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Psychological variables implied in the therapeutic effect of ayahuasca: a contextual approach.

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## **Abstract**

Ayahuasca is a psychedelic decoction originating from Amazonia. The ayahuasca-induced introspective experience has been shown to have potential benefits in the treatment of several pathologies, to protect mental health and to improve neuropsychological functions and creativity, and boost mindfulness. The underlying psychological processes related to the use of ayahuasca in a psychotherapeutic context are not yet well described in the scientific literature, but there is some evidence to suggest that psychological variables described in psychotherapies could be useful in explaining the therapeutic effects of the brew. In this study we explore the link between ayahuasca use and Decentering, Values and Self, comparing subjects without experience of ayahuasca ( $n=41$ ) with subjects with experience ( $n=81$ ). Results confirm that ayahuasca users scored higher than non-users in Decentering and Positive self, but not in Valued living, Life fulfilment, Self in social relations, Self in close relations and General self. Scores in Decentering were higher in the more experienced subjects (more than 15 occasions) than in those with less experience (less than 15 occasions). Our results show that psychological process variables may explain the outcomes in ayahuasca psychotherapy. The introduction of these variables is warranted in future ayahuasca therapeutic studies.

**Key words:** Ayahuasca; Psychedelics; Decentering; Values; Self; Psychotherapy; Contextual therapy.

## **1. Introduction**

Ayahuasca is the name assigned to both the Amazonian liana *Banisteriopsis caapi* and any type of decoction containing it (Sánchez and Bouso, 2015). In some Amazonian regions where the use of ayahuasca is considered a tradition, decoctions also include leaves from *Psychotrotria viridis* (Rubiaceae) or from *Diplopterys cabrerana* (Malpighiaceae). *B. caapi* contains harmala alkaloids (harmine, harmaline and tetrahydroharmine), which act as MAOI's (monoamine oxidase inhibitors) and *P. viridis* and *D. cabrerana* contain the alkaloid DMT (N,N-Dimethyltryptamine) associated with visionary effects. The combination of both plants results in MAO inhibition due to beta-carboline activity, blocking DMT degradation in the gastrointestinal tract, which allows for uptake by the brain (Riba et al., 2015)

Ayahuasca is used by indigenous Amazonians for ritualistic, religious and ethnomedical purposes (Schultes and Farnsworth, 1980). In recent decades its use has reached an international sphere, it being use for religious, therapeutic and personal growth purposes (Labate and Feeney, 2012). Ayahuasca induces an altered state of consciousness with introspective effects and oneiric-like visions including autobiographic and emotional memories and transpersonal experiences (Bouso and Riba, 2011).

The ayahuasca-induced introspective experience has been shown to have potential benefits for the improvement of several pathologies such as addiction (Nunes et al., 2016; Thomas et al., 2013; Fernández et al., 2014), treatment-resistant depression (Osório et al., 2015; Sanches et al., 2016) and suicidal and aggressive behavior (Frecska, 2008; Grob et al., 1996). Ayahuasca also displays potential mental health protection (Bouso et al., 2012; Grob et al., 1996; Halpern et al., 2008), improved neuropsychological functions (Bouso et al., 2012, 2015; Bouso et al., 2013) and improved creativity (Frecska et al., 2012; Kuypers et al., 2016). Also, cortical thickness in long-term ayahuasca users has been correlated with cognitive capacities and personality traits (Bouso et al., 2015). Potential risks or negative side effects of ayahuasca use when it is used in a safe and supportive setting appear to be negligible. In fact, in none of the studies comparing long-term ritual ayahuasca users with ayahuasca-abstaining controls have worse scores in either psychopathological status or in neuropsychological functioning in ayahuasca users (for a review see dos Santos et al, 2016a) been observed. However there is some anecdotal evidence linking ayahuasca use to negative effects. A recent report described several deaths that occurred in retreat centers in South America, but none of them seem to be directly related to physiological effects of ayahuasca but with physical accidents or crime (Bauer, 2018). A recent systematic review published by our group found three case series and two case reports describing psychotic episodes associated with ayahuasca intake (dos Santos et al., 2017). The incidence of observed psychosis related to ayahuasca use is within the estimate for the general population (Lima et al., 2002).

