

# Phenomenological characteristics of auto-induced cognitive trance and Mahorikatan<sup>®</sup> trance

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## Abstract

Trance states include various practices characterized by a modulation of consciousness, but with their own specific characteristics and induction techniques. They have been very seldom scientifically studied, and their phenomenological similarities and differences are poorly documented. This paper will focus on two types of Western trances developed after the leaders were trained in traditional shamanic communities: the auto-induced cognitive trance (AICT) and the Mahorikatan<sup>®</sup> trance (MT). Twenty-five AICT and 26 MT participants who were able to self-induce the trance state completed questionnaires about their trance practice (e.g. context of the first trance episode, frequency of practice, and consequences on personal life) and the phenomenological characteristics (i.e. emotional, physical, and cognitive) of the trance episodes they experienced. These characteristics were compared to explore similarities and differences between the two trance states. AICT and MT are characterized by the expression of different emotions, modification of various perceptions, a feeling of unicity (i.e. being completely oneself), and an expansion of consciousness. AICT participants commonly reported body movements, vocalizations, as well as increased creativity, visions of entities and/or places, and feeling of interaction with the environment. MT participants commonly reported a feeling of body dissolution. Most participants in both groups reported positive effects of their trance practice on their personal life. These results helped characterize AICT and MT, as well as their similarities and differences. Further studies should continue to explore the characteristics of such trance states, as well as their potential clinical applications.

**Keywords:** non-ordinary state of consciousness; auto-induced cognitive trance; Mahorikatan trance; shamanic trance; phenomenology

## Introduction

There is no consensual definition of consciousness. It can be understood as “a state of awareness of the self and environment” (Plum and Posner 1982) and as “the existence of subjective experience and inner mental life” (Chalmers 1995, Block 2005). Non-ordinary states of consciousness (NSCs) can be defined as “experiences that arise spontaneously or are induced by practices and/or rituals, and can have considerable cultural and eudemonic (i.e. denoting well-being and meaning in life) significance” (Timmermann et al. 2023). NSCs induce some shifts in experiential contents (i.e. what appears to the experiencer) and/or structure (i.e. perception of time and/or space, sense of agency and/or

ownership). They are generally transient but can also induce long-lasting transformation by impacting cognition and physical and mental health (Timmermann et al. 2023). Contrary to the prevalent belief, NSCs are extremely common (Bourguignon 1973, Flor-Henry et al. 2017). Some of these states are sometimes referred to as “trance.” Trance can be defined as “an absorptive state of consciousness induced by an event that makes subjects lose their usual references, which modify the way they perceive reality and leave them with an unusual, atypical, and transitory feeling” (Bioy 2023). However, it is an umbrella-term including a variety of practices and experiences, each of them having their specific cultural roles and induction methods. In the last decades, there

Received 24 August 2023; revised 25 March 2024; accepted 17 May 2024

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has been a growing interest in shamanism, especially in Western culture. This led to the transformation of practices inherited from traditional cultures into practices without any traditional ritual feature, accessible to everyone, and considered as a spiritual way of life, usually called “neo-shamanism.” These practices foster personal and communal empowerment through different trainings allowing the participants to induce the trance state voluntarily (Wallis 1999, 2000). Some recent studies started to investigate the phenomenological characteristics of different trance states (see Grégoire et al. (2021) for a review). For example, shamanic trance seems to be characterized by a modification of body-image, time perception, and visual perceptions as well as a complex imagery and a feeling of unity and happiness (Hove et al. 2016, Huels et al. 2021). Other trance states exist, such as the medimistic trance (i.e. spiritism), which has been associated with motor, sensory, or cognitive automatism, an alteration of the sense of self, a sense of depersonalization, and visual and auditory hallucinations (Mainieri et al. 2017). Common characteristics of these trance states generally include increased absorption and dissociation, as well as a spiritual dimension. However, these few studies do not allow any clear conclusion regarding the similarities and the differences between various trance states. While many trance states exhibit common traits, the experiences during trance can vary among practitioners, and it remains unclear whether different induction techniques would lead to a same trance state. Thus, describing in detail the phenomenological correlates of different trance states, and eventually comparing them, seems particularly relevant as it will allow to better characterize and understand these NSCs, leading to numerous scientific and clinical perspectives.

This paper will focus on two types of Western trances, developed after the leaders trained in traditional shamanic communities: the auto-induced cognitive trance (AICT, previously called self-induced cognitive trance) and the Mahorikatan® trance (MT). Following their training, these leaders subsequently offered workshops to instruct participants in entering trance states. We will describe these two practices in the “Materials and Methods” section. Our aim is to describe in detail the characteristics of each trance state on several levels: emotional, physical, and cognitive, as well as the psychological, physical, and social consequences of the trance practice.

## Materials and Methods

### Recruitment

Participants were recruited through the leaders of the group workshops (C.S. and P.L.). Participants were asked if they were interested in participating in our study, and if so, questionnaires were directly transmitted to them by the group leader or by the experimenter. Inclusion criteria were  $\geq 18$  years old and being able to voluntarily induce the trance state (i.e. AICT or MT), without drug consumption or the help of a guide or therapist. No sample size was calculated before the start of this study as it was based on the number of people who had participated or were participating in the AICT and MT workshops at the moment of the study. All procedures performed in this study were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The study was approved by the Hospital-Faculty Ethics Committee of Liege (N°B707201940324), with each participant providing written consent.

### Description of the workshops

AICT has been developed by C.S., when she spontaneously entered a trance state when assisting to a shamanic ritual in Mongolia. After 8 years of training in Mongolia, she became the first Western “ugdan” (female shaman in Mongolia) and is now considered as an international expert on AICT (Sombrun 2006, 2012). This trance state is induced first through the listening of sound-loops (i.e. binaural sounds with pure tones between 100 Hz and 200 Hz and beating rates lower than 10 Hz combined with serial music sequences and voice sounds) and then voluntarily through body movements and/or vocalizations. The AICT training is composed of two 2-day workshops, spaced by 2 weeks, in groups up to 20 participants. A part of the first session is devoted to give information about AICT, how it can be induced and the organization of the workshops. Possible questions from the participants are then discussed. During the first day, participants generally listen to different sound-loops (~30 min each), lying on the ground with their eyes closed. They are quickly encouraged to let the trance state manifest itself spontaneously through different means (e.g. vocalizations, movements, yawn, feeling of warmth or cold, eyelid fluttering, eye movements), notably by different team members (i.e. the “facilitators”) who may be in trance themselves during these moments. Different kinds of trances are taught during the workshops: trances with intention, during which participants follow an intention [e.g. refocusing on oneself (“anchor trance”), finding one’s place and being assertive (“inner place trance”), reconnecting with one’s inner power (“empowerment trance”)], and trances without intention (“free trances”), during which participants let themselves and their body get carried away by the experience of trance. During some exercises, participants are also encouraged to draw or write. Each day, four to five AICT exercises are proposed. Every exercise is discussed in group and participants are asked to practice at home between the workshops. At the end of the two workshops, all participants generally have found a way to self-induce AICT, i.e. without the help of the trainer or the sound-loops (basically with the help of their own specific trance induction pattern, like a movement or vocalization, then without). They can generally practice in various positions, both with eyes open or closed. AICT is starting to be studied scientifically, and the first case studies reported an increased dissociation and absorption, a modified sense of time and self, modified perceptions (e.g. pain, auditory and visual hallucinations), motor automatism, strong emotions, spiritual experience, and strength modifications (Flor-Henry et al. 2017, Gosseries et al. 2020). Another study on 27 AICT practitioners showed that this state was characterized by the expression of strong positive emotions (e.g. joy), bodily sensations, modified perceptions, as well as visions of animals, people, or natural elements (Vanhaudenhuyse et al. under review). Finally, another study found that AICT was associated with a reduction in parasympathetic activity, suggesting a hyperarousal state of the autonomic nervous system during this NSC (Oswald et al. 2023).

