

Holotropic Breathwork Can Occasion Mystical Experiences in the Context of a Daylong Workshop

La Respiración Holotrópica Puede Provocar
Experiencias Místicas en el Contexto de un Taller de un día

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Abstract

The purpose of the present study was to explore the subjective effects of Holotropic Breathwork (HB), specifically looking at the incidence of mystical experiences or peak experiences, in a Russian sample in the context of a daylong workshop. A single group design was used. A total of 134 subjects, aged 18-64 years, participated in the study. The *States of Consciousness Questionnaire* (SCQ) was administered to determine the incidence of mystical or peak experiences. Thirteen of the 134 participants (9.7%) met criteria for a “complete” mystical experience. The higher scores were found in deeply felt positive mood, transcendence of time and space and internal unity subscales of the SCQ. We found similar scores in the CEC to those found in a previous study in people under the influence of 5mg/70kg and 10mg/70kg of psilocybin.

Keywords: holotropic breathwork, states of consciousness questionnaire, mystical experience, peak experience, transpersonal psychology

Resumen

El presente estudio tiene como objetivo principal explorar los efectos subjetivos de la respiración holotrópica, centrándose específicamente en la incidencia de experiencias místicas o experiencias cumbre, en una muestra de voluntarios rusos obtenida en Moscú, en el marco de un taller de respiración holotrópica un día de duración. Se utilizó un diseño de un solo grupo. Un total de 134 sujetos, de entre 18-64 años, participó en el estudio. Se administró el Cuestionario de Estados de Consciencia (CEC) para determinar la incidencia de las experiencias místicas o experiencias cumbre. Trece de los 134 participantes (9,7%) en el estudio cumplieron con los criterios para una experiencia mística “completa”. Las puntuaciones más altas se encontraron en las subescalas “estado de ánimo positivo sentido profundamente”, “trascendencia del tiempo y el espacio” y “unidad interna” del CEC. Encontramos resultados similares en el CEC a los encontrados en un estudio previo en personas bajo la influencia de dosis de 5mg/70kg y 10mg/70kg de psilocibina.

Palabras clave: respiración holotrópica, cuestionario de estados de consciencia, experiencia mística, experiencia cumbre, psicología transpersonal

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Introduction

Transpersonal psychology was born in 1968 in the US by a group of psychologists, psychiatrists and psychotherapists (including Anthony Sutich, Abraham Maslow, Stan Grof and James Fadiman) to expand the framework of humanistic psychology beyond its focus on the individual self, including also the study of the spiritual and transcendent dimension of human nature and existence (Grof, 2000; Ferrer, 2003).

Etymologically, the term transpersonal means "beyond" or "through" the personal, and is used to refer to motivations, experiences, developmental stages, modes of being, concerns and other phenomena that include but also transcend the sphere of individual personality, the self or ego (Ferrer, 2003). Among its core interests are transpersonal processes, values and states, unitive consciousness, peak experiences, ecstasy, mystical experience, transcendence, the theories and practices of meditation, spiritual paths, and concepts, experiences and activities related to it (Walsh and Vaughan, 1982). A brief but comprehensive definition was offered by Rowan, who believes that the main goal of transpersonal psychology would be the demarcation of the borders and the varieties of the conscious human experience (Rowan, 1996). Thus, transpersonal psychology has been interested in the study of mystical experiences since the beginning of its existence (Grof, 2012; Maslow, 1964, 1969; Sutich, 1969).

During the last decades different ways to measure mystical experiences has been developed. In general, the field of mystical experience research is characterized by a lack of uniformity regarding definitions, methods and instrumentation (Lukoff and Lu, 1988). Different authors have proposed different criteria and characteristics to define this experience, including William James (1986), Evelyn Underhill (1993), W. Stace (1960), R. C. Zaehner (1961), A. Maslow (1968) and Walter Pahnke (1963, 1966), and different questionnaires have been developed to measure this experience (Hood, 1975; Pahnke, 1963). Among the most used questionnaires to measure mystical experiences we can find the Hood Mysticism Scale and the Peak Experience Profile (also known as the States of Consciousness Questionnaire and the Mystical Experience Questionnaire), both based in the characterizations of the features of mystical experiences provided by Stace (1960).

