

RESEARCH ARTICLE

Examining the short-term anxiolytic and antidepressant effect of Floatation-REST

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Abstract

Floatation-REST (Reduced Environmental Stimulation Therapy) reduces sensory input to the nervous system through the act of floating supine in a pool of water saturated with Epsom salt. The float experience is calibrated so that sensory signals from visual, auditory, olfactory, gustatory, thermal, tactile, vestibular, gravitational and proprioceptive channels are minimized, as is most movement and speech. This open-label study aimed to examine whether Floatation-REST would attenuate symptoms of anxiety, stress, and depression in a clinical sample. Fifty participants were recruited across a spectrum of anxiety and stress-related disorders (posttraumatic stress, generalized anxiety, panic, agoraphobia, and social anxiety), most ($n = 46$) with comorbid unipolar depression. Measures of self-reported affect were collected immediately before and after a 1-hour float session, with the primary outcome measure being the pre- to post-float change score on the Spielberger State Anxiety Inventory. Irrespective of diagnosis, Floatation-REST substantially reduced state anxiety (estimated Cohen's $d > 2$). Moreover, participants reported significant reductions in stress, muscle tension, pain, depression and negative affect, accompanied by a significant improvement in mood characterized by increases in serenity, relaxation, happiness and overall well-being ($p < .0001$ for all variables). In reference to a group of 30 non-anxious participants, the effects were found to be more robust in the anxious sample and approaching non-anxious levels during the post-float period. Further analysis revealed that the most severely anxious participants reported the largest effects. Overall, the procedure was well-tolerated, with no major safety concerns stemming from this single session. The findings from this initial study need to be replicated in larger controlled trials, but suggest that Floatation-REST may be a promising technique for transiently reducing the suffering in those with anxiety and depression.

Trial registration: ClinicalTrials.gov [NCT03051074](https://clinicaltrials.gov/ct2/show/study/NCT03051074)

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Introduction

The history of Floatation-REST dates back to the 1950's when Drs. Jay Shurley and John Lilly at the National Institute of Mental Health became interested in understanding how the human

brain would respond to an environment devoid of external sensory input. It was discovered that rather than falling into a deep sleep or losing consciousness, participants maintained full awareness [1, 2]. Initial designs employed various masks intended to shield the brain from sensory input [1], whereas the first fully immersive floatation tank wasn't built until 1957, when Dr. Shurley constructed his laboratory at the Oklahoma City Veterans Administration hospital [2]. In this first iteration of Floatation-REST, the participant was immersed vertically in a tank of water with an opaque helmet surrounding their head connected to a series of breathing tubes for ventilation. Due to the confined nature of the helmet, very few individuals participated in these early experiments outside of NASA astronauts in training for the mission to the moon [3, 4].

In the 1970's, Glenn Perry (in collaboration with John Lilly) invented a horizontal version of the float tank that removed the need to wear a helmet [5]. This newer iteration has individuals lay supine in a shallow pool of water saturated with a high concentration of Epsom salt, allowing individuals to effortlessly float on their back, with the eyes, nose, and mouth comfortably hovering above the water surface. While this change in design exposed floating to a much wider audience, many still found the tanks too confining and claustrophobic in nature. Consequently, floating went through a long period of dormancy up until this past decade, where the practice has witnessed a rapid rise in popularity, likely bolstered by the creation of more spacious tanks and pools. Hundreds of commercial "float centers" have started to open across North America and Europe, where individuals will pay money to float, with sessions typically ranging between 45–90 minutes in duration.

Despite this recent surge in float centers, there has been very little research investigating Floatation-REST. The majority of past floatation research occurred in the 1980's and 1990's, primarily in small samples of healthy participants. The most consistent observation to date has been significant reductions in levels of subjective stress and increases in relaxation as measured from pre- to post-float [6–12]. Concomitant with these subjective findings, floating has also been reported to decrease blood pressure [12–17], heart rate [11, 13], as well as plasma cortisol [17–19]; but see [20]. A meta-analysis of 27 Floatation-REST studies found a large overall effect size for stress reduction [21], with most studies focused exclusively on healthy populations.

Clinical research investigating Floatation-REST, although limited, has reported largely beneficial effects across a range of different stress-related conditions, including: hypertension [14, 16], chronic tension headaches [22, 23], chronic muscle tension pain in the back and neck [24], and stress-related pain with "burnout depression" [7, 25]. Thus far there have only been two published Floatation-REST studies focused on individuals with anxiety [23, 26], both in participants with self-reported symptoms of "generalized anxiety." These studies examined the long-term effects of repeated float sessions, but did not assess the short-term effects arising from a single float session. The first study [23] was an uncontrolled investigation at a hospital that collected retrospective surveys in patients who utilized their Floatation-REST facility as part of a stress management program. They found that after ~7 float sessions, patients with generalized anxiety reported improvement in symptoms when assessed an average of 7 months later. The second study [26], a pilot trial in 50 participants randomized to either a waitlist control group or 12 sessions of Floatation-REST, observed a significant reduction in symptoms of generalized anxiety in the float group that was maintained at 6-month follow-up. No studies to date have examined the effects of Floatation-REST in posttraumatic stress disorder (PTSD), panic disorder, agoraphobia, social anxiety disorder, or major depressive disorder, and with the exception of a few individual case studies [27, 28], there has been no other research investigating the impact of Floatation-REST in patients with clinically diagnosed anxiety, depression, or any other mental health disorder.

Anxiety and depression are the two most common mental health disorders, with the proportion of people who will develop a disorder at some point in life (i.e., lifetime morbid risk)

estimated to be 42% for anxiety disorders and 30% for major depression [29]. While viewed as separate conditions, comorbidity is often the rule rather than exception, with well over 50% of cases displaying a mix of both anxiety and depression [30, 31]. The cost and toll to society is tremendous, with depression now considered to be the leading cause of worldwide disability [32, 33], and anxiety the sixth leading cause of worldwide disability [34]. The age of onset is typically in adolescence and young adulthood, with symptoms often persisting throughout life without treatment [29, 35, 36]. Pharmacotherapy (e.g., selective serotonin reuptake inhibitor) and psychotherapy (e.g., cognitive behavioral therapy) are the two most commonly prescribed treatments for both anxiety and depression [37, 38]. Recent meta-analyses and large-scale clinical trials suggest that approximately 50% of patients improve with treatment [39, 40], with substantially poorer outcomes and adherence in patients with comorbid anxiety and depression [41, 42]. Given the insufficient treatment response and adherence to currently available therapies, it is important to explore novel ways of helping patients with anxiety and depression.

While the extant research (reviewed above) suggests that Floatation-REST may be a useful technique for stress reduction, there has been essentially no research exploring whether its stress-reducing properties can be effectively applied to individuals with clinically-diagnosed anxiety and depression. Consequently, this study took a transdiagnostic approach by recruiting a heterogeneous sample spanning the spectrum of different anxiety and stress-related disorders including PTSD, Generalized Anxiety Disorder, Panic Disorder, Agoraphobia, and Social Anxiety Disorder, as well as comorbid unipolar Major Depression. Since this was the first Floatation-REST study to examine these different clinical disorders, close attention was paid to issues of safety and tolerability. We were also interested in characterizing the range of different emotional and subjective changes that might arise in this environment, to detect whether any clinically meaningful changes were being induced. We hypothesized that a single session of Floatation-REST would lead to an acute reduction in symptoms of anxiety and depression irrespective of diagnosis.

Methods

Ethics statement

All study procedures were approved by the Western Institutional Review Board (WIRB), and all participants provided written informed consent prior to participation. During the consent process, all participants were queried about their understanding of the protocol to ensure they had the capacity to consent and understood that testing was completely voluntarily and could be stopped at any time. The trial was registered on ClinicalTrials.gov (<https://clinicaltrials.gov/show/NCT03051074>), and this open-label study represents the first float session in the registered trial. Since there were multiple sessions in the registered trial, subsequent revisions have been made to the protocol, but all details for this open-label study were submitted within 21 days of enrollment of the first participant. The protocol for this trial, supporting TREND checklist, and raw data are available as supporting information; see [S1 Protocol](#), [S1 Checklist](#), and [S1 Data](#).