MT is based on the expertise of P.L. (Lenaif 2004, 2007, 2012). He became interested in mind-body approaches, shamanism, trance, and dance during his recovery from a ski accident. Since 1993, he has been experiencing, in parallel, many different types of trances, including spontaneous shamanic trance with Power Animals (i.e. guidance with the spirit of an animal), the spiritual mediumship trance into the Afro-Brazilian religious tradition of Umbanda (Brazil), in which he is now *Pai de Santo* (worship leader), and the trance by reduction of vigilance and of muscle tone. He developed MT from all these combined experiences, with on one side the desire to get out of both the shamanic context and the

framework of a religious tradition, and on the other side the aim to give MT a form specific to European culture, supported by a philosophy based on a Jungian approach (Jung 1995). MT is a slow dance combined with music, allowing the induction of a trance state. The MT training is offered in workshops ranging from half a day to 4 days, held in 3-hour sessions, in groups of 10 to 50 participants. Regular participants usually attend between 8 and 12 days of practice during the year. The session begins with a presentation of trance in general, the specificity of MT, such as its induction through slow dance, and the interest of trance in the context of personal development. Access to MT is done by progressive reduction of vigilance through music programmed according to a precise scheme. The music, chosen by the team leader, is of all styles (jazz, pop, rock, classical, reggae, ethnic, etc.) and included in a reference catalog. It meets specific criteria (e.g. emotional content, physiological effect, quality of arrangement, recording, musical prolepsis, level of vitality, tempo) and must induce physiological and/or emotional positive or joyful responses and invite the participants to move. The session starts with dynamic music tracks with fast tempos (i.e. Phase 1: "Joy and celebration", inviting the participants to move and dance), followed by music tracks with slow to extremely slow tempos (i.e. Phase 2: "Harmonization and return to oneself"; inducing a slowing down of the movements and an intimacy with oneself), according to a strict framework. The session ends with tracks chosen according to a given emotional theme, which is variable between sessions. They can be peaceful as well as dynamic (i.e. Phase 3: "Trance/healing", during which uncontrolled movements may occur as a result of the trance state). The music track that presides over entry into trance is always the same. The participants are then instructed to let themselves slip into the trance state and observe, without intervening, their non-voluntary movements. All trances are performed standing, eyes closed, and team members are present to ensure the security of the participants, especially when they walk with their eyes closed. The trance sequences vary from 10 to 35 minutes. At the end of each one of them, a moment of exchange about the experiences is proposed to the group. Several successive trance sequences are possible in a single session. MT has not been studied yet.

During AICT and MT workshops, the safety of the participants is ensured by different team members who are experts in AICT or MT.

## Assessments

Assessments were based on questionnaires developed by our team and C.S. based on previous reports of AICT practitioners, with the primary aim of better characterizing the phenomenology of AICT. Except for the sociodemographic questionnaire, most questions were answered by "yes" or "no", and the participant had the possibility to give more details if wanted.

- (i) Sociodemographic data: assesses age, sex, family situation, education level, nationality, cultural origin, and current spiritual/religious practices.
- (ii) History of experiences altering consciousness: assesses past and current alcohol, drug, and psychedelics consumption, as well as history of coma, life-threatening situations, near-death experiences (NDEs), or physical or psychological traumas.
- (iii) Questionnaire about the trance practice: assesses the regularity of trance practice, as well as the context of the first trance episode, and the characteristics of the self-induction technique. Mean duration of trance episodes was also assessed through the following response categories:

between 10 s and 2 min, between 2 and 15 min, between 15 and 60 min, and more than 60 min.

- (iv) Phenomenological characteristics of the trance state: assesses the subjective experience during trance states on three domains: emotional (e.g. expression of emotions), physical (e.g. modification of physical strength, action on a sick or painful body part), and cognitive (e.g. amplified attention, modification of memory access, emission of an unknown language, visual hallucinations). These three dimensions include 48 items in total. All reported items can be added to calculate a "diversity score" ranging from 0 (no item reported) to 48 (all items reported). A higher score indicates a higher diversity of the trance experience, with more features reported, while a lower score indicates a lower diversity of the experience. Another dimension concerned the possible consequences of trance practice on psychological (e.g. fears, feeling of being different), physical (e.g. weight, performance), and/or social (e.g. interactions, private and professional life) domains. For each item, the participants were asked to consider their trance practice in general and not a specific trance episode. They also had the possibility to write additional information if wanted.

## Statistical analyses

Descriptive analyses were used to describe the two groups at the sociodemographic and phenomenological levels using Statistica 13.3 (TIBCO Software Inc.). Note that only the phenomenological characteristics reported by at least 70% of the participants from one specific group will be discussed in the text (the other ones being presented in the table only). In the same way, the main similarities between the two trance states discussed in the text will be based on the characteristics reported, or not reported, by at least 70% of the participants from the two groups.

## Results

### Description of the sample

Fifty-one participants were included in this study: 25 in the AICT group and 26 in the MT group. Table 1 details the sociodemographic characteristics of the participants and their past experiences altering consciousness. Most participants were women (84% in AICT and 73% in MT group), single, or divorced/widowed (68% and 73% in the AICT and MT groups, respectively). Participants tended to be a bit younger in the AICT group compared to the MT group (44.8 vs. 53.4 years old). Most of the sample reported having religious or spiritual practices (56% vs. 81%). Most of the sample had no history of alcohol or drug abuse, but 44% of the AICT group and 31% of the MT group reported a history of psychedelic consumption, which is much higher than the general population (estimated at 15% (Center for Behavioral Health Statistics and Quality 2016)). Some participants also reported an episode of coma, life-threatening situations, or NDE, but psychological or physical traumas (e.g. rape, death of a loved one, accident, aggression) were the most represented (40% in AICT and 58% in MT group).