The modern empirical study of mysticism has focused on measuring the mystical experiences that individuals have had across their lifetime. The most widely used quantitative measure of lifetime

mystical experiences is the Hood Mysticism Scale (HMS) (Hood, 1975; Hood and Williamson, 2000). The HMS has been shown to be a reliable and cross-culturally valid measure of lifetime experiences (Chen et al, 2012; Hood et al, 2001), although recent research suggested the existence of cultural differences in the specific structure of mystical experience (Chen, Hood et al, 2011; Chen, Qi, et al., 2011).

The Peak Experience Profile (PEP) was originally developed in the 1960s by Walter Pahnke (1963, 1966, 1969) with the aim of measuring and for the evaluation of the potential single mystical experiences occasioned by psilocybin. The PEP was developed based on the classic descriptive work on mystical experiences and the psychology of religion by Stace (1960), and covers the main dimensions of classic mystical experience which he describes: 1) unity (external and internal), 2) transcendence of time and space, 3) alleged ineffability, 4) paradoxicality (claim of difficulty in describing the experience in words), 5) sense of sacredness, 6) objectivity and reality (claim of intuitive knowledge of ultimate reality), 7) deeply felt positive mood, and 8) transiency. The criteria established for considering a volunteer as having had a "complete" mystical experience were that the scores on each of the following scales had to be at least 60 to 70 percent: unity (either internal or external, whichever was greater), transcendence of time and space, ineffability, paradoxicality, sense of sacredness, objectivity and reality, deeply felt positive mood and transiency. Pahnke performed a double-blind experiment to determine if the administration of high doses of psilocybin with an appropriate environment and preparation could produce or induce mystical experiences. The author found that the participants who received psilocybin experience more intensely the phenomenon that was described and characterized as mystical experience. Specifically, he found that four of the ten subjects who received psilocybin reached the 60 to 70 percent level of completeness, whereas none of the controls did (Pankhe, 1963; Pankhe, 1966).

The original version of the PEP questionnaire used by Pahnke has been modified and expanded over the years by Pahnke, William Richards, Franco Di Leo and Richard Yensen for its use in subsequent psychedelic research (Di Leo, 1982; Richards, 1975). New categories measuring transpersonal but not necessarily mystical experiences were added (Doblin, 1991). A modified version of the questionnaire, the States of Consciousness Questionnaire (SCQ) was developed and administered recently by Griffiths et al (2006, 2008, 2011) to conduct a number of studies to cha-

racterize the mystical-type effects of psilocybin using double-blind and placebo controlled methodologies. In 2012, MacLean et al. (2012) performed a factor study of the SCQ, examining the factor structure of this questionnaire.

During the 1960s a new way to work with psychedelics in psychotherapy was developed in Canada and the United States, called "psychedelic psychotherapy". In this type of psychotherapy the goal was to induce mystical experiences in the participants of the studies, giving high doses of LSD and other psychedelics in a very controlled and safe setting, using a few sessions with psychedelics (between one and five), and a number of preparation and integration psychotherapy sessions without psychedelics. A number of studies using this new methodology were conducted at Spring Grove during the 1960s and the early 1970s. In some of these studies the researchers used the PEP to measure the appearance of mystical experiences (Pahnke, 1967; Richards et al, 1977).

In the paper "Implications of LSD and Experimental Mysticism", Pahnke and Richard (1966) described the changes found in people who have mystical experiences or peak experiences in the following way:

"Persons who have experienced the contents of the eight categories discussed above are also known to report concomitant changes in attitudes (1) towards themselves, (2) toward others, (3) toward life, and (4) toward mystical consciousness itself. Increased personality integration is reported, including a renewed sense of personal worth coupled with a relaxation of habitual mechanisms of ego defense... One feels as though personal problems can now be so confronted that they may finally be reduced or eliminated. One's faith in one's own potential for creative achievement tends to be increased, at least at the subjective level. In one's relationships with other persons, greater sensitivity, increased tolerance, and more real compassion are reported. Theologically trained persons frequently feel that they have acquired new and profound insights into the meaning Martin Buber sought to convey in his term <the I-Thou relationship>, finally knowing the meaning of genuinely meeting another person without the subtle masks that separate man from man. Changed and enlarged attitudes towards life are reported in the areas of deeper sensitivity to values that are felt to be eternal, increased sensitivity to an inner imperative that seeks expression through other-centered behavior, increased vocational com-

mitment, loss of a fear of death coupled with an expanded awareness of the significance of historical existence, and an enriched appreciation for the whole of creation. As an expression of these attitudes, more time may be spent in meditation. The memory of mystical consciousness itself is regarded, as deeply meaningful and similar experiences may be sought as a source of growth and strength.