Participant recruitment

Participants for this study were recruited through the Tulsa 1000 (T1000) database maintained at the Laureate Institute for Brain Research (LIBR). The T1000 is a naturalistic study that aims to recruit and longitudinally follow 1000 treatment-seeking individuals from the local community, many of whom have anxiety and/or depression. T1000 subjects were recruited from mental health providers or through general advertisements, and were excluded if diagnosed with

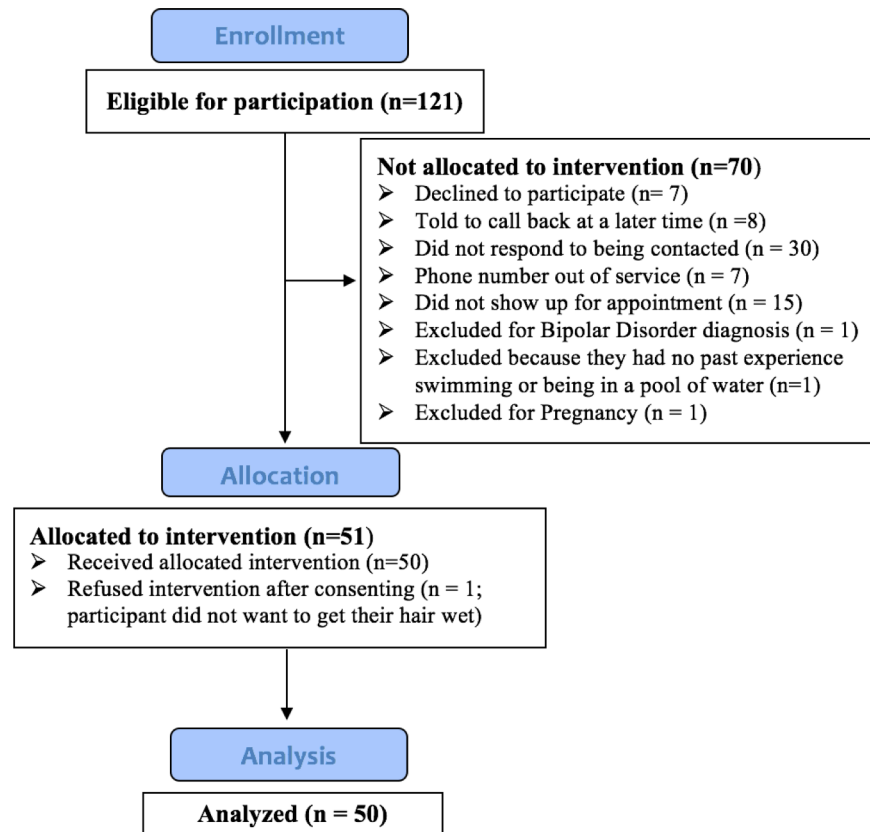


Fig 1. Flow diagram for study recruitment.

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any of the following disorders: Schizophrenia Spectrum and Other Psychotic Disorders, Bipolar and Related Disorders, Obsessive-Compulsive and Related Disorders. Each participant received the Mini-International Neuropsychiatric Interview (MINI) version 6.0 [43], a validated, structured, diagnostic interview with questions that parallel symptoms in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)[44]. The MINI was administered by interviewers trained in the assessment of anxiety and depression, and all psychiatric diagnoses were confirmed via an extensive review of the clinical history by a board-certified psychiatrist. Based on our inclusion and exclusion criteria (see below), 121 participants from the T1000 were eligible at the time of study recruitment (Fig 1).

Inclusion and exclusion criteria. The specific inclusion and exclusion criteria (Table 1) for recruiting participants from the T1000 database were selected based on several considerations. First, since our hypothesis was focused on testing the reduction of self-reported anxiety and depression, we targeted participants across the spectrum of different anxiety and stress-related disorders, many with comorbid unipolar depression. Second, since we were recruiting from a convenience sample assessed at variable intervals in relationship to the onset of this study, we aimed to maximize our chances of selecting individuals who would still present with high levels of anxiety on the day of Floatation-REST. To accomplish this goal, we focused on recruiting participants with very high levels of anxiety sensitivity defined as an Anxiety Sensitivity Index (ASI-3) total score ≥ 30 . Anxiety sensitivity refers to an individual's fear of experiencing anxiety-related symptoms and is a core construct underlying the initiation and maintenance of pathological anxiety [45]. Importantly, individuals with high levels of anxiety

Table 1. Inclusion and exclusion criteria.

Inclusion criteria	Exclusion Criteria
1. DSM-IV diagnosis on the MINI of an Anxiety Disorder (Generalized Anxiety Disorder, Social Anxiety Disorder, Panic Disorder, Agoraphobia) and/or Posttraumatic Stress Disorder (PTSD)	1. Comorbid Bipolar Disorder or Schizophrenia
2. Overall Anxiety Severity and Impairment Scale (OASIS) score \geq 8	2. Active suicidality with intent or plan
3. Anxiety Sensitivity Index (ASI-3) total score \geq 30	3. Currently receiving inpatient treatment
4. If taking medication, must be stably medicated prior to participation (defined as having taken the medication for 6 weeks or longer)	4. Current Substance Use Disorder \geq moderate
5. Between 18–55 years of age	5. History of neurological conditions (e.g., epilepsy, stroke, severe traumatic brain injury, Parkinson’s disease, Alzheimer’s disease or other forms of dementia)
6. No prior Floatation-REST experience	6. Any skin conditions or open wounds that could cause pain when exposed to saltwater
	7. Inability to swim or lay comfortably in a shallow pool of water

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sensitivity have a propensity for greater chronicity of illness and a higher likelihood of experiencing future anxiety symptoms [46–48]. We also included a cutoff score of 8 or greater on the Overall Anxiety Severity and Impairment Scale (OASIS), which has been shown to correctly classify 87% of individuals as having a current anxiety disorder diagnosis [49]. Both the ASI-3 and OASIS were re-administered the day of Floatation-REST, and the updated scores are presented in Table 2. Third, since the T1000 is a naturalistic study based on a community sample, we allowed participants who were stably medicated into the study. However, we added exclusion criteria for more severe forms of psychopathology and substance use in order to minimize potential safety risks. And lastly, in order to mitigate effects related to differential expectations and experience, we recruited participants who had never tried Floatation-REST before, but had at least some life experience either swimming or being in a pool of water.

Reference sample of non-anxious participants. As a point of reference for the float-related findings in anxious individuals, we provide results collected in a sample of 30 healthy non-anxious individuals who were tested in a separate study that involved functional neuroimaging. These individuals were screened to be free of any current or past psychiatric illness (as determined by the MINI) and were not taking any drugs or medications. Although there were

Table 2. Participant demographics and baseline functioning on the day of Floatation-REST.

	Anxious Group	Severely Anxious Subgroup	Healthy Reference Sample
Number of subjects	50	17	30
Sex (male/female)	16/34	5/12	12/18
Age (years)	36.8 (10.9)	32.3 (11.2)	32.5 (10.4)
Education (years)	14.1 (2.2)	14.0 (2.1)	14.4 (2.0)
BMI (kg/m ²)	29.3 (5.2)	29.6 (5.7)	26.3 (5.8)
Anxiety sensitivity (ASI-3)	26.6 (14.8)	43.0 (9.0)	7.9 (7.0)
Anxiety severity (OASIS)	9.6 (4.2)	12.8 (3.3)	*
Depression severity (PHQ-9)	11.4 (6.0)	16.3 (4.1)	*
Level of disability (SDS)	13.5 (7.8)	20.2 (5.7)	*
Level of stress (PSS)	25.7 (5.9)	29.8 (5.5)	*
Average life happiness (HM)	4.4 (2.3)	3.2 (2.4)	7.7 (0.5)
Net-time happiness (HM)	-7.3 (31.2)	-30.0 (26.2)	58.9 (18.8)

Numbers in parentheses represent the standard deviation. ASI-3: Anxiety Sensitivity Index total score; OASIS: Overall Anxiety Severity and Impairment Scale; PHQ-9: Patient Health Questionnaire; PSS: Perceived Stress Scale; SDS: Sheehan Disability Scale; HM: Happiness Measure. The severely anxious subgroup is a subset of the participants in the anxious group who had an ASI-3 total score \geq 30 and an OASIS score \geq 8 on the day of Floatation-REST.

*Not collected in the Healthy Reference Sample.

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several aspects to this other study that differed from the present study (which we describe below), there were also a number of similarities: (1) all 30 non-anxious participants had no prior Floatation-REST experience, (2) the data we show is derived from their first float session, which took place in the same open float pool, and (3) we collected many of the same self-report measures both before and after their float session. There were no brain scans the day of their first float session, and the experimental procedures were largely identical to the present study with the following exceptions: (a) float sessions were 90 minutes in length and participants were encouraged to float for the entire 90 minutes (whereas the anxious participants were instructed that they could float for “up to 60 minutes” and could end the float at any time), and (b) participants were encouraged to keep the lights off for the duration of their float session (whereas the anxious participants were given the choice to keep the lights on or off). Due to these differences, we did not perform any statistical comparisons between the anxious and non-anxious samples. Therefore, the results from this group of non-anxious participants are presented in this paper merely as a point of reference to provide context for the findings observed in the anxious sample.

Measures

All self-report measurements were administered electronically to participants via an Apple iPad using REDCap (Research Electronic Data Capture), a secure web-based application for the electronic collection and management of research and clinical trial data (www.project-redcap.org). REDCap servers are housed in a local secure data center at LIBR with all web-based transmission encrypted and all participant data de-identified using a unique identifier code to ensure patient confidentiality. Three different types of self-report measures were administered: baseline measures, pre/post-float measures, and follow-up questions. The baseline measures were focused on assessing current symptomatology and overall mood and level of functioning during the time period of the Floatation-REST study. The pre/post-float measures were collected at two time points, approximately 30 minutes before and after each float session, in order to assess for fluctuations in state affect and mood. At each time point, participants rated how they felt “right now, in the present moment”. Along these lines, when completing the post-float measures, participants were explicitly instructed not to retrospectively rate how they felt during the float itself. In contrast, the follow-up questions were primarily aimed at gathering additional information about each participant’s actual float experience, including an assessment of potential adverse events.

