td>
<td>.699</td>
</tr>
<tr>
<td>Leads to diarrhea more often</td>
<td>-.061</td>
<td>.064</td>
<td>.570</td>
</tr>
<tr>
<td>Makes people throw up more often</td>
<td>.012</td>
<td>-.095</td>
<td>.783</td>
</tr>
<tr>
<td>Eigenvalues</td>
<td>3.03</td>
<td>2.62</td>
<td>1.38</td>
</tr>
<tr>
<td>% of Variance</td>
<td>25.25</td>
<td>21.85</td>
<td>11.49</td>
</tr>
</tbody>
</table>
Table 5

*Predicting Preference for Ayahuasca over Other Hallucinogens from Gender, Lifetime Ayahuasca Use, and Factors 1, 2, and 3*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Preference for Ayahuasca</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>CI (95%)</th>
<th>sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1.45</td>
<td>2.00</td>
<td>1.38</td>
<td>.13</td>
<td>-.74, 4.73</td>
<td>.02</td>
</tr>
<tr>
<td>Lifetime ayahuasca use</td>
<td>1.24</td>
<td>.03</td>
<td>.02</td>
<td>.11</td>
<td>-.02, .07</td>
<td>.01</td>
</tr>
<tr>
<td>Factor 1</td>
<td>2.99*</td>
<td>.69</td>
<td>.23</td>
<td>.26</td>
<td>.23, 1.14</td>
<td>.07</td>
</tr>
<tr>
<td>Factor 2</td>
<td>.46</td>
<td>.10</td>
<td>.23</td>
<td>.04</td>
<td>-.34, .55</td>
<td>.00</td>
</tr>
<tr>
<td>Factor 3</td>
<td>-2.68*</td>
<td>-.89</td>
<td>.33</td>
<td>-.25</td>
<td>-1.54, -.23</td>
<td>.06</td>
</tr>
<tr>
<td>Intercept</td>
<td>-2.58</td>
<td>3.05</td>
<td></td>
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</tr>
</tbody>
</table>

*Note. *p < .01*
### Table 6

*Table of Correlations*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean (SD)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Factor 1</td>
<td>6.27 (2.88)</td>
<td></td>
<td></td>
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<tr>
<td>2. Factor 2</td>
<td>1.69 (3.17)</td>
<td>.110</td>
<td></td>
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<tr>
<td>3. Factor 3</td>
<td>3.02 (2.12)</td>
<td>-.006</td>
<td>.341**</td>
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<tr>
<td>4. Global Scale</td>
<td>1.52 (5.06)</td>
<td>.457b**</td>
<td>-.685**</td>
<td>-.654**</td>
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</tr>
<tr>
<td>5. Intentions to use ayahuasca in the future</td>
<td>5.26 (5.37)</td>
<td>.095</td>
<td>-.100</td>
<td>-.251**</td>
<td>.136</td>
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<tr>
<td>6. Intentions to use other hallucinogens in the future</td>
<td>2.31 (6.67)</td>
<td>-.207*</td>
<td>-.022</td>
<td>.148</td>
<td>-.193*</td>
<td>.139</td>
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<tr>
<td>7. Intentions to use ayahuasca over other hallucinogens in the future</td>
<td>2.95 (7.98)</td>
<td>.242**</td>
<td>-.048</td>
<td>-.294**</td>
<td>.258**</td>
<td>.557**</td>
<td>-.745**</td>
</tr>
</tbody>
</table>

*Note.* *p < .05, **p < .05