Although attitudinal and behavioral changes such as these are subjectively reported by psychedelic subjects who have experienced the content of the preceding eight categories, the duration and permanence of such changes and the extent to which they are manifested in everyday existence are topics in need of extensive research. Only after such research is completed can the degree of correspondences between the positive changes claimed by psychedelic subjects and the effects of spontaneous life-enhancing mystical experiences be determined" (Pahnke and Richards, 1966: 76-77).

The recent studies conducted by Ronald Griffiths and William Richards team at the Department of Neuroscience at Johns Hopkins University have replicated and extended these results (Griffiths et al, 2006, 2008, 2011). Griffiths et al (2006) conducted a double-blind study evaluating the immediate (7h) and medium term effects (2 to 14 months) of a high dose of psilocybin at a psychological level and in the state of mood, compared with an active placebo, administered in a comfortable atmosphere and with therapeutic support. Griffiths et al found that psilocybin produced a "complete" mystical type experience in 61% of the volunteers (in 22 of the 36 subjects who participated in the study). At 2 months, volunteers rated the experience as very significant personally and spiritually, and attributed sustained positive changes in their attitudes and behavior. In 2008 Griffiths et al published another article describing the persistent, long-term effects that these experiences had on volunteers, 14 months later. They conclude that, when administered in a comfortable setting and with interpersonal support, psilocybin produces mystical type experiences similar to spontaneous mystical experiences, and that these experiences are considered by the volunteers among the most personally and spiritually significant experiences of their lives 14 months after the experience.

Griffiths et al (2011) also conducted a dose-effect study with psilocybin in 18 volunteers, using 4 different doses of the substance in 4 sessions

conducted at intervals of one month. Griffiths et al found that the percentage of volunteers who had a complete mystical experience increased with the dose (being 0, 5.6, 11.1, 44.4 and 55.6 for doses of 0, 5, 10, 20 and 30mg/70kg respectively). They also found that, in high doses, volunteers considered the experience with psilocybin as very significant personally and spiritually, 1 month and 14 months after the session. They also found that the acute and persistent effects of the psilocybin increased depending on the dose.

Historically, the PEP and the SCQ has been used to measure the subjective effects of psilocybin and other classic psychedelic compounds, and several studies have demonstrated the sensitivity of this questionnaire to the effects of psilocybin, LSD and other psychedelics (Pahnke, 1963, 1966, 1967, 1969; Pahnke and Richards, 1966; Richards et al, 1972, 1977; Turek, Soskin and Kurland, 1974). Nevertheless, it has rarely been used for the evaluation of the potential mystical experiences occasioned by other techniques employed in the context of the transpersonal psychology and psychotherapy, such as Holotropic Breathwork.

Holotropic Breathwork (HB) is a technique developed and used in the context of the transpersonal psychology to induce non-ordinary states of consciousness and transpersonal experiences. HB was developed in the mid 70's by Stanislav Grof, one of the founders of the Transpersonal Psychology movement, (Grof, 1988, 2000; Grof and Grof, 2010) at the Esalen Institute, California, after two decades working with LSD and other psychedelic substances in psychotherapy (Grof, 1972, 1973, 1975, 1980). This method was conceived as a non-drug way of accessing non-ordinary states of consciousness and, specifically, a subgroup of NOSC called "holotropic states", a neologism proposed by S. Grof. The word "holotropic" is derived from the Greek words "holos" and "trepein", and means "moving toward wholeness" (Grof, 2000). According to Grof, the HB can induce different kinds of transpersonal experiences, including mystical experiences, among others (Grof, 1985; Grof and Grof, 2010). Grof claims are based in more than three decades of work with this technique, and in the anecdotic observations and subjective reports of many of the participants in his workshops and HB sessions.

HB is a novel, experientially oriented, therapeutic technique that involves a number of diverse elements, including music, elective bodywork and accelerated breathing. HB sessions usually last between 2 and 3 hours, and are terminated voluntarily by the client. Both individual and group therapies are possible, but the group therapy

context is the most commonly used. The most characteristic and unique element of this procedure, compared with other psychotherapeutic methods, is the prolonged, voluntary hyperventilation or overbreathing (Rhinewine and Williams, 2007), which can be sustained longer than an hour, but all the cited elements are considered mandatory in the HB procedure.