Baseline measures. Anxiety Sensitivity Index (ASI-3): The ASI-3 is an 18-item questionnaire that has been shown to have good reliability and validity, and improved psychometric properties over the original measures [48]. Questions are answered using a 4-point scale and total ASI scores can range from 0 to 72. Normative data collected in a large sample ($n = 4,720$) of healthy North Americans indicate a mean ASI-3 total score of 12.8 ($SD = 10.6$) [48]. A meta-analysis [46] found that patient groups with anxiety and depression commonly have a total ASI score above 30, and other studies have used a cutoff score ≥ 30 to recruit individuals with very high levels of anxiety sensitivity [50, 51].

Overall Anxiety Severity and Impairment Scale (OASIS): The OASIS is a 5-item questionnaire that can be used across the different anxiety disorders as a continuous measure of anxiety severity and impairment over the past week [52]. Each item is rated on a 5-point scale and the ratings are summed to obtain a total score ranging from 0 to 20. A cut-score of 8 has been shown to correctly classify 87% of individuals as having a current anxiety diagnosis [49].

Patient Health Questionnaire (PHQ-9): The PHQ-9 is a 9-item measure for assessing the severity of depressive symptoms over the past 2 weeks [53]. Scores of 1–4 are considered

indicative of minimal depression, 5–9 mild depression, 10–14 moderate depression, 15–19 moderately severe depression, and 20–27 severe depression.

Perceived Stress Scale (PSS): The PSS is a 10-item questionnaire used for measuring an individual's perception of stress in their life over the past month [54, 55]. The PSS has good psychometric properties [56], with mean normative scores in healthy populations around 13 (SD = 6) [55].

Sheehan Disability Scale (SDS): The SDS assesses how much the respondent's mental health issues are perceived to have affected their daily activities in three functional domains: work/school, social/leisure activities, and family life/home responsibilities [57]. Total disability scores range between 0 to 30, with scores ≥ 5 signifying impairment [58]. A review of studies using this measure indicated significant impairment in functioning in patients with anxiety disorders, who have mean total disability scores typically ranging between 14–18 [59].

Happiness Measure (HM): The HM is a short trait measure of emotional well-being [60] comprised of 4 questions assessing how happy or unhappy an individual generally feels. The first question asks the person to choose a statement that best describes their average happiness on a scale from 0 (Extremely unhappy) to 10 (Extremely happy). The remaining questions ask the individual to rate the average percentage of time they feel *happy*, *unhappy*, and *neutral* with percentages totaling to 100%. A net-time happiness score is calculated by subtracting the % time unhappy from the % time happy. The HM has been reviewed in relation to other well-being measurements and has been shown to be a quick and efficient measure with good reliability and discriminative validity [60].

Pre/Post-float measures. Primary outcome measure—State-Trait Anxiety Inventory (STAI-Y State form): The Spielberger State Anxiety Inventory is a widely used 20-item self-report questionnaire designed to assess an individual's level of anxiety at the present moment with total scores ranging from 20–80 [61]. The items assess for the presence or absence of current anxiety symptoms, and the measure has been shown to have excellent internal consistency and good convergent and discriminant validity [61]. Many other clinical trials have used this measure, including pharmacological (e.g., [62, 63]) and non-pharmacological (e.g., [64, 65]) interventions for anxiety.

Positive and Negative Affect Schedule—Expanded Form (PANAS-X): The PANAS is one of the most commonly used measures of mood, comprised of two 10-item scales used to extract measures of positive and negative affect [66]. 13 additional items were added from the PANAS-X [67] to compute the specific affect scales of Serenity, Joviality (referred to here as "Happiness"), and Fatigue. The PANAS-X has high internal consistency, and good convergent, discriminant, and construct validity [66, 67]. Participants completed this version of the PANAS-X using the "at the present moment" instructions.

Karolinska Sleepiness Scale (KSS): The KSS is a single item measure of present moment sleepiness that has been validated against relevant behavioral and electroencephalography measures [68, 69].

Wong-Baker Pain scale: This commonly used pain measure has participants rate their current level of pain from 0 to 10 using drawings of faces that range from smiling to crying [70].

Visual Analogue Scales (VAS): Each VAS measure contained a digital slider that participants could move along a horizontal line. Seven VAS measures contained a slider that started on the far left and had participants rate how they currently felt on a 100-point scale that went from "Not at all/None" (far left) to "Extremely/The most I have ever felt" (far right). These VAS measures were used to capture potential changes with regard to subjective: Relaxation (How relaxed do you feel right now?), Muscle tension (How much muscle tension or tightness do you feel right now?), Stress (How stressed or anxious do you feel right now?), Depression (How sad, down, or depressed do you feel right now?), Content/Peaceful (How content or

peaceful do you feel right now?), Refreshed (How refreshed do you feel right now?), and Energy (How much energy do you have right now?).

In addition, we also included a modified VAS that assesses Overall Well-Being using a bipolar valence scale that goes from “Pretty Bad” (far left) to “Pretty Good” (far right), with the slider starting in the middle at “Neutral” and asking, “In general, over the past hour, how have you felt?”

Follow-up questions. After completing the post-float measures, participants answered some additional follow-up questions. One question asked, “At the end of your float, how did you feel about the duration?” and contained three answer choices: (1) I wanted to get out before my time was up, (2) It was the perfect amount of time, (3) I wish I could have stayed in longer. Another question asked, “What other techniques have you tried to help you relax and feel less anxious and stressed?” Participants were provided with 12 different options and were instructed to check all techniques that they have tried at least once: anti-anxiety medication, psychotherapy/counseling, massage, exercise, alcohol, breathing techniques, cigarettes, marijuana, progressive muscle relaxation, meditation, yoga, and other. The next question asked, “How did the relaxation you experienced during and after today’s float session compare to the other relaxation techniques you have tried?” and contained three answer choices: (1) I experienced more relaxation with other techniques, (2) Floating was equally as good as the other techniques I have tried, (3) I experienced more relaxation with floating than any other technique I have tried. Two final questions asked, “Would you be interested in floating again sometime in the future?” and “Do you think floating in these specialized pools has the potential to be an effective therapy for reducing stress and anxiety and improving people’s mood?”, with each question containing three answer choices: Yes, No, Maybe.

Side effect checklist. After completing the follow-up questions, participants completed a 43-item side effect checklist that was created for this study in order to assess the safety of Floatation-REST in this clinical population, and probe for the presence of potential adverse experiences. The instructions asked, “Did you notice or experience an **increase** in any of these items during or shortly after your float today? Please only mark items that showed an increase from your typical day-to-day experience.” For each item, participants had to select one of four choices (None, Mild, Moderate, or Extreme) and for any response other than “None” a free-response box allowed them to describe their experience in more detail. Two-thirds of the items described a range of different negative experiences, many probing various psychiatric symptoms including panic, dissociation, flashbacks, suicidality, mania, psychosis, and negative thought content. In order to not bias the participant, the other one-third of items described a range of different positive experiences, including items probing for the presence of peak life experiences.

Debriefing interview. In order to further assess for the occurrence of adverse events, as well as gather more qualitative information about the float experience, each participant completed a short debriefing interview with the experimenter at the end of each visit using a series of open-ended questions: Overall, how was your float today? What did you think about, if anything, while you were floating? Did anything surprise you during the float or happen unexpectedly? Did you learn anything about yourself during this experience? All responses were recorded with a digital audio recorder and later transcribed (see [S1 Debriefing interview transcriptions](#)).

Floatation-REST intervention

The Float Clinic & Research Center at the Laureate Institute for Brain Research contains an open float pool ([Fig 2](#)) that was custom-designed for research purposes by Floataway (Norfolk,



Fig 2. Floatation-REST in an open circular float pool. The circular fiberglass pool is 8 feet in diameter and contains 11 inches of reverse osmosis water saturated with ~1,800 pounds of USP grade Epsom salt (magnesium sulfate), creating a dense salt water solution that is maintained at a specific gravity of ~1.26, allowing participants to effortlessly float on their back while the water hovers just above the ears. A small blue LED light remains illuminated throughout the float session, and can be turned off by the participant through a round air switch (both of which can be seen in the picture, located immediately adjacent to the participant's right foot). Unlike the picture, clothing is usually not worn while floating since anything touching the body can generate somatosensory stimulation, potentially detracting from the float experience.

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United Kingdom). The open float pool was designed to help reduce the barriers to entry for anxious populations, including: (1) elimination of the enclosure commonly found on most float tanks in order to reduce feelings of claustrophobia, (2) use of a high-powered disinfection system for sterilization of the water, and (3) providing the participant with complete control over the experience so that they can freely enter and exit the pool at any time, as well as have the lights on or off at their choosing.

Since the open pool has no enclosure, the room around the pool was constructed to be waterproof, soundproof, lightproof, and temperature-controlled in order to provide a similar experience to fully-enclosed float tanks. Silent heaters were placed under the pool to maintain the water at a constant temperature and a dedicated heating, ventilation, and air conditioning system maintains the air at a constant temperature. The temperature of the water and air was calibrated to approximate the surface temperature of the skin (~95.0 °F), and could be adjusted remotely by the experimenter in a nearby control room. An intercom system allowed the participant to freely communicate with the experimenter throughout the float session should any issues arise, and specialized speakers placed around the perimeter of the pool allowed the experimenter to communicate with the participant and play music. There are no cameras inside the float room and the outside door was locked to ensure complete privacy throughout the float session.