The underlying psychological processes related to the use of ayahuasca are not well described yet in the scientific literature, but there is some evidence suggesting that variables such as *Decentering*, *Values* and those related to the *Self* could be useful to explain the therapeutic effects of the decoction (Fernández et al., 2014; Soler et al., 2016; Thomas et al., 2013). Stories about subjective perception of ayahuasca benefits usually include references to “ego dissolution”, “higher consciousness of important things”, “contact with oneself”, “improved ability to understand others”, “greater acceptance of oneself and life events”, “capacity of self-observation”, and other similar processes related to personal growth (Bresnick and Levin, 2006).

*Decentering* is defined as “the ability to observe one’s thoughts and feelings in a detached manner, as temporary events in the mind, as neither necessarily true nor reflections of the self” (Kerr et al., 2011; Safran and Segal, 1990). *Decentering* is a relevant construct since it has been pointed out as necessary for healthy cognitive, psychological, and social functioning (Fresco et al., 2007) and could be considered as a transdiagnostic vulnerability factor shared among several mental disorders (Soler et al., 2014). Indeed, high levels of cognitive fusion at baseline predicted earlier relapse in subjects who had recently suffered from major depression (Teasdale et al., 2002) and, along with depression, low levels of *Decentering* has been observed in subjects suffering from borderline personality disorder, eating behaviour disorder and cocaine dependence (Soler et al., 2014).

Regarding *Values*, interventions focused on the work of personal values demonstrated improved response to stressors (Branstetter-Rost et al., 2009; Gregg et al., 2014) and quality of life (McCracken, 2013; Michelson et al., 2011). Shanon (2003) described the attribution of meaning as an effect of ayahuasca on consciousness, particularly aesthetic and transcendent value and transcendent experiences, which are hypothesized by Lester and Prickett (2012) as an important mechanism in the treatment of addictions. Bouso et al. (2012) found higher scores for spiritual orientation and purpose in life in ayahuasca users and Fernández et al. (2014) found positive changes in life attitudes and values in people who received ayahuasca together with psychotherapy in treatment of drug addiction. In this study “*Values*” are conceptualized from a contextual approach as patterns of activity, which are constructed as a result of verbal stimuli that establish reinforcing psychological functions (Wilson et al., 2010). *Values* could be considered as chosen life directions in this sense giving life meaning and purpose and guiding some behaviors (Hayes et al., 2005).

Related to the *Self*, contextual psychotherapies, especially functional analytic psychotherapy (Kolhenberg and Tsai 2007), define the *self* as a private experience of the individual. This experience of “you” that is observing is what we refer as a “*self*”, a central something that is witness to all events, internal or external (Tsai et al. 2009). During the development, the individual learns how to associate internal states with “I” or “me”, but in some cases (for example, in invalidating environments) this association can be altered and the *self* is associated to external stimulus or to a public control. There is a relationship between the public control of the *self* and variables such as low self-esteem or high dissociation (Kanter et al., 2001). Also, clinical samples show higher public