To date, few studies have examined empirically the potential of this hyperventilation procedure to produce mystical experiences, giving some preliminary evidence (Puente, 2014a; Puente, 2014b). Puente (2014a; 2014b) conducted some preliminary research exploring the subjective effects of HB using the SCQ in the context of a weeklong workshop. In a first study Puente (2014b) explored the effects of HB on levels of distress, meaning of life, death anxiety and personality in a young adult sample, aged 18-35, in the context of a weeklong workshop, and also the subjective effects and persistent effects of HB, using a battery of tests. A single group, Pre-Post test design, with a 12-month follow-up was used. A total of 29 subjects, aged 18-35 years, participated in the study. The tests used include the *States of Consciousness Questionnaire* (SCQ). 29 of the participants in the study filled out the SCQ after their first HB session during the workshop. Puente found that HB occasioned mystical-type or peak experiences in 6 participants (20.7% of the participants who filled out the SCQ) during their first HB session during the workshop (each participant had two HB sessions during the weeklong workshop). Three of the volunteers that had a "complete" mystical experience were "first breathers", and the other three had previous experience with the HB. The higher scores were found in the ineffability (0.58), intuitive knowledge (0.5) and deeply felt positive mood (0.46) subscales of the SCQ.

In a similar study Puente (2014a) explored the effects of HB in the context of a weeklong workshop on levels of distress, meaning of life, death anxiety and personality, and also the subjective effects and persistent effects of HB, using a battery of tests, including the SCQ. The SCQ was filled out after the two HB sessions that each participant had during the workshop. After the first HB session (N=37) three participants had a complete mystical experience (the 8.11% of the participants who filled out the SCQ). The higher scores of the SCQ were obtained on "deeply felt positive mood" (0.55 above 1), ineffability (0.51 above 1) and sacredness (0.49 above 1) dimensions. After the second HB session (N=29) four participants had a complete mystical experience (the 13.8% of the participants who filled out the SCQ). The high-

er scores of the SCQ were obtained, again, on “deeply felt positive mood” (0.59 above 1), ineffability (0.55 above 1) and sacredness (0.55 above 1) dimensions. All the participants who had a complete mystical experience were naïve in the use of HB, and did not have any previous experience with the technique.

This preliminary evidence encourages the author of the present study to conduct additional research on the subjective effects of HB, specifically exploring the occurrence of mystical experiences during the practice of this technique. The aim of the present pilot study was to explore the subjective effects of HB in a Russian sample in the context of a daylong experiential workshop. The study analyzed the relationship between the use of HB and the occurrence of mystical type or peak experiences during the HB sessions. Based on previous research, it was hypothesized that participants in the HB daylong workshop would report mystical-type or peak experiences occasioned by the HB.

Method

Participants

In this pilot study, a convenient sample was used. Eligible participants were individuals enrolled in a daylong HB workshop held during the 14th International Transpersonal Association (ITA) Conference in Moscow, in two big rooms of the conference venue. Eligibility criteria were as follows: aged +18 years, Russian speaking and able to provide informed consent. Both “first breathers” (participants who were exposed to HB for the first time in their life) and those who have previous experience with HB were allowed to take part in the research. No control group was used in the present study.

All the participants of the daylong workshop who completed the inclusion criteria (N=412) were approached about participating in the study. From all the participants of the workshop, 136 individuals consented and filled out the SCQ after their HB session as breathers. We were successful in obtaining complete data in 134 individuals (32.5% of the eligible subjects).

Participants in the study who completed the questionnaires (N=134) age ranged between 18 and 64 years (Mean=32.9, S.D. =8.8). Eighty of the participants were female (59.7%) and fifty-four were male (40.3%). 48 participants were “first breathers” (35.8%), and another 86 have previous

experience with HB (64.2%). The level of studies was above average, and 85.0% has university studies.

Table1. Age, gender, education and previous experience with HB for the study volunteers.