While floating, a blue LED light remains illuminated in the background and could be turned off by the participant using an air switch. Once triggered, the air switch activates an infrared wave detection system so that participants can remain floating and still turn the blue light on and off simply by waving their arm in the air. In addition, a small sensor placed slightly above the water line discerns when the float pool is occupied. Both the occupy sensor and wave detection system are linked to digital clocks in the control room, allowing for the automated calculation of the total amount of time that a participant is floating and the total amount of time that a participant is floating with the lights off.

The float experience is calibrated so that sensory signals from visual, auditory, olfactory, gustatory, thermal, tactile, vestibular, gravitational and proprioceptive channels are minimized, as is most movement and speech. Visual stimulation is minimized by having an entry door and gasket system which expunges all sources of outside light. In addition, there are no

windows inside the float room, and the adjacent room contains a private bathroom that also has no windows, and no lights (which are automatically shut off during the float itself). Thus, when the entry door to the float room is sealed and the blue LED light inside the pool is turned off, the float room is completely dark. Auditory stimulation is minimized by constructing the float room using multiple layers of sound dampening walls with thick insulation and added soundproofing material, restricting most outside airborne sound from entering the room. Structural sounds transmitted via vibrations in the floor are absorbed by having the pool rest on a bed of 48 butyl rubber springs, effectively isolating the pool from the building and preventing all structure-borne noises from entering the water. Olfactory stimulation is minimized by only using unscented cleaning products and having the participant shower beforehand to help remove body odors. In addition, the water disinfection system (described in more detail below) does not emit any odors during the oxidative process. Gustatory stimulation is minimized by having participants eat several hours before the float, while refraining from eating and drinking during the float. Thermal stimulation is minimized by setting the temperature of the water and the air to closely match the temperature at the surface of the skin, which is typically a few degrees cooler than core body temperature. All temperature sensors were calibrated using a Thermoworks precision thermometer (Utah, USA) certified by the National Institute of Standards and Technology (NIST). Throughout each float session, the water temperature was maintained at 95.0 °F (± 0.3 °F) and the air temperature at the rim of the pool was maintained at 93.5 °F (± 0.5 °F), slightly lower than the water temperature based on the relative humidity in the air. This temperature setting helps minimize the need for thermoregulation while reducing the perceptual boundary between air, body, and water, a unique feature of the float experience. Specific gravity of the water was measured using an H-B Instrument Polycarbonate Hydrometer (Pennsylvania, USA), with a specific gravity range of 1.20–1.42 and NIST calibrated to achieve an accuracy within 0.002. The density of the water and salt concentration was maintained at a specific gravity between 1.25–1.26 for all float sessions. Consequently, stimulation from tactile, vestibular, gravitational, and proprioceptive channels is minimized by the body's immersion in the dense saline solution, buffering the body against the forces of gravity and allowing the individual to effortlessly float on their back in a state of stillness. The importance of "stillness" is also emphasized during the pre-float instruction set ([S1 Floatation-REST procedure](#)), further helping to reduce both movement and speech.

Water disinfection. Beyond the natural sanitation created by the high concentration of salt, the water inside the float pool is reverse osmosis water that is circulated through a powerful disinfection system which includes surface skimming, 10-micron filtration, 6 ultraviolet (UV) lights, and 35% Hydrogen Peroxide (H_2O_2) maintained at ~50ppm. The unique combination of UV with H_2O_2 generates a free hydroxyl radical that is nearly twice as powerful as chlorine at oxidizing and destroying microorganisms [71], while also ensuring that no dangerous byproducts or scented odors are emitted into the air during the oxidative process (a major advantage over other disinfection systems which use chlorine, bromine, or ozone). Between every participant, the water is continuously circulated through the disinfection system, with a minimum of 4 turnovers.

Procedures. Participants were instructed that they could float for "up to 60 minutes" and could end the float at any time. Since this was the first Floatation-REST study investigating participants with moderate to severe anxiety and depression across a spectrum of different clinical diagnoses, several extra precautions were taken to ensure the safety of every participant. All procedures were administered by individuals with training in mental health and medical care (including a clinical neuropsychologist and a medical doctor). Each participant was provided with a thorough overview of the procedure during the informed consent process and was encouraged to ask questions and express any worries or concerns that they might have.

Participants were also informed that they could ask questions or speak to the experimenter at any time during the float through the intercom system. A microphone located inside the float room provided a real-time continuous audio feed to a nearby control room, where the experimenter remained throughout the float session so that they could quickly address any issues that may arise. In addition, a debriefing interview took place after every float session so that the experimenter could assess whether or not any adverse events had taken place, and address them accordingly prior to the participant leaving. Additional procedures were created to help standardize testing across participants (see [S1 Floatation-REST procedure](#)).

Statistical analysis

Sixteen different measures were collected before and after each float session. The score for each measure was converted into a POMP score, standardized units representing the “Percent Of Maximum Possible” for each measure, ranging from 0–100% [72]. Pre- to post-float change scores were computed for each measure and the effect size (Cohen’s *d*) was estimated by dividing the group’s mean change score with the standard deviation of changes [73]. A 95% confidence interval for each effect size was estimated by percentile approach using 10,000 bootstraps. Within the Anxious Group, the pre-post changes were compared by linear mixed-effects models (LMM) using Time (Post vs. Pre), age, gender and medication status as fixed-effects, and subject as the random (intercept) effect. It is important to note that this study was neither designed nor powered to test for subgroup differences, and therefore, all subgroup results are presented as estimated effect sizes. One subgroup analysis compared participants who were “severely anxious” on the day of testing (defined as participants who continued to meet our strict inclusion criteria of having an ASI-3 total score ≥ 30 and an OASIS score ≥ 8) with the remainder of the anxious sample. Additional analyses assessed for differential effects based on other variables, including: diagnosis (Generalized Anxiety Disorder, PTSD, Panic Disorder, Agoraphobia, Social Anxiety Disorder), sex, medication status (divided into those currently taking prescribed medication for their anxiety/depression and those who were unmedicated), and level of visual stimulation (based on whether the participant floated with the lights on or off). All analyses were performed on RStudio version 1.0.136 with R version 3.3.2, using the R packages *boot* (version 1.3–18) for bootstrap, *lme4* (version 1.1–12) for LMM, and *lmerTest* (version 2.0–33) for Satterthwaite’s degrees of freedom and *p*-values. False Discovery Rate (FDR) for multiple outcome measures were controlled by Benjamini-Hochberg’s method at a 5% level.

Results

Sample characteristics

Fifty participants who met our inclusion and exclusion criteria underwent Floatation-REST. [Table 2](#) provides details about the participant demographics and their baseline level of functioning on the day of Floatation-REST. The sample spanned the spectrum of different anxiety disorders, with many comorbidities, including a mix of Generalized Anxiety Disorder ($n = 26$), Social Anxiety Disorder ($n = 16$), Panic Disorder ($n = 12$), Agoraphobia ($n = 8$), and Post-traumatic Stress Disorder ($n = 17$). Nearly every participant ($n = 46$, or 92% of the sample) also presented with comorbid unipolar Major Depression. Forty percent of the sample ($n = 20$) was stably medicated on a selective serotonin reuptake inhibitor (SSRI) or serotonin–norepinephrine reuptake inhibitor (SNRI), and 8 participants were also taking a benzodiazepine (of note, none of the participants reported taking a benzodiazepine the day of their float session). On the day of Floatation-REST, most participants were acutely anxious (average OASIS score = 9.6) and depressed (average PHQ-9 score = 11.4), with average scores in the clinical range of severity. Participants also presented with high levels of perceived life stress (average PSS

score = 25.7) and anxiety sensitivity (average ASI-3 total score = 26.6), as well as marked impairment in social and occupational functioning (average total disability score on the SDS = 13.5). Consistent with their high level of distress and impairment, participants reported spending most of their time in a state of unhappiness (average net-time happiness = -7.3). The severely anxious subgroup, comprised of the participants who continued to meet our strict inclusion criteria of an ASI-3 total score ≥ 30 and an OASIS score ≥ 8 when measured the day of Floatation-REST, also reported more severe symptoms (of both anxiety and depression), along with greater levels of distress and disability.

Safety and tolerability of intervention

There were no serious adverse events or major safety concerns arising during this initial float session. Most participants (48/50) chose to float for the entire hour (S1 Fig). Only 2 participants ended their float session early, with one participant exiting 48 minutes into their float, and the other exiting after 22 minutes. The latter participant informed us during debriefing that she had exited early due to the salt water causing a stinging sensation on her back where she apparently had several small cuts that she was unaware of beforehand. Roughly half of the participants ($n = 24$) chose to float with the blue light on for most of the session (average time in dark = 2.1 minutes), whereas the other half of participants ($n = 26$) chose to float with the blue light off for most of the session (average time in dark = 53.4 minutes)(S1 Fig). At the end of the float, when participants were queried about the 60 minute float duration, 24 participants (48%) said they wanted to stay in longer, 15 participants (30%) said it was the perfect amount of time, and 11 participants (22%) said they were ready to get out before the hour had elapsed.