control of the self than control samples (Kanter et al., 2001; Valero-Aguayo et al., 2014). Positive self, referred to positive concepts about one's self, specifically creativity and spontaneity, is also related to wellbeing and is reflected in lower scores in a clinical sample than a non clinical sample (Valero-Aguayo et al., 2014). Past literature has described the effects of ayahuasca on self. Shanon (2003) described phenomenological increases in self-consciousness, changes in the locus of consciousness, in the perceived boundaries of the self and in personal identity. Also Thomas et al. (2013) described a correlation between ayahuasca-assisted therapy for drug addiction treatment and subjective feelings of connection with self. In fact, psychedelics induce a robust effect on "ego-dissolution", a specific psychological effect that is related with mystical experiences (Lebedev et al., 2015) and therapeutic effects (Carhart-Harris et al., 2018). Controlled studies where subjects achieved mystical experiences under the effects of psilocybin showed personal long-term benefits (Griffiths et al., 2008; Griffiths et al., 2011). "Positive self" referred to the capacity to be creative and spontaneous and being comfortable while alone and also in social environments. This is related to the increased cognitive flexibility and could facilitate adaptation to the context, the main objective of most psychotherapies. Previous studies described increases in divergent thinking during the ayahuasca intake (Kuypers 2016) and visual creativity after ritual use of ayahuasca (Frecska 2012). Positive self, is also related to wellbeing and a clinical sample showed lower scores than a non clinical sample (Valero-Aguayo et al., 2014).

Decentering, values, positive self and public control of the self are all variables related to psychological wellbeing and a focus of change in psychotherapeutic interventions. In this study we explore the link between ayahuasca use and Decentering, Values, and the Public control of self with the aim of characterizing the eventual factors that may explain the therapeutic potential of ayahuasca. For achieving this objective, we compared ayahuasca users with non-users using the aforementioned variables. We hypothesize higher scores in Decentering, Values and Positive self among ayahuasca users and lower scores in Public control of self. We also explored whether eventual changes in psychological processes are related to the frequency of ayahuasca use.

## 2. Methods

### 2.1. Participants and study procedure

122 participants completed the assessment scales. From the total participants, 41 had never used ayahuasca (non-users) and 81 had used ayahuasca between 1 and over a 100 times. The ayahuasca group was recruited from associations and collectives of ayahuasca users using the brew for therapeutic, religious or personal growth purposes. All the contextual settings consisted of group ceremonies or sessions. In the therapeutic and/or personal growth settings, the ceremonies usually were guided by a facilitator (generally a psychologist) who previously learnt how to guide ayahuasca sessions in South America. This is a typical setting in most of the ayahuasca ceremonies that take place in Catalonia, the Spanish region where subjects were recruited (Apud & Romaní, 2017). The subjects recruited from religious groups belonged to local groups of the Santo Daime church, an ayahuasca church originally based in

Brazil, which has expanded internationally in recent years (Labate et al., 2009). Thus, the contextual settings of the subjects were always ayahuasca-ritualized ceremonies. None of our subjects took ayahuasca just for recreational purposes or in recreational settings.

The study was conducted in accordance with the Declaration of Helsinki and subsequent amendments concerning research in humans and was approved by the Unió Catalana d'Hospitals Ethics Committee. All volunteers provided their written informed consent to participate.

## 2.2. Questionnaires

### 2.2.1. Descriptive variables:

- Sociodemographic variables: Age, gender, education level, ayahuasca use history, drug history and psychiatric medication.
- Brief Symptom Inventory 18 (BSI-18) (Derogatis, 2001) is a self-report scale that measures psychological distress. Items are rated with a Likert-type scale from 0 (nothing) to 4 (completely). Items are referred to symptoms experienced during the last 7 days. This scale is scored by adding the 18 items to a global severity index and also scores three subscales with six items each: somatization, depression and anxiety. For this study we used the Spanish version by Derogatis (2014).

- Psychoticism scale of the Symptoms Assessment-45 (SA-45-psychoticism) (Davison et al., 1997): has five items related to the last seven days experience measured with a Likert-type scale rated from 0 (nothing) to 4 (completely). For this study we used the Spanish version by Sandín et al. (2008).

### 2.2.2. Psychological processes variables:

- Experiences Questionnaire (EQ) (Fresco et al., 2007) was designed to measure Decentering and rumination. It has 11 items measured with a Likert scale rating from 1 to 5. For this study we used the Spanish version by Soler et al. (2014).