### Characteristics of the trance practice

Table 2 describes the characteristics of the trance practice of the participants in the total sample and in each group. Almost half of the sample had a regular practice (i.e. continuous practice with no break, since the workshop) of trance at the time of the study (47% in the total sample, 44% in AICT and 50% in the MT group). Most participants had been practicing trance for several years at

**Table 1.** Sociodemographic characteristics and experiences altering consciousness in the total sample and in both groups

	Total sample (N = 51)	AICT (N = 25)	MT (N = 26)
<b>Demographics</b>			
<b>Age (years)</b>			
Mean (SD)	49.06 (12.0)	44.8 (13.8)	53.4 (8.1)
Range	23–71	23–71	40–70
95% confidence interval	[10.0–15.0]	[10.8–19.2]	[6.3–11.3]
<b>Sex, N (%)</b>			
Men	11 (22)	4 (16)	7 (27)
Women	40 (78)	21 (84)	19 (73)
<b>Marital status, N (%)</b>			
Single	24 (47)	13 (52)	11 (42)
Married/living with partner	15 (29)	8 (32)	7 (27)
Divorced/widowed	12 (24)	4 (16)	8 (31)
<b>Nationality, N (%)</b>			
Belgian	20 (39)	12 (48)	8 (31)
French	28 (55)	13 (52)	15 (58)
Other	3 (6)	0	3 (12)
<b>Cultural origin, N (%)</b>			
Occidental	47 (92)	22 (88)	25 (96)
Other	4 (8)	3 (12)	1 (4)
<b>Education level, N (%)</b>			
Secondary school	3 (6)	1 (4)	2 (8)
Bachelor's degree	8 (16)	5 (20)	3 (12)
Master's degree	33 (65)	14 (56)	19 (73)
PhD	7 (14)	5 (20)	2 (8)
<b>Current spiritual or religious practice, N (%)</b>			
Yes	35 (69)	14 (56)	21 (81)
No	14 (27)	10 (40)	4 (15)
Missing data	2 (4)	1 (4)	1 (4)
<b>History of experiences altering consciousness</b>			
<b>Regular alcohol consumption (current or past), N (%)</b>			
Yes	2 (4)	2 (8)	0
No	49 (96)	23 (92)	26 (100)
<b>Regular drug consumption (current or past), N (%)</b>			
Yes	4 (8)	3 (12)	1 (4)
No	47 (92)	22 (88)	25 (96)
<b>Psychedelics consumption (current or past), N (%)</b>			
Yes	19 (37)	11 (44)	8 (31)
No	32 (63)	14 (56)	18 (69)
<b>History of coma, N (%)</b>			
Yes	10 (20)	6 (24)	4 (15)
No	40 (78)	19 (76)	21 (81)
Missing data	1 (2)	/	1 (4)
<b>History or life-threatening event, N (%)</b>			
Yes	10 (20)	4 (16)	6 (23)
No	39 (76)	21 (84)	18 (69)
Missing data	2 (4)	/	2 (8)
<b>History of NDE, N (%)</b>			
Yes	10 (20)	3 (12)	7 (27)
No	41 (80)	22 (88)	19 (73)
<b>History of physical or psychological trauma, N (%)</b>			
Yes	25 (49)	10 (40)	15 (58)
No	26 (51)	15 (60)	11 (42)

SD, standard deviation.

the time of the study, even though the time elapsed since the first trance episode (3.6 years in AICT vs. 8.2 years in MT) and the duration of regular practice (3.8 years in AICT vs. 4.9 years in MT) were higher in the MT group compared to the AICT group. More precisely, for most participants, the first trance episode

**Table 2.** Characteristics of the trance practice

	Total sample (N = 51)	AICT (N = 25)	MT (N = 26)
<b>Regular practice of trance, N (%)</b>			
Yes	24 (47)	11 (44)	13 (50)
No	27 (53)	14 (56)	13 (50)
<b>Time since first trance episode (in years)</b>			
Mean (SD)	6.0 (6.8)	3.6 (5.3)	8.2 (7.3)
Range	0–28	0–22	1–28
95% confidence interval	[5.6–8.5]	[4.1–7.5]	[5.7–10.3]
<b>Number of years of regular practice</b>			
Mean (SD)	4.3 (5.6)	3.8 (7.4)	4.9 (3.0)
Range	0–34	0–34	1–10
95% confidence interval	[4.6–7.0]	[5.7–10.4]	[2.3–4.2]
<b>Duration of the longest trance episode (in min)</b>			
Mean (SD)	69.7 (75.3)	103.3 (82.5)	21.8 (15.4)
Range	0.1–330	23–330	0.1–60
95% confidence interval	[60.7–99.1]	[62.7–120.5]	[11.2–24.8]
<b>Modification of the self-induction technique over time, N (%)</b>			
Yes	27 (53)	19 (76)	8 (31)
No	23 (45)	6 (24)	17 (65)
Missing data	1 (2)		1 (4)

SD, standard deviation.

happened during the AICT or MT workshop they participated in. However, some participants had experienced a previous trance episode in other contexts such as individual initiation and ritual ceremonies (e.g. shamanic ceremony or Umbanda ritual) or after an emotional shock. The mean duration of trance episodes was highly variable among individuals, but the longest trance episodes were reported in the AICT group (mean duration = 103.3 min in AICT vs. 21.8 min in MT). These episodes never exceeded 60 min in the MT group. To note, in both groups, most participants reported experiencing trance episodes of various durations (i.e. from less than 1 to 15 or more minutes). Finally, the self-induction technique learnt during the workshop changed with regular practice, notably in the AICT group (76% in AICT vs. 31% in MT). In the AICT group, the primary self-induction technique most generally involved movements (e.g. tremors, movements of the arms, hands or face, and body sways) and sounds (e.g. animal screams, unknown language, and laugh). For most AICT participants, the evolution of this self-induction technique was characterized by the addition or suppression of some movements, the addition of specific sounds, or a reduced duration before entering the trance state. In the MT group, the self-induction technique generally involved a reduction of body tensions, slow movements, focus of the attention on a specific point, and listening to music.

### Phenomenological characteristics of AICT and MT

Table 3 displays the phenomenological characteristics reported by the participants to describe the trance state they have been practicing. When considering the total sample, some features were reported by most participants (i.e.  $\geq 70\%$  of the total sample): the expression of emotions during the trance state (82%), the modification of sensory perceptions (78%), kinesthesia (76%), time perception (88%), and space perception (82%), and feelings of being completely oneself (82%), of expansion of consciousness (80%), and of a flow of energy (76%). Some features were also reported by very few participants (i.e. answered “no” by  $\geq 70\%$  of the total