On the side effect checklist (Fig 3) there were very few instances of negative side effects, with the two most prominent being occasional reports of mild itchiness and dry mouth. Two-thirds of the items described a range of different negative experiences, and the other one-third of items probed a range of different positive experiences. For any response on the checklist other than “None”, a free-response box allowed participants to describe their experience in more detail. Items in pink (Fig 3) refer to potentially negative experiences that were described by participants in a positive light (e.g., for *Out-of-Body experiences* one participant wrote, “At times I felt completely out of my body in a pleasant way” and for *Feeling detached from the world around you* they wrote, “I felt detached from the world in a good way while floating as if I was in a sanctuary”). Reports of visual or auditory hallucinations were a low base rate event. When hallucinations were reported, they were always nondescript and described in positive terms, with the most common report being visions of various colors and shapes: “I saw these lines that were moving yellowish, gold in color”, “Visual lights and color, very pretty and relaxing”, “It was completely dark, but a halo of light was coming up from the pool”, “I saw little flashes of light like starbursts randomly in different places. It was beautiful.”

One subject reported a notable adverse experience comprised of extreme feelings of intense anxiety and paranoia (“For the first twenty or so minutes, I had severe anxiety. The next 20 were spent calming myself down and trying to enjoy the float”) accompanied by mild difficulty breathing and heart palpitations, as well as bothersome thoughts (“For the first half, I felt irrationally frightened and in danger”). During debriefing, she reported that she had experienced a panic attack which started at the very beginning of her float, and proceeded to heighten in intensity during the first 20 minutes. The feeling, however, was not strong enough to cause her to exit the pool, and by the end of her float session she had fully recovered and reported a marked absence of fear, anxiety, or panic, that was replaced by “extreme” positive feelings on the side effect checklist including total serenity and peacefulness, total relaxation of body, and complete silence of mind (without any anxious thoughts or worries).

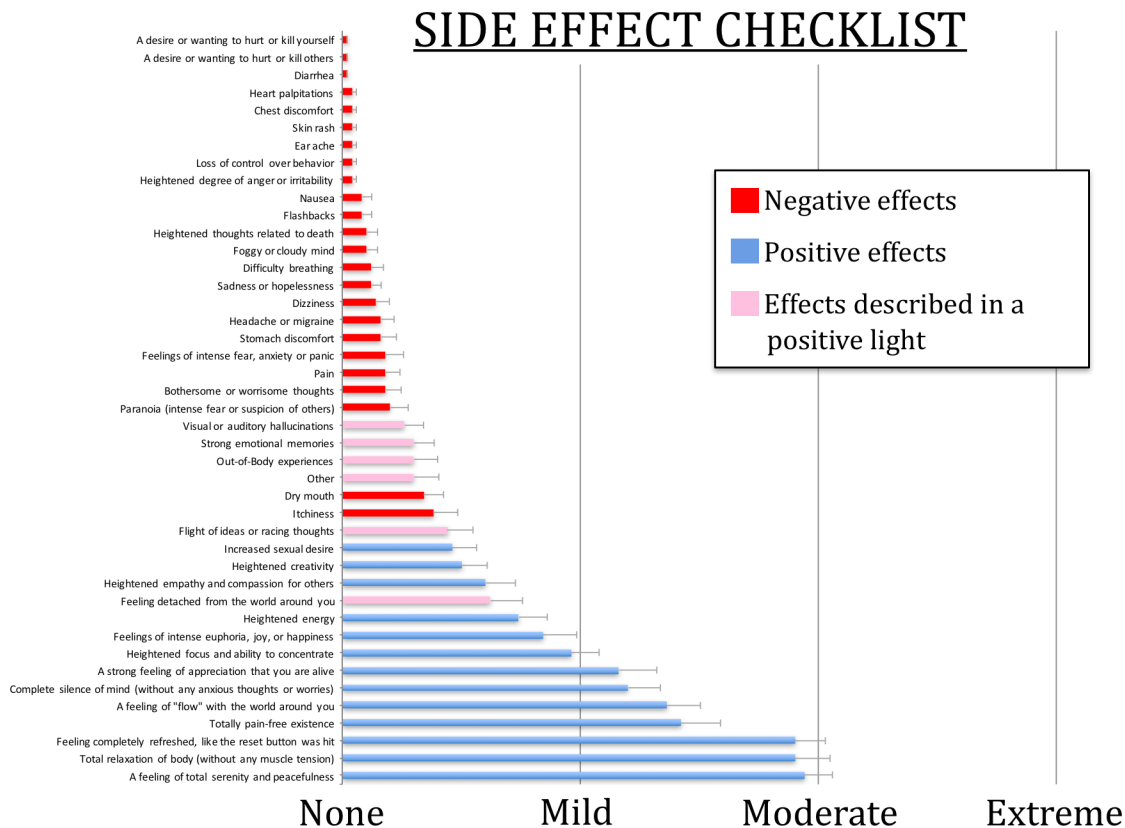


Fig 3. Side effect checklist. After the float session, participants completed a 43-item side effect checklist. For each item participants selected one of four choices (None, Mild, Moderate, or Extreme) and each choice was automatically scored as a number (0, 1, 2, or 3). Shown here is the average score across the group of 50 anxious and depressed participants, with error bars representing the standard error of the mean (SEM).

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Far more common were reports of positive experiences, with many participants endorsing positive effects in the “moderate” to “extreme” range of intensity. Despite there being twice as many negative options as positive options listed on the checklist, reports of positive experiences overshadowed all of the negative experiences. The top 10 rated effects were all positive (Fig 3), with the top 3 being “A feeling of total serenity and peacefulness”, “Total relaxation of body (without any muscle tension)”, and “Feeling completely refreshed, like the reset button was hit.” The preponderance of positive experiences was further highlighted in the debriefing interviews, where many participants reported that the float experience had a very powerful effect (see [S1 Debriefing Interview Transcriptions](#)).

Impact of Floatation-REST on clinically relevant symptoms

On our primary outcome measure, the float experience induced a reduction in self-reported state anxiety that was evident across all 50 participants (Fig 4A). Moreover, when compared to the non-anxious reference sample, the anxious group’s post-float state anxiety approached non-anxious levels (Fig 4B). Across the different pre/post-float measures there were a number of significant effects found in the anxious sample (Fig 5). Significant reductions were observed in state anxiety, stress, muscle tension, pain, depression, and negative affect (all changes were significant at $p < .0001$). There was also a substantial improvement in mood characterized by increases in serenity, relaxation, happiness, positive affect, overall well-being, energy levels,

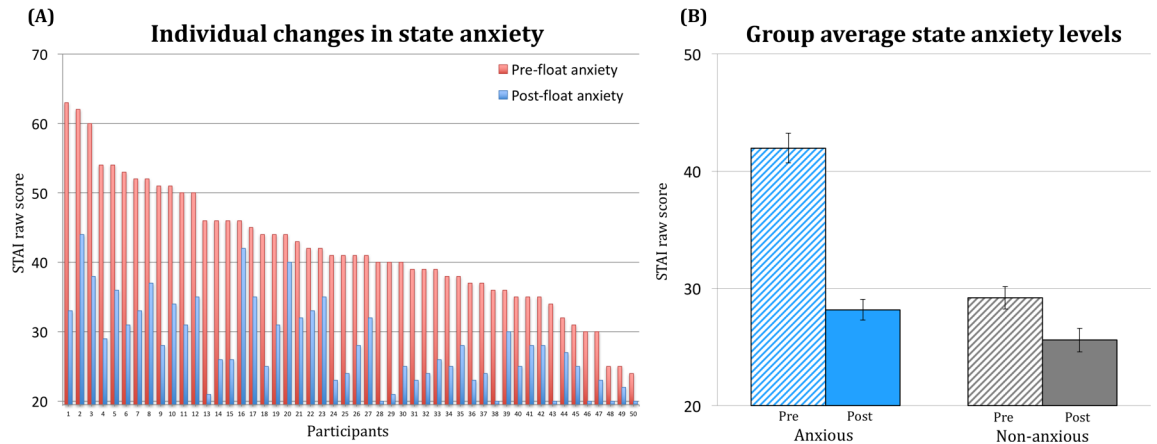


Fig 4. Impact of Floatation-REST on state anxiety. (A) The float experience caused a reduction in state anxiety that was evident across all 50 participants, leading to a significant pre- to post-float change on the Spielberger State Anxiety Inventory (STAI) at the group level [$t(49) = -15.16, p < .0001, d = 2.15$]. (B) Despite a large baseline difference, the anxious group's average post-float anxiety had reached levels slightly lower than the pre-float anxiety reported by the non-anxious reference sample. Error bars represent the SEM.