- Engaged Living Scale (ELS) (Trompetter et al., 2013) is a self-report measure with 16 items in a Likert-type scale scoring from 1 to 5. It has two subscales: Valued Living (10 items) and Life Fulfilment (6 items). The scores on Valued Living reflect the recognition and knowledge of personal values and the undertaking of behavioural actions congruent with these values. The Life Fulfilment subscale is composed of items measuring the sense of fulfilment in life as a consequence of recognizing and living in accordance with personal values. For this study we used the Spanish version by Domínguez et al. (2014).

- The Experiencing of Self Scale (EOSS) (Kanter et al., 2001) is a measurement of the public control of the experience of the self and measures to what degree other people influence it. It has 37 items rated in a Likert-type scale rating from 1 to 7. EOSS assesses the self as a private experience with three factors about experiences of the self: in intimate relationships, in casual acquaintances, or a "general self"; with items which refer in all cases to a public

control of self. Also, the EOSS factor of “positive self” contains items about experiences of well-being, specifically creativity and spontaneity. For this study we used the Spanish version by Valero-Aguayo et al. (2014).

### 2.3. Statistical analysis

First, we compared the sociodemographic and descriptive variables between the non-ayahuasca using group and the ayahuasca using group. For categorical variables we used chi square test and *t*-test for quantitative variables. We also compared the two groups in history of substance use with a chi square test and psychopathology indexes with a *t*-test. Decentering, Values and Public control of the experience of self were compared between groups using a *t*-test for independent samples.

Subsequently, to study differences between subjects with low and high ayahuasca use experience, we reorganized subjects in three groups: non-users, subjects with more than 1 ayahuasca experience but less than 15 (AYA 1-15), and subjects with more than 15 ayahuasca experiences (AYA>15). Then we compared sociodemographic and descriptive variables between these new groups with chi square test and ANOVA with Bonferroni post hoc test correction. We compared the groups in Decentering, Values and Public control of the experience of self with an ANOVA with Bonferroni post hoc test correction.

Finally a correlation analysis between the number of ayahuasca experiences and process variables was made.

## 3. Results

The analysis in sociodemographic variables showed no differences in age, gender and education between ayahuasca users and non-users (Table 1).

---Please, insert Table 1---

Related to other substance use, we found that ayahuasca users had a higher ratio of use in the last 12 months of MDMA ( $\chi^2=5.56$ ;  $p=0.018$ ), but there were no differences in the use of cocaine ( $\chi^2=3.13$ ;  $p=0.077$ ), cannabis ( $\chi^2=3.34$ ;  $p=0.068$ ), amphetamines ( $\chi^2=9.66$ ;  $p=0.326$ ), ketamine ( $\chi^2=0.05$ ;  $p=0.824$ ), opiates ( $\chi^2=0.97$ ;  $p=0.326$ ), LSD or other hallucinogens ( $\chi^2=2.47$ ;  $p=0.116$ ) in the last 12 months. There were no differences between the groups in somatisation ( $t=0.71$ ;  $p=0.479$ ), depression ( $t=0.48$ ;  $p=0.635$ ), anxiety ( $t=1.118$ ;  $p=0.226$ ) or the general index of BSI ( $t=60$ ;  $p=0.550$ ) and in psychoticism ( $t=0.48$ ;  $p=0.633$ ).

Regarding the process variables, the group of ayahuasca users scored higher in Decentering and Positive self. There were no differences in Valued living, Life fulfilment, Self in general, Self in social relations or Self in close relations (Table 2).

---Please, insert Table 2---

After separating subjects who had experience with ayahuasca into two groups (subjects with less than 15 experiences and subjects with more than 15

experiences), both groups were compared again with the non-using group. The analysis in sociodemographic variables showed differences in age with higher mean age in the group with more experience but there were no differences in gender or education level between groups (Table 3). There were no differences between groups in Somatisation, Anxiety, Depression or Psychoticism. When comparing the three groups examining the consumption of other substances in the last six months, significant differences were observed only in the consumption of MDMA, with a higher consumption among the subjects with less than 15 experiences of ayahuasca ( $\chi^2=8.80$ ;  $p=0.012$ ).