**Table 3.** Phenomenological characteristics of the trance state in both groups and in the total sample

	Total sample (N = 51)	AICT (N = 25)	MT (N = 26)
<b>Emotional changes during trance</b>			
<b>Access to psychological injuries or traumatic memories, N (%)</b>			
Yes	30 (59)	17 (68)	13 (50)
No	21 (41)	8 (32)	13 (50)
<b>Expression of emotions, N (%)</b>			
Yes	42 (82)	20 (80)	22 (85)
No	9 (18)	5 (20)	4 (15)
<b>Physical changes during trance</b>			
<b>Modifications of the sensory perceptions (i.e. visual, olfactory, tactile, gustatory, auditory, proprioceptive), N (%)</b>			
Yes	40 (78)	19 (76)	21 (81)
No	11 (22)	6 (24)	5 (19)
<b>Amplified perception of past or current physical injuries, N (%)</b>			
Yes	11 (22)	6 (24)	5 (19)
No	40 (78)	19 (76)	21 (81)
<b>Action on a painful or sick body part, N (%)</b>			
Yes	23 (45)	15 (60)	8 (31)
No	28 (55)	10 (40)	18 (69)
<b>Eructation, N (%)</b>			
Yes	18 (35)	13 (52)	5 (19)
No	33 (65)	12 (48)	21 (81)
<b>Modification of physical strength, N (%)</b>			
Yes	22 (43)	17 (68)	5 (19)
No	29 (57)	8 (32)	21 (81)
<b>Modification of pain perception, N (%)</b>			
Yes	29 (57)	17 (68)	12 (46)
No	22 (43)	8 (32)	14 (54)
<b>Modification of kinesthesia (i.e. (de)contraction of some body parts), N (%)</b>			
Yes	39 (76)	18 (72)	21 (81)
No	12 (24)	7 (28)	5 (19)
<b>Tingling, N (%)</b>			
Yes	17 (33)	12 (48)	5 (19)
No	34 (67)	13 (52)	21 (81)
<b>Modification of heart rate, N (%)</b>			
Yes	17 (33)	9 (36)	8 (31)
No	34 (67)	16 (64)	18 (69)
<b>Modification of respiration, N (%)</b>			
Yes	31 (61)	18 (72)	13 (50)
No	20 (39)	7 (28)	13 (50)
<b>Modification of body temperature, N (%)</b>			
Yes	20 (39)	12 (48)	8 (31)
No	31 (61)	13 (52)	18 (69)
<b>Tremor, N (%)</b>			
Yes	23 (45)	15 (60)	8 (31)
No	28 (55)	10 (40)	18 (69)

(continued)

**Table 3.** (Continued)

	Total sample (N = 51)	AICT (N = 25)	MT (N = 26)
<b>Reflex movements, N (%)</b>			
Yes	21 (41)	16 (64)	5 (19)
No	30 (59)	9 (36)	21 (81)
<b>Rapid eye movements, N (%)</b>			
Yes	15 (29)	12 (48)	3 (12)
No	36 (71)	13 (52)	23 (89)
<b>Onset of menstruations after a trance session, N (%)</b>			
for women only (N <sub>total</sub> = 40; N <sub>AICT</sub> = 21; N <sub>MT</sub> = 19)			
Yes	13 (32.5)	5 (24)	8 (42)
No	27 (67.5)	16 (76)	11 (58)
<b>Orgasm during trance, N (%)</b>			
Yes	5 (10)	3 (12)	2 (8)
No	46 (90)	22 (88)	24 (92)
<b>Trance triggered by an orgasm, N (%)</b>			
Yes	15 (29)	10 (40)	5 (19)
No	34 (67)	14 (56)	20 (77)
Missing data	2 (4)	1 (4)	1 (4)
<b>Feeling of leaving one's body, N (%)</b>			
Yes	10 (20)	7 (28)	3 (12)
No	41 (80)	18 (72)	23 (89)
<b>Feeling of body dissolution (e.g. "I am melting", "I become "nothing"), N (%)</b>			
Yes	34 (67)	13 (52)	21 (81)
No	17 (33)	12 (48)	5 (19)
<b>Cognitive changes during trance</b>			
<b>Modification of time perception, N (%)</b>			
Yes	45 (88)	21 (84)	24 (92)
No	6 (12)	4 (16)	2 (8)
<b>Modification of space perception, N (%)</b>			
Yes	42 (82)	19 (76)	23 (88)
No	9 (18)	6 (24)	3 (12)
<b>Modification of self-perception, feeling of being possessed, N (%)</b>			
Yes	33 (65)	21 (84)	12 (46)
No	18 (35)	4 (16)	14 (54)
<b>Modification of perceptions other than sensory (e.g. intuition, flow of energy, emotional perceptions), N (%)</b>			
Yes	21 (41)	11 (44)	10 (39)
No	30 (59)	14 (56)	16 (62)
<b>Feeling of interaction with the environment, N (%)</b>			
Yes	31 (61)	22 (88)	9 (35)
No	20 (39)	3 (12)	17 (65)
<b>Perception of dissonances<sup>a</sup>, N (%)</b>			
Yes	19 (37)	13 (50)	6 (23)
No	32 (63)	12 (48)	20 (77)
<b>Feeling that the trance state participated in repairing these dissonances, N (%)</b>			
Yes	27 (53)	17 (68)	10 (39)
No	24 (47)	8 (32)	16 (62)

(continued)

Table 3. (Continued)

	Total sample (N = 51)	AICT (N = 25)	MT (N = 26)
<b>Feeling of a presence, N (%)</b>			
Yes	26 (51)	15 (60)	11 (58)
No	25 (49)	10 (40)	15 (42)
<b>Feeling of being someone else, N (%)</b>			
Yes	8 (16)	5 (20)	3 (12)
No	43 (84)	20 (80)	23 (89)
<b>Feeling of being completely oneself (i.e. unicity), N (%)</b>			
Yes	42 (82)	18 (72)	24 (92)
No	9 (18)	7 (28)	2 (8)
<b>Amplified access to inaccessible (or difficulty accessible) information, N (%)</b>			
Yes	27 (53)	16 (64)	11 (42)
No	24 (47)	9 (36)	15 (58)
<b>Expansion of consciousness, N (%)</b>			
Yes	41 (80)	22 (88)	19 (73)
No	10 (20)	3 (12)	7 (27)
<b>Feeling of a flow of energy, N (%)</b>			
Yes	39 (76)	22 (88)	17 (65)
No	12 (24)	3 (12)	9 (35)
<b>Increased creativity, N (%)</b>			
Yes	25 (49)	19 (76)	6 (23)
No	26 (51)	6 (24)	20 (77)
<b>Amplified attention, N (%)</b>			
Yes	29 (57)	19 (76)	10 (39)
No	22 (43)	6 (24)	16 (62)
<b>Come back of memories, N (%)</b>			
Yes	8 (16)	5 (20)	3 (12)
No	43 (84)	20 (80)	23 (89)
<b>Sensibility to others, N (%)</b>			
Yes	31 (61)	21 (84)	10 (39)
No	20 (39)	4 (16)	16 (62)
<b>Dialogue with another living being (i.e. human, animal, vegetal) or an inanimate object, N (%)</b>			
Yes	18 (35)	16 (64)	2 (8)
No	33 (65)	9 (36)	24 (92)
<b>Mediumistic abilities, N (%)</b>			
Yes	14 (27)	10 (40)	4 (15)
No	37 (73)	15 (60)	22 (85)
<b>Telepathy (e.g. transmission of thoughts, acquisition of information about a distant person or animal), N (%)</b>			
Yes	7 (14)	6 (24)	1 (4)
No	44 (86)	19 (76)	25 (96)
<b>Remote viewing (e.g. visions of distant places, sometimes allowing the acquisition of information), N (%)</b>			
Yes	6 (12)	6 (24)	0
No	45 (88)	19 (76)	26 (100)
<b>Visions of entities, animals, landscapes, or places, known or unknown, real or unreal, N (%)</b>			
Yes	21 (41)	18 (72)	3 (12)
No	30 (59)	7 (28)	23 (89)