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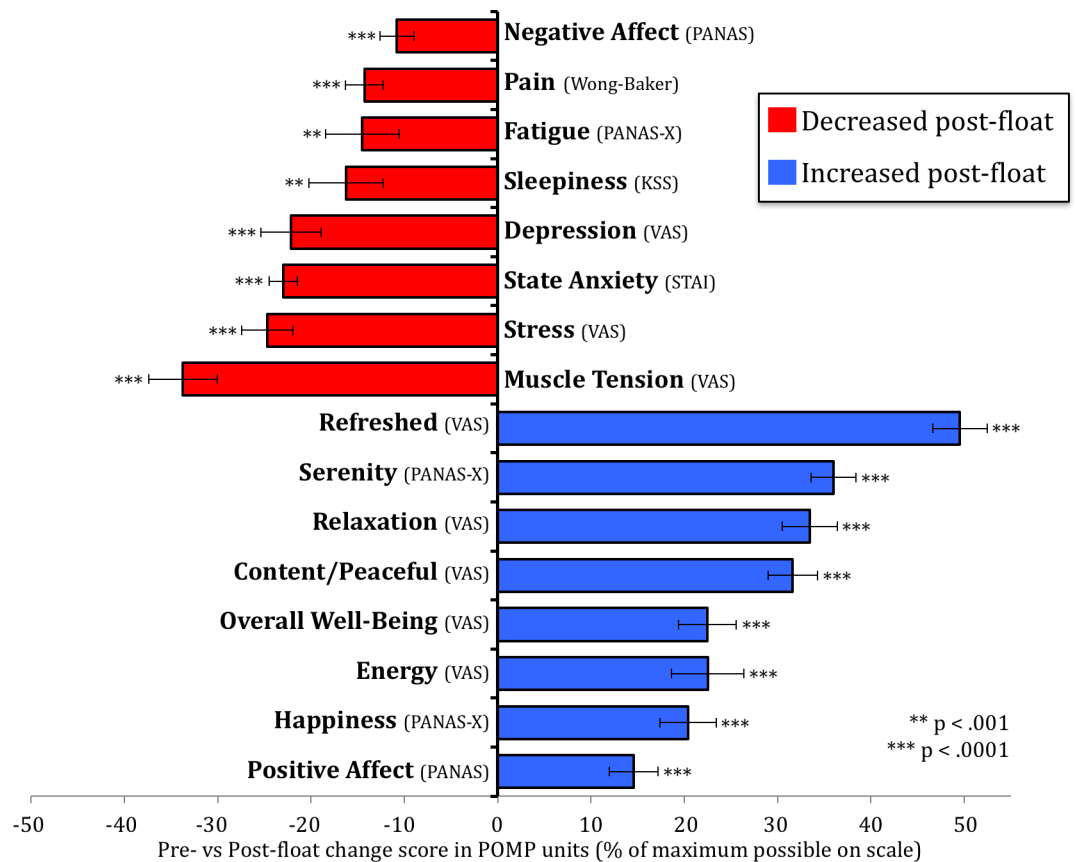


Fig 5. Impact of Floatation-REST on mood and affect. Change scores from pre- to post-float are shown for all 16 measures. To facilitate comparisons across measures the score for each measure was converted to POMP units representing the percent of maximum possible on each scale. All measures showed a significant pre- to post-float change with the significance level denoted with asterisks. Error bars represent the SEM.

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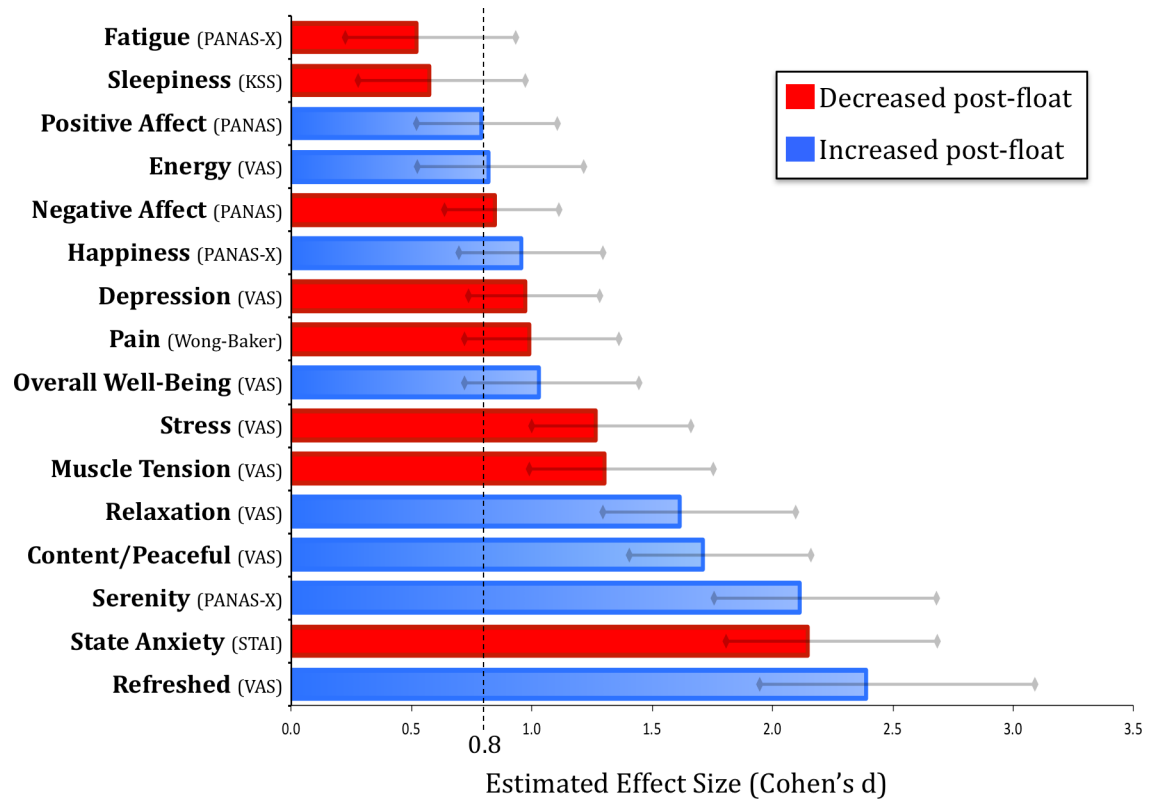


Fig 6. Estimated effect size of a single float session in patients with anxiety and depression. The estimated Cohen's d is shown for each pre- to post-float change score, with grey lines representing the 95% confidence interval. The dashed black line demarcates the starting point ($d = 0.8$) for what is considered a "large effect size" [73].

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and feeling refreshed, content and peaceful (all changes were significant at $p < .0001$). In reference to the non-anxious sample (comprised of participants who were also naïve to floating), the anxious group reported experiencing float-induced changes that were considerably larger in magnitude (S2 Fig). Effect size estimates for each of the variables in the anxious sample revealed that most effect sizes ranged from large to very large (Fig 6). The largest effects were reductions in state anxiety ($d = 2.15$) and increases in serenity ($d = 2.11$) and feeling refreshed ($d = 2.39$).

Exploratory analyses. Subgroup analyses revealed similarly large effect sizes irrespective of diagnosis, sex, medication status, and level of visual stimulation during the float (S3 Fig). There were only a few modest differences between conditions or diagnostic categories. For example, individuals who floated with the lights on (vs off) tended to experience smaller effects on several measures including serenity ($d = 1.79$ vs 2.51), overall well-being ($d = .78$ vs 1.39), stress ($d = -.95$ vs -1.72), and negative affect ($d = -.65$ vs -1.05), whereas state anxiety reduction showed a similar effect regardless of having the lights on or off ($d = -2.19$ vs -2.15). In general, measures of fatigue and sleepiness displayed the smallest effects and most variability between subgroups; for example, the Social Anxiety Disorder subgroup had very small effects with regard to fatigue ($d = -.17$), whereas the PTSD subgroup had large post-float reductions in fatigue ($d = -.96$). On key symptom-related variables—such as reductions in state anxiety, stress, depression, and negative affect—the effect sizes were consistently large across all subgroups (S3 Fig). Further analysis revealed that the largest effects occurred in the most severely anxious participants (S4 Fig).

On the follow-up questions, all 50 participants requested to float again, and 47 of the participants thought that floating had the potential to be an effective therapy for reducing stress and anxiety and improving mood. Nearly three-quarters of the sample (37 participants) reported that they achieved more relaxation with floating than any other treatment or technique they had tried in the past (S5 Fig).

Discussion

This study found that a single one-hour session of Floatation-REST was capable of inducing a strong reduction in state anxiety and a substantial improvement in mood in a group of 50 anxious and depressed participants spanning a range of different anxiety and stress-related disorders (including PTSD, Generalized Anxiety Disorder, Panic Disorder, Agoraphobia, and Social Anxiety Disorder). The findings from this open-label study suggest that Floatation-REST may be a promising technique for acutely reducing symptoms of anxiety and depression, although the persistence of these effects is presently unknown. With regard to our primary outcome measure, the reduction in state anxiety was evident in every participant regardless of sex or medication status (Fig 4A). Moreover, the anxiety reduction was robust, with an estimated Cohen's $d > 2$ across all disorders and subgroups (S3 Fig). Beyond the immediate dissipation of anxiety, the float experience also induced a significant decrease ($p < .0001$) in self-reported stress, muscle tension, pain, depression, and negative affect, along with a significant increase ($p < .0001$) in serenity, relaxation, happiness, positive affect, overall well-being, energy levels, and feeling refreshed, content and peaceful (Fig 5), with estimated effect sizes ranging from large to very large across variables (Fig 6).