---Please, insert Table 3---

Comparing the three groups we observed significant differences in Decentering between the non-using group and AYA>15, and between AYA 1-15 and AYA>15. AYA 1-15 scored lower than AYA>15 in Valued living and higher in Self in social relations. AYA 1-15 scored higher also than both non-users and AYA>15 in Self in general.

---Please, insert Table 4---

Correlations between the number of experiences with ayahuasca and Decentering, Valued living, Life fulfilment, Self in general, Self in social relations, Self in close relations and Positive self were not significant (Table 5).

---Please, insert Table 5---

#### **4. Discussion**

Although ayahuasca has been internationally popularized as a personal growth enhancing spiritual tool (Kjellgren et al., 2009), and there is some evidence confirming its psychotherapeutic potential (dos Santos et al., 2016b; Sanches et al., 2016), little research has been conducted in attempting to understand the psychological processes, or factors, that may explain its outcome effects (Soler et al., 2016; Thomas et al., 2013). In this study, we compared non-ayahuasca users with ayahuasca users in Decentering, Values and Public control of the experience of self, as well in classical psychopathological measures.

As an initial result, there were no differences in psychopathology indexes of Somatisation, Depression, Anxiety and Psychoticism between users and non-users. These results are in consonance with previous studies conducted in different cultural settings and countries where ayahuasca users did not show differences in psychopathology measures compared to non-users (Barbosa et al., 2016; Bouso et al., 2012, 2015).

Regarding the process variables, ayahuasca users scored higher than non-users in Decentering, but when ayahuasca users were separated into two subsamples, only the users that had taken ayahuasca on more than 15 occasions scored higher than non-users and subjects with less experience. This result is in consonance with the only previous study using a measurement of Decentering where an improvement was found 24 hours after an ayahuasca experience compared with baseline (Soler et al., 2016). In that study the average number of ayahuasca experiences of the sample was 79. In contrast to these data, a previous study comparing a sample of cocaine users with a non-

clinical sample, showed significantly lower scores in the group of consumers (Soler et al., 2014, data not shown).

The increase in the ability to observe thoughts and feelings as temporary events in the mind, instead of seeing them as being true, has been suggested as an underlying mechanism that partially explains the beneficial effects of therapies such as Mindfulness Based Cognitive Therapy (MBCT) (Bieling et al., 2012) or Cognitive Behavioral Therapy (CBT) (Teasdale et al., 2002). Some data suggest that increases in Decentering may be particularly useful in preventing relapse on those receiving MBCT, and it is interesting to note that those patients treated only with antidepressant medications were also protected but changes in Decentering were observed (Bieling et al., 2012). In the same direction, with disorders such as Borderline Personality Disorder (BPD), both increases in Decentering and a reduction of BPD symptoms following Mindfulness intervention have been observed (Elices et al., 2016).

Regarding 'Values', the other psychological process variable studied here, there are many personal reports from ayahuasca users referring to the ayahuasca experiences as transformative ones that can be manifested as changes in personal values (Kavenská and Simonová, 2015). Previous studies found self-reported changes in life attitudes and changes in personal values and life meaning after the administration of different doses of psilocybin (Griffiths et al., 2008; Griffiths et al., 2011), and differences in life purpose and related variables in long-term ayahuasca users (Barbosa et al., 2016; Bouso et al., 2012). According to those studies, although we did not observe differences between ayahuasca users and non-users in Valued living and Life fulfilment, we found that subjects with more experience in ayahuasca use scored higher than subjects with less experience in Valued Living.

Lastly, differences between ayahuasca users and non-users in 'Public control of the experience of self' was not confirmed. Only scores in Positive self show differences between ayahuasca users and non-users, referred to creativity, spontaneity and a positive concept about one's self. After dividing the group of consumers into two groups and comparing non-users with users more than 15 times and users less than 15 times, we observed that subjects with less than 15 experiences with ayahuasca indicated a self more dependent on others in Social relations than subjects with more than 15 experiences, and also a self more dependent on others in 'General' than subjects with more than 15 experiences and naïve subjects.