(continued)

Table 3. (Continued)

	Total sample (N = 51)	AICT (N = 25)	MT (N = 26)
<b>Production of sounds, N (%)</b>			
Yes	25 (49)	23 (92)	2 (8)
No	26 (51)	2 (8)	24 (92)
<b>Production of songs, N (%)</b>			
Yes	23 (45)	23 (92)	0
No	28 (55)	2 (8)	26 (100)
<b>Production of an unknown language, N (%)</b>			
Yes	22 (43)	22 (88)	0
No	29 (57)	3 (12)	26 (100)
<b>Production of an existing but not learned language, N (%)</b>			
Yes	6 (12)	6 (24)	0
No	45 (88)	19 (76)	26 (100)
<b>Production of screams, N (%)</b>			
Yes	21 (41)	21 (84)	0
No	30 (59)	4 (16)	26 (100)
<b>Diversity score</b>			
Mean (SD)	22.2 (10.7)	28.4 (10.7)	16.2 (6.7)
Range	4–44	5–44	4–32
95% confidence interval	[9.0–13.4]	[8.4–14.9]	[5.2–9.2]
<b>Consequences of the trance state</b>			
<b>Recall of physical injuries, N (%)</b>			
Yes	8 (16)	4 (16)	4 (15)
No	43 (84)	21 (84)	22 (85)
<b>Recall of psychological injuries, N (%)</b>			
Yes	36 (71)	15 (60)	21 (81)
No	15 (29)	10 (40)	5 (19)
<b>Recall partial amnesia, N (%)</b>			
Yes	5 (10)	3 (12)	2 (8)
No	46 (90)	22 (88)	24 (92)
<b>Participation in the repair of these injuries/amnesia, N (%)</b>			
Yes	35 (69)	17 (68)	18 (69)
No	16 (31)	8 (32)	8 (31)
<b>Consequences on the body, N (%)</b>			
Yes	22 (43)	11 (44)	11 (42)
No	28 (55)	13 (52)	15 (58)
Missing data	1 (2)	1 (4)	
<b>Consequences on the psyche, N (%)</b>			
Yes	35 (69)	14 (56)	21 (81)
No	15 (29)	10 (40)	5 (19)
Missing data	1 (2)	1 (4)	
<b>Consequences on the alimentation, N (%)</b>			
Yes	13 (25)	9 (36)	4 (15)
No	37 (73)	15 (60)	22 (85)
Missing data	1 (2)	1 (4)	
<b>Consequences on possible addictions, N (%)</b>			
Yes	1 (2)	1 (4)	0
No	49 (96)	23 (92)	26 (100)
Missing data	1 (2)	1 (4)	

(continued)

Table 3. (Continued)

	Total sample (N = 51)	AICT (N = 25)	MT (N = 26)
<b>Consequences on private life, N (%)</b>			
Yes	37 (73)	17 (68)	20 (77)
No	13 (25)	7 (28)	6 (23)
Missing data	1 (2)	1 (4)	
<b>Consequences on professional life, N (%)</b>			
Yes	34 (67)	19 (76)	15 (58)
No	16 (31)	5 (20)	11 (42)
Missing data	1 (2)	1 (4)	
<b>Consequences on social relationships, N (%)</b>			
Yes	38 (74)	19 (76)	19 (73)
No	12 (24)	5 (20)	7 (27)
Missing data	1 (2)	1 (4)	
<b>Consequences on relationship with the environment, N (%)</b>			
Yes	34 (67)	19 (76)	15 (58)
No	16 (31)	5 (20)	11 (42)
Missing data	1 (2)	1 (4)	
<b>Learning due to the trance practice, N (%)</b>			
Yes	46 (90)	22 (88)	24 (92)
No	2 (4)	0	2 (8)
Missing data	3 (6)	3 (12)	
<b>Feeling of being different, N (%)</b>			
Yes	47 (92)	22 (88)	25 (96)
No	2 (4)	1 (4)	1 (4)
Missing data	2 (4)	2 (8)	

<sup>a</sup>Perception of discordances between the observation of the external environment and/or a person and the internal subjective sensations. SD, standard deviation.

sample): amplified perception of past or current physical injuries (78% answered “no”), rapid eye movements (71% answered “no”), orgasm during trance (90% answered “no”), a feeling of leaving one’s body (80% answered “no”) or of being someone else (84% answered “no”), the comeback of memories (84% answered “no”), telepathy (86% answered “no”), remote viewing (88% answered “no”), production of an existing but not learned language (88% answered “no”), and recall of physical injuries (84% answered “no”) or of partial amnesia (90% answered “no”).

Even if it is noteworthy that our methodology does not allow for a statistical comparison of AICT and MT characteristics (due to lack of randomization and self-selection of the participants, for examples), our observations suggest several differences between the two trance states. Indeed, some characteristics were particularly reported in the AICT group: modifications of respiration (72% vs. 50%), modifications of self-perception (e.g. feeling of becoming an animal, of being outside the body, of being possessed; 84% vs. 46%), a feeling of interaction with the environment (e.g. communication with animals, plants, or other persons; 88% vs. 35%), an increase in creativity (76% vs. 23%), attention (76% vs. 39%), and sensibility to others (84% vs. 39%), as well as visions of different kinds (e.g. animals, landscapes, lights; 72% vs. 12%). During AICT, participants frequently reported producing sounds (92%), songs (92%), screams (84%), and unknown languages (88%), while no participant from the MT group reported these features. Other noteworthy features tended to be more reported during

AICT, even if they were less common: modification of physical strength (68% vs. 19%), appearance of reflex movements (64% vs. 19%) or rapid eye movements (48% vs. 12%), and dialogue with another living being or an inanimate object (64% vs. 8%). Concerning MT, the feeling of body dissolution was particularly reported compared to AICT (81% vs. 52%). Participants also reported that MT revealed the existence of psychological injuries (e.g. traumas linked to intense emotions, deep fears, lack of love; 81% vs. 60% in AICT). The diversity score was also different among the two groups ( $M_{AICT} = 28.4$ ;  $M_{MT} = 16.2$ ). It is noteworthy that this score was very variable among the participants of a specific group (ranging from 5 to 44 in the AICT group and from 4 to 32 in the MT group).