On key symptom-related variables—such as reductions in state anxiety, stress, depression, and negative affect—the effect sizes were consistently large across all tested diagnostic categories (S3 Fig). An exploratory subgroup analysis revealed that those with the most severe anxiety reported the largest effects (S4 Fig). This latter finding is notable given the fact that the severely anxious participants reported having the most severe impairments in life functioning (Table 2), and also tended to be the most resistant to other forms of treatment; approximately two-thirds of the severely anxious participants were currently taking an SSRI or SNRI, and over three-quarters had tried psychotherapy. Indeed, most participants in this study reported having tried a number of other techniques to help them relax and feel less anxious and stressed (S5 Fig). Of potential clinical relevance, nearly 75% of the entire sample, and 82% of the severely anxious subgroup, reported that they had achieved more relaxation with Floatation-REST than any of the other treatments or techniques they had tried in the past (S5 Fig). While demand characteristics, expectancy effects, novelty effects, and retrospective recall biases may be inflating these subjective comparisons with other therapeutic modalities, the debriefing interviews (S1 Debriefing interview transcriptions) revealed that the float experience had a powerful positive effect on many of the participants. In future studies, it will be important to assess whether such positive effects can be maintained, or even further improved, with repeated sessions of Floatation-REST.

In comparison to previous float studies [21], the effect sizes observed in our anxious and depressed sample were about twice as large. Since many of the previous studies tested healthy participants, this noted disparity in effects may be driven by the possibility that Floatation-REST provides the largest effect to those who bring the most stress into the float experience. Such an interpretation is consistent with the larger float-induced changes observed in the severely anxious subgroup (S4 Fig), and the relatively small float-induced changes observed in the non-anxious reference sample (S2 Fig). While this study was not designed to directly compare anxious to healthy samples, the limited data we have on this matter suggests that Floatation-REST may temporarily lower state anxiety to near-normal levels (Fig 4B).

Although mood and anxiety disorders are heterogeneous in terms of their diversity of symptoms and emotional triggers, recent efforts have attempted to develop more effective treatments that can work in a transdiagnostic manner [74–76]. Transdiagnostic treatments have the obvious advantage of being easier to disseminate and more widely applicable, especially given the high rate of comorbidity between the different mood and anxiety disorders. To our knowledge, this is the first Floatation-REST trial in individuals across the spectrum of anxiety and depression, with results showing clear signs of short-term benefit in PTSD, Generalized Anxiety Disorder, Panic Disorder, Agoraphobia, Social Anxiety Disorder, and Major Depression. Previous float research with psychiatric populations did not assess the short-term effects following a single float session, but did assess the long-term effects (up to 6 months post-treatment) following 12 float sessions, and found evidence for sustained long-term benefit in individuals with generalized anxiety [26] or burnout depression [7, 25]. Together, these findings suggest that Floatation-REST may have the potential to be a viable transdiagnostic therapy for relieving symptoms of anxiety and depression.

Anxiety and depression affect over a quarter of the population, yet more than three-quarters of patients never receive treatment [35, 77]. This utilization problem is even worse in patients with social phobia [78, 79] or multiple comorbidities [77, 78, 80]. Novel non-pharmacological therapies for anxiety and depression are desperately needed, and the promising results of this initial Floatation-REST trial warrant further investigation, especially given the insufficient response rates and adherence to currently available treatments [39–42], and the paucity of novel medications reaching market over the past two decades [38]. In addition, many medications come with a host of side effects, which further contributes to the poor rates of adherence. The barriers to treatment utilization are complicated, but one of the most common reasons why patients with mood and anxiety disorders fail to receive treatment is due to the notion that they want to solve the problem on their own [81]. In this regard, Floatation-REST may offer an attractive alternative option that enhances self-efficacy and improves treatment utilization by providing anxious patients with the opportunity to learn new ways of coping with distress on their own. In addition, Floatation-REST appeared to be well-tolerated by this sample, with minimal evidence of harm, adverse events or major safety concerns arising during the initial float session. Positive experiences outweighed all negative experiences, and consequently, 96% of the participants chose to float for the entire hour, and 100% of the participants requested to float again. The non-pharmacological nature of Floatation-REST, combined with its lack of side effects, ease of use, and rapid onset of benefit, are additional positive attributes that may further improve treatment utilization and adherence.

A note on “sensory deprivation”

In contrast to the prevailing positive experience reported post-float, there were clear signs of pre-float anticipatory anxiety and avoidance behavior. Fifteen participants failed to show for their scheduled appointment and never rescheduled (Fig 1), and another fifteen participants called to reschedule their appointment, often at the last minute. While it is not uncommon for anxious individuals to avoid novel experiences, it is worth noting the heightened anticipatory anxiety that anxious patients may have about Floatation-REST, as this creates a clear barrier to entry. One potential reason for the anticipatory anxiety of Floatation-REST may stem from its association with “sensory deprivation”, a loaded term which engenders many historical, and often incorrect, stereotypes related to a loss of control, hallucinations, paranoia and panic [82, 83]. The relaxing and serene state induced by Floatation-REST in the current study appears to be very different (in fact, polar opposite) to the unpleasant and anxious states that were sometimes reported in sensory deprivation research from the 1950’s that did not involve floating in

a pool of water [82, 83]. Similarly, Chamber-REST research, which has participants lie in a dark sound-attenuated room, has also found a general lack of negative effects induced by the experience, even in experiments lasting 24 hours in duration, whereas positive benefits of Chamber-REST have been observed across a number of conditions including autism, smoking addiction, and even snake phobia [27]. Given the striking discrepancy between the positive effects found in modern day REST research and negative effects found in early sensory deprivation research, the term *sensory deprivation* has largely been replaced by *restricted environmental stimulation therapy* (“REST”) [82]. We strongly agree with this replacement, as it helps to avoid confusion and steer clear of historical stereotypes that may heighten the barrier to entry for anxious populations. In this paper, we refer to the first term in the REST acronym as “reduced” instead of the more commonly used term of “restricted” in order to further minimize any potential negative associations that may be elicited by this latter term.

Considerations for replication

As mentioned in the Introduction, there are now hundreds of recreational float centers (<http://floatationlocations.com/where-to-float/>) where consumers can pay money to float, typically ranging between \$40-\$100 per session. It is not yet clear whether the anxiety reducing effects found in the different clinical populations studied here can be fully replicated in recreational facilities. In contrast to the open pool design employed in this study, most recreational facilities have enclosed floatation tanks. Enclosed tanks may heighten the anxiety in patients, especially if they have any claustrophobia. In addition, many enclosed tanks fail to ventilate the air near the surface of the water, allowing for the build-up of high levels of humidity and carbon dioxide, which can further heighten anxiety.

Additional precautions were also taken to provide participants with complete control over the float experience, including having the ability to turn the lights on or off using an infrared wave detection system. In contrast, many float centers do not offer this option, and some float tanks do not even have a light. Likewise, all participants in this study received a thorough introduction prior to their float experience by a mental health professional, and were continuously monitored throughout the experience using an intercom system. These factors may have increased the participants’ overall level of safety and comfort, and may have also diminished the base rate of adverse events. Thus, the optimized setting created in this study may have contributed to the positive results.

Limitations & future directions

Although the findings from this initial study provide early indications for a clinically meaningful signal in anxious and depressed individuals, many important questions remain. The study was limited by its open-label design and lack of a control group. Moreover, since this was only a single-float study, it will be imperative for future studies to explore the effects of multiple float sessions to determine whether there is any evidence for sustained long-term benefit or any sign of adverse effects from repeated sessions. In addition, no studies have examined how long the acute effects persist after a float is over, and a better understanding for the duration of the acute effects will be important prior to determining other factors such as the optimal “dose” of floating. It will be incumbent upon future research to explore how long the benefits last after a single float session, and whether the persistence of such effects changes following multiple float sessions. Replication using a randomized controlled design with longitudinal follow-up will be a critical step for assessing the efficacy of Floatation-REST in anxious and depressed populations. It will also be important to identify a good comparator condition that controls for the effects of expectation and assesses the degree to which the relaxation benefits

can be obtained in a setting outside of the float pool. Notably, the selection of a comparator should be based on the specific hypothesis and there is unlikely to be a “one size fits all” solution as the specific target of treatment could change based on the clinical population under investigation. The current investigation targeted state anxiety, and the findings revealed that the reduction of state anxiety was consistently the largest effect across all subgroups and diagnostic categories (S3 Fig), highlighting this metric as a useful target for future investigations.

Despite over a half-century of investigation, the science of Floatation-REST is still in its very early stages. Given the large number of sensory systems altered by the float experience, it is currently unclear what factors are driving the positive effects. Culturally speaking, modern society is in the midst of a technological renaissance that has created a near constant state of connectivity. Addiction to social media and technology has become rampant [84], making it increasingly difficult to unplug for even a single day [85]. And while many find the prospect of being alone and doing nothing for even a short period of time to be aversive [86], the current results suggest that occasionally ‘disconnecting’ from technology and providing the nervous system with a respite from outside stimulation might actually be conducive for mental health. Beyond the potential mental benefits, Floatation-REST also seems to provide clear physical benefits, as our data revealed large reductions in muscle tension and pain, with muscle tension showing the largest reduction out of all the measures (Fig 5). Since the body can harbor stress [87], often in the form of muscle tension and pain, it remains possible that many of the positive benefits derived from Floatation-REST are being driven through the body-based nature of the intervention. Reductions in somatomotor activity and exteroceptive sensory input may also play a role in the positive benefits, but it is currently difficult to discern the precise extent. For example, having the lights off during the float session provided some advantages (in terms of effect size) on measures of serenity, well-being, stress, and negative affect, but it did not alter the overall level of state anxiety reduction, which remained high regardless of whether the lights were on or off. Thus, it seems plausible that the clinical impact of Floatation-REST could be a byproduct or summation of all the different sensory and motor systems that are altered by the float experience, rather than any single system driving the change by itself. Many possibilities exist and future research will need to decipher how floating affects the nervous system in order to isolate the active ingredients.