		<i>Pre measure</i> (N=134)
<i>Age</i>		32.9 (8.8)
<i>Gender</i>	Man	54 (40.3%)
	Woman	80 (59.7%)
<i>Education</i>	College finished	114 (85.0%)
	College unfinished	10 (7.5%)
	High School	2 (1.5%)
	Primary studies	8 (6.0%)
<i>HB experience</i>	RH Yes	86 (64.2%)
	RH No	48 (35.8%)

Study design

In the present study a single group design was used. The variables examined were measured using the *States of Consciousness Questionnaire* (SCQ), to explore the subjective effects of the participants during their HB session as breathers. The SCQ was assessed 1 to 5 hours after the HB session of the volunteers in which they have the breather role.

Psychometric measures/materials

The variable examined was measured with the *States of Consciousness Questionnaire* (SCQ). The SCQ is a self-assessed 100-item questionnaire, which was designed to assess mystical experiences based on the classic descriptive work on mystical experiences and the psychology of religion by Stace (1960). It provides scale scores for each of seven domains of mystical experiences: internal unity (pure awareness; a merging with ultimate reality); external unity (unity of all things; all things are alive; all is one); transcendence of time and space; ineffability and paradoxicality (claim of difficulty in describing the experience in words); sense of sacredness (awe); noetic quality (claim of intuitive knowledge of ultimate reality); and deeply felt positive mood (joy, peace, and love). The data on each scale were expressed as a proportion of the maximum possible score, fixed in 1. Based on prior research (Pahnke, 1969), the criteria for considering a volunteer as having had a “complete” mystical experience were that the scores on each of the following scales had to be at least 0.6:

unity (either internal or external, whichever was greater), transcendence of time and space, ineffability and paradoxicality, sense of sacredness, noetic quality, and deeply felt positive mood. Forty-three items on this questionnaire comprised the Pahnke–Richards Mystical Experience Questionnaire (Pahnke, 1969; Richards 1975), and the remaining 57 items in the questionnaire served as distracter items.

Procedure

The data were collected the first day of the 14th ITA Conference, during a daylong HB workshop. The workshop was held at the conference venue in Moscow in June 2010, and the researcher stayed at the workshop all the day to collect the data. Permission to conduct the study was requested from and granted by the organizer and the directors of the workshop. After the introductory talk of the workshop, all the Russian participants aged +18 were invited to participate in the research and to fill out a consent form, a socio-demographic survey and the SCQ. Participants were told that the study was part of the researcher's study on HB. Participation in the study was completely voluntary. Written informed consent was obtained prior to the assessments. The questionnaire and survey took around 20–30 minutes to fill out. No compensation was offered for participation in the study.

Results

Data analyses

The data were statistically analyzed for the 134 volunteers who completed the SCQ using the 17.0 version of SPSS.

Measure of the Subjective effects of the HB assessed during the workshop.

134 of the participants in the study filled out the SCQ after their HB session during the workshop. Eighty of the participants were female (59.7%) and fifty-four were male (40.3%). 86 participants were “first breathers” (64.2%), and another

48 have previous experience with HB (35.8%). Based on prior criteria, 13 of the total group of 134 volunteers (9.7%) had a “complete” mystical experience during the HB session. Eight of the volunteers that had a “complete” mystical experience were “first breathers”, and the other five had previous experience with HB. The higher scores were found in deeply felt positive mood (0.57), transcendence of time and space (0.43) and internal unity (0.43) sub-dimensions of the SCQ (see Table 2 and Figure 1).

Table 2. Volunteers ratings ($N=134$) on the States of Consciousness Questionnaire (SCQ) completed 1 to 5 hours after their HB session.

Subscale description	HB session (N=134)
Internal unity	0.43 (0.29)
External unity	0.39 (0.3)
Transcendence of time and space	0.43 (0.23)
Ineffability	0.4 (0.25)
Sacredness	0.37 (0.25)
Noetic quality	0.42 (0.27)
Deeply felt positive mood	0.57 (0.26)
“Complete” mystical experience	13 (9.7%)

Note: Data are mean scores with the SD shown in parentheses. For the seven sub-dimensions of the States of Consciousness Questionnaire, data are expressed as a proportion of the maximum possible score.

Discussion

The purpose of the present study was to explore the subjective effects of a single HB session in a Russian sample in the context of a day-long workshop. The overall results of this study suggests that HB, administered to healthy individuals in the context of a day-long workshop, is capable of occasioning “complete” mystical experiences. Thus, the study provides some initial positive findings regarding the possible usefulness of this technique to induce mystical experiences in the context of a daylong workshop.

Figure 1: scores of the 7 dimensions of the SCQ, expressed as a proportion of the maximum possible score, fixed in 1.