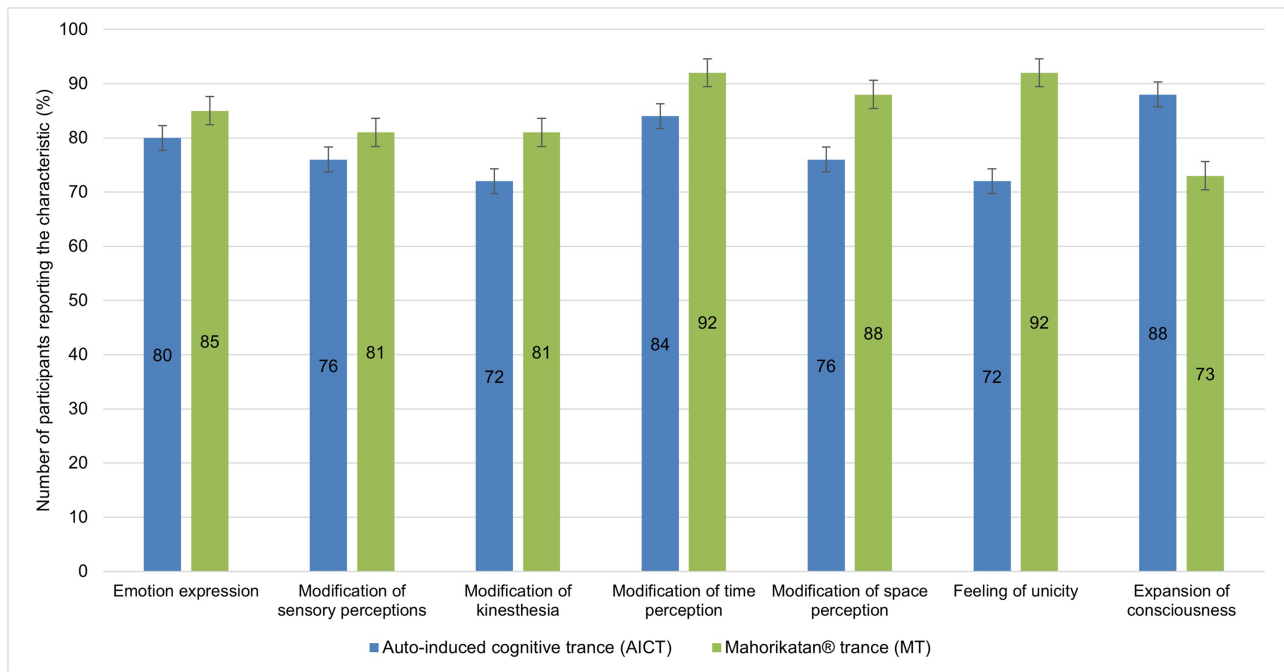
Figure 1 details the main phenomenological similarities (i.e. reported by  $\geq 70\%$  of the participants in each group) between AICT and MT.

Regarding the consequences of their trance practice, participants in both groups particularly underlined its effects on their social relationships (e.g. better relationships, increased openness, empathy, authenticity, harmony or respect; 74% of the total sample) and reported that this practice allowed them to learn something (90% of the total sample), such as techniques to feel calmer and less anxious, self-confidence, benevolence, self-knowledge, and living in the present moment. They also reported a feeling of being different than before starting their practice (92% of the total sample). For example, participants reported more precise perceptions, increased serenity, stability and openness/connection to other people and the world, regained sense of control over their life, or feeling of being complete. On the contrary, few participants reported consequences of their trance practice on their alimentation (73% of the total sample answered “no”) and on possible addictions (96% of the total sample answered “no”). In the AICT group, consequences of the trance practice on the professional life (e.g. professional reorientation, increased confidence at work, better relations with colleagues; 76%) and on the relationship with the environment (e.g. increased connection, respect, and attention, 76%) were also particularly reported, while consequences on the psyche (e.g. feelings of gratitude, harmony, inner peace; 81%) and the private life (e.g. better relationships, increased spirituality, and self-confidence; 77%) were slightly more reported by the MT participants.

## Discussion

Some NSCs are often referred to as “trance states”, including various practices characterized by a modulation of consciousness, but with their own specific characteristics, induction methods, and social roles. Most studies on these trance practices focused on traditional approaches and adopted an anthropological point of view, and very few investigated their phenomenological characteristics in a rigorous scientific way (Grégoire et al. 2021). The aim of this paper was to describe the phenomenological characteristics of two practices developed by experts who were trained in shamanic traditional communities: the AICT and the MT.

Our data suggested that these two groups were similar in terms of sociodemographic variables and history of experiences altering consciousness. Participants in the MT group, however, tended to be a bit older than those in the AICT group. Twenty-four percent of the AICT group and 15% of the MT group reported a past history of coma, which is much larger than the general population. Indeed, the incidence of coma is estimated to 8.4/100 000 in Europe (Giacino et al. 2018). The same observation applies to their past history of NDE (12% in the AICT group and 27% in the MT group), which is higher than the estimated prevalence of 4% to 8% reported in



**Figure 1.** Main phenomenological similarities between AICT and MT (percentage of respondents for each item + error bars)

different countries (Schmied et al. 1999, Knoblauch et al. 2001, Perera and Belanti 2005). One possible explanation for this result could be linked to the fact that people who reported an NDE frequently described it as a spiritual, religious, and/or supernatural experience (Aristidou et al. 2023, Hashemi et al. 2023) and tend to exhibit greater spirituality, openness (i.e. being original and coming up with new ideas), and fantasy (Bicego et al. 2023). Higher propensity to spiritual beliefs and practices and to dissociative states is also linked to a higher likelihood to report NDE (Rousseau et al. 2023). Traumatic brain injury has also been linked with a higher propensity to mystical experience, magical ideation, and religious experience (Cristofori et al. 2016, Zhong et al. 2018). It is then possible that people who report a history of traumatic brain injury and/or NDE are more interested in alternative and spiritual experiences, such as trance practice. Another explanation could also be that these concepts (i.e. coma; NDE) are often misunderstood and that some people may consider having lived these experiences when it was not the case. Almost half of the sample have had a regular practice since the end of the workshops, but MT participants have been practicing trance for a longer time than AICT ones. It is possible that this difference is due to the fact that MT has existed and been taught for longer than AICT (2013 for MT; 2019 for AICT). In both groups, duration of trance episodes was highly variable from one time to another. Regarding the self-induction technique, it evolved over time for most participants in the AICT group, which was not the case in the MT group.