The positive self sub-index is formed by items that refer to creativity and spontaneity of the individual. Results when comparing subjects with and without experience in ayahuasca consumption are similar to previous studies that describe enhancement of creativity after ayahuasca consumption (Frecksa 2012). 'Positive self' is not a construct described in contextual models, characterized by giving more importance to the function of thoughts than to their positive or negative content, but in this case, 'Positive self' refers to creativity and spontaneity that in our opinion is related to flexibility of adaptation, the main objective of psychotherapies, especially ACT. Changes in personality after psychedelic experiences are also described in other studies. Recent research has found changes in the personality domain of 'Openness to experience'

months after the administration of psilocybin (MacLean et al., 2011) and few weeks after an LSD (Lysergic Acid Diethylamide) experience (Carhart-Harris et al., 2016), as well as in a recent study comparing personality traits between regular ayahuasca users and non-users (Barbosa et al., 2016). Another study comparing personality traits between long-term ayahuasca users and non-users showed higher scores in the former of “Self-transcendence” (Bouso et al., 2012), a personality trait highly correlated with Openness to experience (De Fruyt et al., 2000).

The lower values reported by the less experienced ayahuasca users in “Valued living” and in some variables of “Public control of self” can reflect a state that motivates the search for solutions to issues via the consumption of ayahuasca. It can also reflect the crises described in the beginning of the psychedelic therapy process, where subjects question their previous behavior when they have low self-esteem and little in the way of defense mechanisms (Twemlow and Bowen, 1979). The higher scores in Decentering in experienced subjects would support this long-term therapeutic effect.

According to this, the ayahuasca-induced experience would not only be related to a cathartic reaction, but it would be integrated as part of a positive self, allowing these benefits to be integrated as part of daily life. Regarding this, another phenomena related to the research of the self that should be investigated in the future is the possible adverse effect of psychedelics known as “ego inflation” (Nour et al., 2016) in order to have more knowledge regarding the practical consequences of the transformation in the self that can be observed in ayahuasca and/or other psychedelic users.

One of the limitations of this study is that the evaluation was performed solely with self-report questionnaires. We think that it would be very interesting to explore more specific measurements to evaluate changes in consciousness in daily life and behavioural regulation through values as it could be changes in diet, conception of spiritual world, family, job, etc., that are contributing to changes. Another limitation of the study is the lack of information about the context, dosage and acute effects of ayahuasca use. In naturalistic studies it is difficult to assign the results observed specifically to ayahuasca usage, it being impossible to separate the pharmacological effects of ayahuasca from the context and the ritual setting. None of our study subjects took ayahuasca just for recreational purposes or in recreational settings. One last limitation related to the retrospective approach of this study is that it is also impossible to know if some of the differences found are because of ayahuasca use or because of pre-existing personality traits, or even to the differences due to MDMA use in the last 12 months between groups, since MDMA has shown promising results as a coadjutant in psychotherapy processes (Feduccia et al., 2018). Thus, the retrospective nature of self-report questionnaires in a potentially heterogeneous sample may further limit the generalizability of the results. Future prospective studies should be conducted to investigate this issue.

To summarize, these results confirm that ayahuasca use is related to a basic process linked to therapeutic change: Decentering. Given these results we may assume that more sessions would result in a better outcome on the target processes, but this is not confirmed since we did not find any correlation

between the number of sessions and measurements of Decentering, Values or Self. It is likely that variables such as individual differences, context of use, and the post session integration work are very important for the optimization of the therapeutic effects of ayahuasca. Other authors have emphasized the importance of the setting where ayahuasca is used in order to produce a therapeutic effect (Frecska et al., 2016). We think that previous work focusing on the openness to experience, ability of observation, a low interventionist but attentive guide and a post session integration process with a metacognitive and validation approach could improve the therapeutic effect of the substance. It is necessary to continue studying the implicated factors in the therapeutic efficiency of ayahuasca use, both relating to the drug itself and the inner and outer context of the subject.