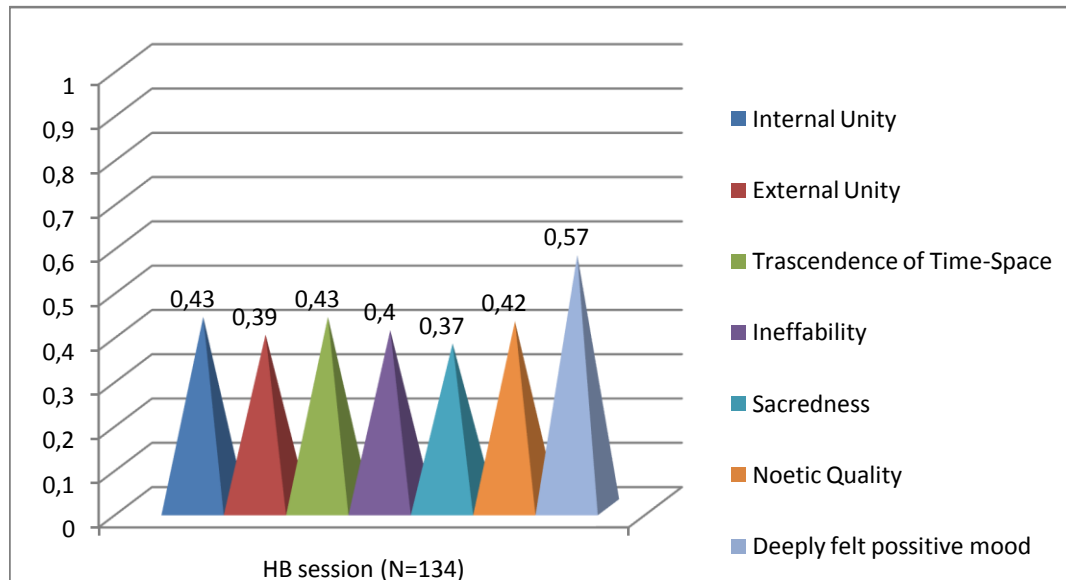


Table 3. Comparison between volunteers ratings on the SCQ after their HB session and the ratings for the 5mg/70kg and 10mg/70kg psilocybin doses obtained by Griffiths et al (2011) in their dose-response study.

SCQ sub-dimensions and total score	HB session (N=134)	Psilocybin 5mg (N=18)	Psilocybin 10mg (N=18)
Internal unity	0.43	0.38	0.45
External unity	0.39	0.32	0.35
Transcendence of time and space	0.43	0.40	0.44
Ineffability	0.4	0.48	0.59
Sacredness	0.37	0.49	0.54
Noetic quality	0.42	0.47	0.54
Deeply felt positive mood	0.57	0.48	0.57
“Complete” mystical experience	13 (9.7%)	N=1 (5.6%)	N=2 (11.1%)

Note: For the seven sub-dimensions of the States of Consciousness Questionnaire, data are expressed as a proportion of the maximum possible score, fixed in 1.

In the present study, thirteen of the 134 participants (9.7%) met criteria for “complete” mystical experience in the SCQ. This rate is comparable to those found in previous research on HB in an adult sample in the context of a weeklong

workshop (8.11% after the first HB session, and 13.8% after the second HB session) (Puente, 2014a), but lower than the rate found in a previous research on HB in a young adult sample, aged 18-35, in the context of a weeklong workshop (20.7% of the participants who filled out the SCQ after the first HB session) (Puente, 2014b). Compared with the rate of mystical experiences obtained in the different studies using high doses of psilocybin (40% found by Panhke, and 61% found by Griffiths et al), the percentage of participants who met criteria for “complete” mystical experience in the SCQ is lower during HB. If we look to the percentages of mystical experiences obtained by Griffiths et al (2011) in their dose-effect study with psilocybin (being 0, 5.6, 11.1, 44.4 and 55.6 for doses of 0, 5, 10, 20 and 30mg/70kg respectively), the percentage obtained in the present study (9.7%) is similar to the 10mg/70kg psilocybin dose (11.1) obtained by Griffiths et al (see table 3).