Concerning the phenomenological characteristics of the two trance states, many similarities were highlighted. First, when considering the whole sample, the expression of different emotions during trance, modifications of the sensory perceptions, kinesthesia, time, and space perceptions, feelings of unicity and of a flow of energy, and an expansion of consciousness were reported by most participants. These results were expected. Indeed, modifications of sensory, time, and/or space perceptions have been reported in the first studies published on AICT (Vanhaudenhuyse et al. 0000, Flor-Henry et al. 2017, Gosseries et al. 2020, Martial et al. 2020) but

also in other studies on a type of shamanic trance based on the Harner's induction technique (Gingras et al. 2014, Hove et al. 2016, Huels et al. 2021) and in studies on mediumistic trance (Peres et al. 2012, Mainieri et al. 2017) and channeling (Wahbeh et al. 2019). The expression of strong emotions has also been reported in previous studies on AICT (Vanhaudenhuyse et al. under review, Flor-Henry et al. 2017, Gosseries et al. 2020) and in a study on shamanic trance (Huels et al. 2021). Finally, most participants from both groups reported some learning and a feeling of being different due to their practice of AICT or MT. It seems that this practice helped them to regain control over their life and to feel calmer, more serene, stable, self-confident, and benevolent. Participants also reported a deeper knowledge of themselves, a feeling of being complete, and an increased ability to live in the present moment. Finally, a higher sense of connection with the other people and the world in general was often reported. These results are in line with existing literature on different types of shamanic trances reporting a feeling of connection with the "visible and invisible worlds" as well as spiritual experiences (Winkelman 2012, Ivanescu and Berentzen 2020). Other similarities between AICT and MT concerned some features that were not reported by at least 70% of the total sample: amplified perception of past or current physical injuries, rapid eye movements, orgasm during trance, feeling of leaving one's body, feeling of being someone else, comeback of memories, telepathy, remote viewing, and production of an existing but not learned language. Recall of physical injuries or partial amnesia and the impact of trance on possible addictions were also the least reported consequences of trance practice in both groups.

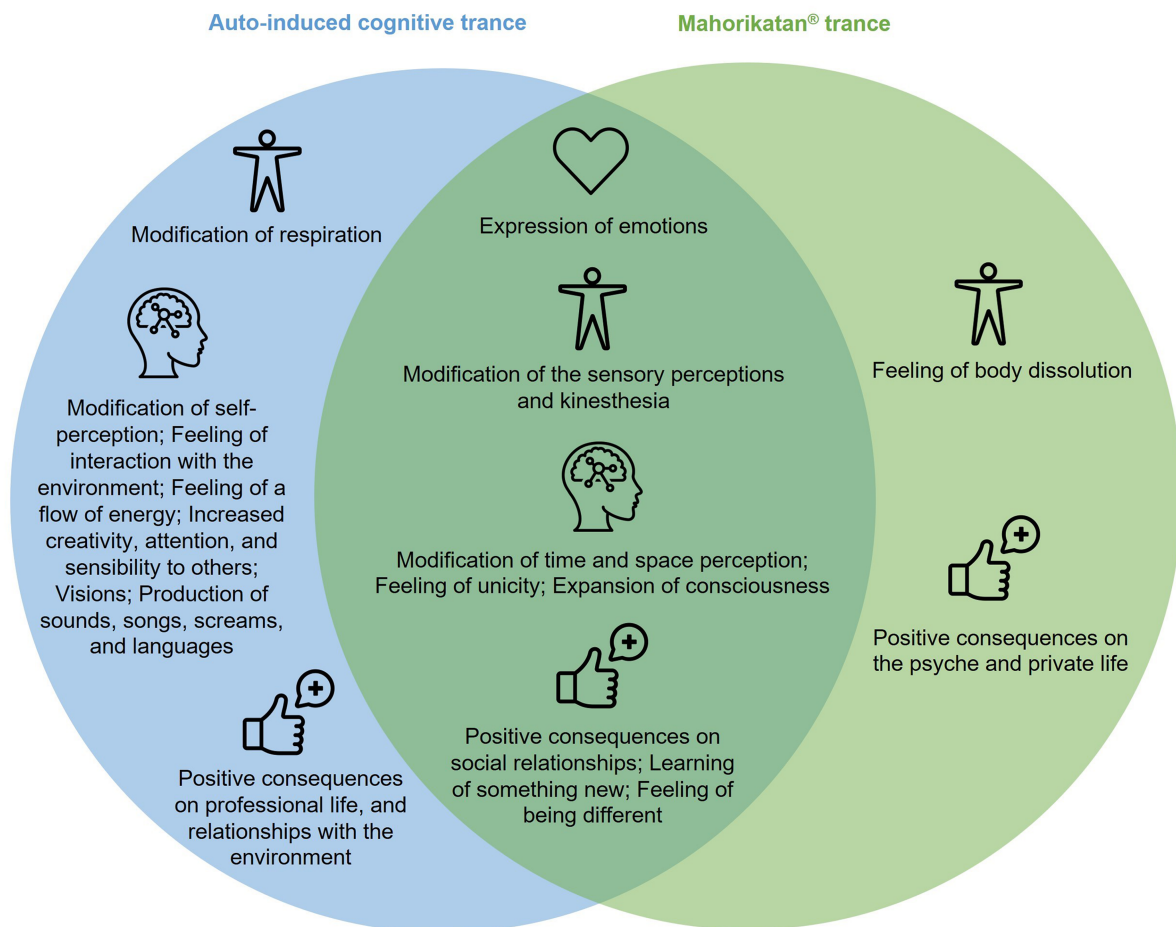
AICT was also characterized by several physical changes that tended to be less reported by participants from the MT group, such as the modification of physical strength, respiration and self-perception, a feeling of interaction with the environment, tingling, tremor, reflex movements, and rapid eye movements. At a cognitive level, AICT participants also reported more often modifications of self-perceptions, a feeling of interaction with the environment, as well as increased creativity, attention, and



sensibility to others, a dialogue with another human being or object, visions of entities and/or places, and the production of sounds, songs, languages, and screams for examples. These results are very probably related to the difference in the induction technique between these two trance states and to the suggestions and explanations provided by the team leader. Indeed, to induce AICT, participants are encouraged to use vocalizations and movements, and it was thus expected that the phenomenological characteristics of this state would include more frequent physical changes and production of diverse vocalizations. In comparison, MT involved slower moves and no vocalization. These results are also in line with first studies on one expert in AICT, showing that this state was characterized, among others, by the production of body movements and reflex movements (Flor-Henry et al. 2017, Gosseries et al. 2020) and in a case by a feeling of increased muscular strength and a modification of self-perceptions (Flor-Henry et al. 2017). Other works on other shamanic trances also underlined the high frequency of these features (Walker 2003, Vuckovic et al. 2010, Keeney and Keeney 2018). Only one characteristic appeared to be more reported among the participants from the MT group: the feeling of body dissolution. Body dissolution can be understood as the impression that the body is melting, or that the person disappears, or becomes “nothing” or “everything”. This result suggests that it could be an important component of MT. The fact that many features were more reported in the AICT group compared to the MT group is in line with the difference in the

diversity score between both, suggesting a higher diversity regarding AICT. However, the range of the diversity score also underlined a high variability of the experience in the sample. This suggests that, in a specific group, some participants will report very few features to qualify their trance experience, while other will report a lot of them. One possible explanation for the higher number of features reported in the AICT group and the absence of characteristic possibly specific to MT (except for body dissolution) is linked to the questionnaire used. Indeed, it was firstly designed to explore the subjective experience during AICT. In this study, this questionnaire was also proposed to MT practitioners, in order to allow for a first comparison of the phenomenological characteristics of both states. It is then possible that it was not adapted to capture the specificities of MT. However, these suggested that some phenomenological characteristics differ between the two states, such as physical changes and vocalizations that are more reported during AICT, while others are similar, such as the expression of emotions and the modifications of different perceptions. They also underlined the high variability in the diversity of the trance experience reported by the practitioners. Figure 2 summarizes the main characteristics and consequences of each trance state (i.e. reported by  $\geq 70\%$  of the participants) and underlines those common to both states.