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## Tables

Table 1: Sociodemographic data.

	<b>Non-users</b> <i>n=41</i>	<b>Ayahuasca users</b> <i>n=81</i>	<b>X<sup>2</sup></b>
Gender			3.256
Male	34.9%	51.9%	
Female	65.1%	48.1%	
Studies			5.932
Basic	2.4%	16.3%	
Bachelor or equivalent	12.2%	8.7%	
Professional training	17.1%	10%	
University	68.3%	65%	
	$\bar{x}$ (s.d)	$\bar{x}$ (s.d)	<i>t</i>
Age	42.4 (12.3)	41.7 (9.3)	0.325

Table 2: Mean comparisons between ayahuasca users and non-users in psychological measures.

	<b>Non-users (n=41)</b>	<b>Ayahuasca users (n=81)</b>	
	$\bar{x}$ (s.d.)	$\bar{x}$ (s.d.)	<i>t</i>
EQ (decentering)	40.29 (5.73)	42.82 (6.30)	2.280*
Valued living	38.86 (6.40)	38.89 (6.55)	0.103
Life fulfilment	21.11 (5.44)	21.85 (4.83)	0.809
Self in social relations	16.70 (6.99)	17.94 (10.10)	0.699
Self in close relations	26.74 (12.14)	24.44 (11.33)	1.156
Self in general	24.00 (6.79)	26.00 (9.56)	1.266
Positive self	26.00 (7.57)	28.78 (7.02)	2.272*

\* $p \leq 0.05$

Table 3. Sociodemographic characteristics in the three groups.

	<b>Non-users</b> <i>n=44</i>	<b>AYA 1-15 times</b> <i>n=44</i>	<b>AYA &gt;15 times</b> <i>n=37</i>	$\chi^2$
Gender				4.84
Male	34.9%	45.5%	59.5%	
Female	65.1%	54.5%	40.5%	
Studies				9.43
Basic	2.4%	11.6%	21.6%	
Bachelor or equivalent	12.2%	11.6%	5.4%	
Professional training	17.1%	7%	13.5%	
University	68.3%	69.8%	59.5%	
Age, $\bar{x}$ (s.d)	42.39 (12.32)	38.89 (7.48)	45.14 (10.22)	$F = 3.87^*$

 $*p \leq 0.05$

Table 4: ANOVA between the three groups.

	Non-users	AYA	1-15	AYA>15	F	Post	hoc
	$\bar{x}$ (s.d)	times		times		with	
			$\bar{x}$ (s.d)	$\bar{x}$ (s.d)			Bonferroni
EQ	40.29 (5.73)	40.88 (6.20)		45.08 (5.71)	7.59**	0< +15** 1-15 <+15*	
Valued Living	38.86 (6.36)	36.73 (6.62)		41.46 (5.54)	5.81**	1-15 <+15*	
Life fulfilment	21.12 (5.44)	21.36 (4.99)		22.43 (4.64)	0.747		
Self social relations	16.71 (6.99)	20.25 (11.75)		15.19 (6.90)	3.44*		
Self close relations	26.74 (12.14)	26.40 (12.64)		22.11 (9.18)	1.96		
Self general	24.00 (6.77)	28.48 (10.16)		23.05 (7.95)	4.89*	1-15 >+15* 0<1-15*	
Positive self	26.00 (7.57)	28.68 (6.28)		28.89 (7.89)	2.07		

\* $p \leq 0.05$ ; \*\* $p \leq 0.005$

Table 5. Pearson correlations between the number of ayahuasca experiences and the psychological measures.

	EQ (Decentering)	Valued living	Life fulfilment	Self social	Self close	Self general
Number of experiences (1-100)	0.175	0.151	0.107	-0.004	-0.056	-0.098