Eight of the thirteen volunteers who have a “complete” mystical experience were “first breathers” (61.5%), and the other five had previous experience with HB (38.5%). This data might suggest that subjects who have no previous experience with the HB technique may be more likely to have a mystical experience, especially if we consider that the 64.2% of the participants in the study have previous experience with the HB, and only 35.8% were first breathers. Thus, the 16.7% of the “first breathers” who participate in the study (8 of 48) met criteria for “complete” mystical experience in

the SCQ, versus the 5.8% of the participants with previous experience with HB (5 of 86). This finding is partially consistent with previous research on the topic. Puente (2014a) found a similar outcome in a study exploring the effects of HB in the contexts of a weeklong workshop in an adult sample, in which all the participants who had a complete mystical experience were first breathers. However, in another study exploring the effects of HB in a young adult sample, aged 18-35, in the context of a week-long workshop (Puente, 2014b), three of the volunteers who have a “complete” mystical experience were “first breathers”, and the other three had previous experience with the HB.

In the present study, the higher scores were found in deeply felt positive mood (0.57), transcendence of time and space (0.43) and internal unity (0.43) subscales of the SCQ. The high score in the “deeply felt positive mood” subscale (0.57 above 1) might indicate that the subjective experience during the HB session is remembered and assessed as having an overall positive tone, more than a negative one. Puente also found that the higher scores of the SCQ were obtained on “deeply felt positive mood” (0.55 above 1) in a previous study (Puente, 2014a), followed by ineffability (0.51 above 1) and sacredness (0.49 above 1). In another study (Puente, 2014b) deeply felt positive mood (0.46) subscale obtained the third higher score, after ineffability (0.58) and intuitive knowledge (0.5).

The results obtained in the present study also support Grof’s claims of the potential of HB to induce mystical experiences (Grof, 1985). Therefore, the outcomes found in the SCQ during the HB session in the present study seem to confirm Grof’s statement of the potential of HB to induce similar experiences to those found when he was working with psychedelics (Grof and Grof, 2010). We found that HB can induce mystical experiences of the same type as those produced by psilocybin, although less frequently and in a smaller percentage of participants (Griffiths et al, 2006). Furthermore, our results indicate that the percentage of participants having mystical experiences during a HB session is similar to the percentage obtained by Griffiths et al. (2011) using a 10mg/70kg psilocybin dose (11.1%).

Despite some initial positive findings suggesting that the use of HB in the context of a day-long workshop might induce mystical experiences, some limitations can be pointed also to the present study. First, a convenient sample was used for the present study, and there was no comparison group. Thus, we cannot draw cause-effect statements from it. Second, the 134 participants of the present study

only represents around the 30-33% of the total number of participants of the workshop. Thus, these results cannot be generalized to all the participants of the daylong workshop, or to other contexts where the HB is used, but they do support the idea that HB may contribute to induce mystical type or peak experiences in these specific samples.

Nevertheless, it is remarkable that HB occasioned mystical-type or peak experiences in some participants during the workshop, because the present study is the first to measure these kinds of experiences using the SCQ during a daylong HB session. It is also remarkable that almost one out of each of the ten volunteers who filled out the SCQ had a complete mystical experience (the 9.7%), considering the relative low frequency of these kinds of experiences in other contexts. Similar outcomes have been found in human research with psychedelic compounds like LSD and psilocybin (Grof, 2001; Griffiths et al., 2006, 2008; MacLean et al. 2011; Pahnke, 1963, 1967). These experiences have been related to improvements in several mental health measures (Grof, 2001; Griffiths et al., 2006, 2008).

Conclusions and future projects

Further research into the subjective effects, and the short and long-term effects of HB is needed. There are a number of areas of potential interest that might be examined in future research, including the assessment of physiological and neurophysiologic variables, and the use of qualitative methodology, to try to find correlations between them, the subjective experiences of the participants during the HB sessions as breathers and specifically with the occurrence of mystical experiences. We also believe that the setting, the context surrounding the experience, is very important in relation to the subjective effects that this technique can induce. Thus, future research examining the degree to which these results are specific to the context is needed. The development of similar studies in other contexts where HB and other similar hyperventilation procedures are used could be very fruitful.

Despite its limitations, and recognizing the exploratory nature of this pilot study, our results shows that HB occasioned mystical experiences in some of the volunteers in the context of a day-long workshop. These preliminary results give support for further research on the subjective effects induced by this technique, as well to the study of the possible link between this subjective effects and the possible increase on wellbeing and life satisfac-

tion of the people who report mystical experiences during the HB sessions.

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