This study suffers from several limitations. First, this study is retrospective, as the participants had to answer to the questionnaires considering their trance practice as a whole and not



**Figure 2.** Main characteristics and consequences (i.e. reported by  $\geq 70\%$  of the participants) of AICT and MT

a specific recent trance episode. This could have influenced their answers. Then, the main questionnaire used has been designed based on the subjective reports of several trance (mainly AICT) practitioners. Thus, it is not a standardized tool. It is possible that different characteristics of the trance states were not assessed by this questionnaire, especially characteristics that would have been relevant for the MT practitioners. Different items about emotional (e.g. feeling of emotional harmonization, feeling of inner peace, and feeling of being “back home”), physical (e.g. feeling of air densification, feeling of rediscovering the body, and increased vitality), and cognitive (e.g. feeling of a more global apprehension of reality and feeling of forgetting the environment) characteristics of the trance state could then be added to the questionnaire. The mean duration of the trance episodes could also have been assessed more precisely. The diversity score is also based on the number of questions answered by “yes” and thus does not allow to capture the participants’ diverse and complex subjective experiences. In addition, the range of the diversity score in each group also showed that some participants reported very few items and that other reported a lot of features, in both groups. This suggests that, in both groups, some participants had a very rich phenomenological experience of trance, while others did not. Other factors than the trance state itself or its induction methods could then be involved in the subjective experience of trance states, such as the frequency and duration of practice, suggestibility, relationship with the group leader, or personality traits for example. Some methodological limitations also include the absence of randomization between the two groups, the way the participants were recruited (i.e. directly during the workshops, without a priori sample size calculation leading to the creation of a convenience sample), and the differences between both groups at baseline (i.e. age, religious/spiritual practice). In addition, the questionnaire addresses some little-known concepts (e.g. coma and NDE) linked to different beliefs that could have influenced the answers of the participants. As discussed earlier, this could be one explanation for the high rate of participants reporting a history of coma and/or NDE. They were also given to some participants directly by the workshop’s leader and not by the experimenters involved in this study. The conditions in which the questionnaires were completed were thus not standardized. Interviews with the participants could have been interesting to discuss in more detail their trance practice and experiences, especially given the small number of participants in this study. We also chose the arbitrary threshold of 70% of respondents for each item of the questionnaire to describe the main components of each trance state, which of course influenced our results. Finally, the two groups were conducted by two different leaders, each of them having their own expertise (AICT or MT). As said earlier, the way they introduced the participants to their respective induction technique could have influenced the way the participants felt during trance and how they characterized this state.

However, this study allowed to better characterize two trance states (i.e. AICT and MT) and to make a first comparison of their respective phenomenological characteristics. This is particularly important as it is still unknown whether different induction techniques would induce a same trance state or whether these states would be different. Our results suggested that the two induction techniques (i.e. AICT and MT) lead to two trance states with many similarities and pointed out some possible differences between them. They are in line with another study showing that the cognitive characteristics (e.g. internal dialogue and visual imagery) of a trance state differed according to the induction text used

(i.e. “modern trance language” characterized by indirect suggestions and narrative style with metaphors vs. “traditional trance language” found in traditional communities and characterized by multiples repetitions and narrative sequences, without suggestions), while emotional (i.e. positive and negative affects) and physical (i.e. arousal) experiences were similar (Karrasch et al. 2022). Our study opens different scientific perspectives. First, the main questionnaire could be improved by adding different questions based on other phenomenological characteristics, with the help of experts in other trance states. This would allow to further explore the differences between AICT and MT, in a larger-scale study. Second, characterizing more precisely the profiles of people interested in trance practices could also be of interest. Finally, comparing the phenomenological characteristics of AICT and/or MT with other trance practices could also allow a better understanding of each trance state. At a clinical level, we know that NSCs are increasingly used to improve patients’ well-being (e.g. hypnosis (Grégoire et al. 2017, Bicego et al. 2022, Langlois et al. 2022, Franch et al. 2023) and meditation (Gu et al. 2018, 2022, Johns et al. 2021)). Trance states inherited from shamanic practices also showed some benefits on physical and psychological health (Krycka 2000, Vuckovic et al. 2010, 2012, Wahbeh et al. 2017), and the clinical benefits of AICT are currently being investigated to improve quality of life in oncology (Grégoire et al. 2022). The present results seem to be in line with these works, as they underlined a feeling of unicity, an increase of emotion expression, and a modification of sensory perceptions during both trance states, suggesting their potential interest to improve well-being. In addition, the action of AICT on painful or sick parts of the body was also frequently reported. Thus, exploring the impact of AICT, MT, or other trance states on the quality of life of different clinical or non-clinical populations represents a promising perspective. Finally, in addition to the growing interest in the “westernization” of shamanic practice, also called “neo-shamanism”, we can note an increasing interest from people in complementary approaches, especially mind-body ones, to manage their difficulties on their own and to regain power over their life. This suggests that interventions based on such techniques could be easily implemented and accepted.

## Acknowledgements

We want to thank Antoine Pelle, Jitka Annen, Charlotte Martial, and the volunteers who participated in this study.

## Author contributions

C.G. performed the data analysis and drafted the manuscript. O.G. and A.V. conceptualized the study and funded the research. O.G., A.V., P.L., and A.G. acquired the data. C.S. and P.L. led the trance training groups. M.W. developed the diversity score of the main questionnaire. All authors revised the manuscript critically for important intellectual content, approved it in its final form, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

## Conflict of interest

C.S. is the founder of the TranceScience Research Institute (Paris, France) and developed the AICT technique. P.L. is the founder of The Call of Souls Project Foundation (Plainevaux, Belgium) and developed the MT dance. The other authors declare no conflict of interest related to this work.

## Funding

The study was supported by the University and University Hospital of Liege and its Algology Interdisciplinary Center, the Belgian National Funds for Scientific Research (FRS-FNRS & FRS-FNRS Télévie), the MIS FNRS (F.4521.23), the BIAL Foundation, the Mind Science Foundation, the fund Generet, the King Baudouin Foundation, the AstraZeneca foundation, the Leon Fredericq foundation, the Belgium Foundation Against Cancer (Grants Number: 2017064 and C/2020/1357), and the Benoit Foundation. C.G. is a postdoctoral researcher at FRS-FNRS, and O.G. is a research associate at FRS-FNRS.

## Data availability

The complete dataset is available upon reasonable request (avanhauzenhuysen@chuliege.be; ogosseries@uliege.be).

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