Supporting information

S1 Checklist.

(PDF)

S1 Floatation-REST Procedure.

(PDF)

S1 Fig. Floatation-REST immersion time. Each participant’s total float duration (light blue) and total time spent with the lights off (gray).

(TIF)

S2 Fig. Comparison to the non-anxious reference sample. Change scores from pre- to post-float are shown for all of the measures completed by both the anxious sample and the non-anxious reference sample. Error bars represent the SEM.

(TIF)

S3 Fig. Effect size estimates for different subgroup analyses. The estimated Cohen’s *d* is color-coded and displayed for each pre- to post-float change score for the different subgroup analyses. The acute float effects were found to be large irrespective of diagnosis, sex,

medication status, and level of visual stimulation.
(TIF)

S4 Fig. Floatation-REST in the severely anxious subgroup. Average change scores from pre- to post-float in the severely anxious participants ($n = 17$) in comparison to the remainder of the anxious sample ($n = 33$). Error bars represent the SEM.

(TIF)

S5 Fig. Subjective comparison of the relaxation induced by Floatation-REST to other relaxation techniques. (A) Percentage of participants (out of the group of 50) who selected one of three possible answer choices comparing the relaxation induced by floating to (B) other relaxation techniques they have tried in the past.

(TIF)

S1 Debriefing Interview Transcriptions.

(PDF)

S1 Protocol.

(PDF)

S1 Data.

(XLSX)

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References

1. Lilly JC, Shurley JT. Experiments in solitude in maximum achievable physical isolation with water suspension of intact healthy persons. *Psychophysiological aspects of space flight*. New York: Columbia University Press; 1961. p. 238–47.
2. Shurley JT. Profound experimental sensory isolation. *American Journal of Psychiatry*. 1960; 117(6):539–45.
3. Shurley J. Stress and adaptation as related to sensory/perceptual isolation research. *Military medicine*. 1966; 131(3):254–8. PMID: [4955753](#)
4. Nolen S. *Promised the moon: the untold story of the first women in the space race*: Basic Books; 2004.
5. Lilly JC. *The deep self: The tank method of physical isolation*. New York, Simon and Schuster; 1977.
6. Suedfeld P, Ballard EJ, Murphy M. Water immersion and flotation: From stress experiment to stress treatment. *Journal of Environmental Psychology*. 1983; 3(2):147–55.
7. Bood SÅ, Sundequist U, Kjellgren A, Norlander T, Nordström L, Nordenström K, et al. Eliciting the relaxation response with the help of flotation-rest (restricted environmental stimulation technique) in patients with stress-related ailments. *International Journal of Stress Management*. 2006; 13(2):154–75. <https://doi.org/10.1037/1072-5245.13.2.154>
8. Kjellgren A, Westman J. Beneficial effects of treatment with sensory isolation in flotation-tank as a preventive health-care intervention—a randomized controlled pilot trial. *BMC complementary and alternative medicine*. 2014; 14(1):417.
9. Barabasz A, Barabasz M, Dyer R, Rather N. Effects of chamber REST, flotation REST and relaxation on transient mood state. *Clinical and experimental restricted environmental stimulation*: Springer; 1993. p. 113–20.
10. Pudvah MB, Rzewnicki R. Six Months in the Tank: The Long-Term Effects of Flotation Isolation on State Anxiety, Hostility and Depression. In: Turner J Jr, Fine T, editors. *Restricted Environmental Stimulation: Research and Commentary*. Toledo, Ohio: Medical College of Ohio Press; 1990. p. 79–85.
11. Forgays DG, Belinson MJ. Is flotation isolation a relaxing environment? *Journal of Environmental Psychology*. 1986; 6(1):19–34.
12. Jacobs GD, Heilbronner RL, Stanley JM. The effects of short term flotation REST on relaxation: a controlled study. *Health Psychology*. 1984; 3(2):99–112. PMID: [6399246](#)
13. O’Leary DS, Heilbronner RL. Flotation REST and information processing: A reaction time study. *Restricted Environmental Stimulation*: Springer; 1990. p. 113–24.
14. Fine TH, Turner JW. The effect of brief restricted environmental stimulation therapy in the treatment of essential hypertension. *Behaviour research and therapy*. 1982; 20(6):567–70. PMID: [7159352](#)
15. Turner JW, Fine T, Ewy G, Sershon P, Freundlich T. The presence or absence of light during flotation restricted environmental stimulation: Effects on plasma cortisol, blood pressure, and mood. *Applied Psychophysiology and Biofeedback*. 1989; 14(4):291–300.
16. Turner JW Jr, Fine TH, McGrady A, Higgins JT. Effects of biobehaviorally assisted relaxation training on blood pressure and hormone levels and their variation in normotensives and essential hypertensives. *Restricted Environmental Stimulation*: Springer; 1990. p. 184–201.
17. Turner J Jr, Gerard W, Hyland J, Nieland P, Fine T. Effects of wet and dry flotation REST on blood pressure and plasma cortisol. *Clinical and Experimental Restricted Environmental Stimulation*: Springer; 1993. p. 239–47.
18. Turner JW, Fine TH. Effects of relaxation associated with brief restricted environmental stimulation therapy (REST) on plasma cortisol, ACTH, and LH. *Applied Psychophysiology and Biofeedback*. 1983; 8(1):115–26.
19. Turner J, Fine TH. Restricting environmental stimulation influences levels and variability of plasma cortisol. *Journal of Applied Physiology*. 1991; 70(5):2010–3. <https://doi.org/10.1152/jappl.1991.70.5.2010> PMID: [1864782](#)
20. Schulz P, Kaspar C-H. Neuroendocrine and psychological effects of restricted environmental stimulation technique in a flotation tank. *Biological psychology*. 1994; 37(2):161–75. PMID: [8003591](#)
21. van Dierendonck D, Te Nijenhuis J. Flotation restricted environmental stimulation therapy (REST) as a stress-management tool: A meta-analysis. *Psychology & Health*. 2005; 20(3):405–12. <https://doi.org/10.1080/08870440412331337093>

22. Wallbaum AB, Rzewnicki R, Steele H, Suedfeld P. Progressive muscle relaxation and restricted environmental stimulation therapy for chronic tension headache: a pilot study. *International Journal of Psychosomatics*. 1991; 38:33–9. PMID: [1778683](#)
23. Koula GM, Kemp JC, Keane KM, Belden AD. Replication of a clinical outcome study on a hospital-based stress management and behavioral medicine program utilizing flotation REST and biofeedback. *Restricted Environmental Stimulation*: Springer; 1990. p. 202–9.
24. Kjellgren A, Sundequist U, Norlander T, Archer T. Effects of flotation-REST on muscle tension pain. *Pain Research and Management*. 2001; 6(4):181–9. PMID: [11854763](#)
25. Bood SA, Sundequist U, Kjellgren A, Nordstrom G, Norlander T. Effects of flotation-restricted environmental stimulation technique on stress-related muscle pain: What makes the difference in therapy-attention-placebo or the relaxation response? *Pain Research and Management*. 2005; 10(4):201–9. PMID: [16341307](#)
26. Jonsson K, Kjellgren A. Promising effects of treatment with flotation-REST (restricted environmental stimulation technique) as an intervention for generalized anxiety disorder (GAD): a randomized controlled pilot trial. *BMC complementary and alternative medicine*. 2016; 16:108. <https://doi.org/10.1186/s12906-016-1089-x> PMID: [27016217](#)
27. Suedfeld P, Borrie RA. Health and therapeutic applications of chamber and flotation restricted environmental stimulation therapy (REST). *Psychology & Health*. 1999; 14(3):545–66.
28. Kjellgren A, Edebol H, Nord, eacuten T, Norlander T. Quality of Life with Flotation Therapy for a Person Diagnosed with Attention Deficit Disorder, Atypical Autism, PTSD, Anxiety and Depression. *Open Journal of Medical Psychology*. 2013; 02(03):134–8. <https://doi.org/10.4236/ojmp.2013.23020>
29. Kessler RC, Avenevoli S, Costello EJ, Georgiades K, Green JG, Gruber MJ, et al. Prevalence, persistence, and sociodemographic correlates of DSM-IV disorders in the National Comorbidity Survey Replication Adolescent Supplement. *Archives of general psychiatry*. 2012; 69(4):372–80. <https://doi.org/10.1001/archgenpsychiatry.2011.160> PMID: [22147808](#); PubMed Central PMCID: [PMC3445020](#).
30. Lamers F, van Oppen P, Comijs H, Smit J, Spinhoven P, van Balkom AJ, et al. Comorbidity Patterns of Anxiety and Depressive Disorders in a Large Cohort Study: the Netherlands Study of Depression and Anxiety (NESDA) *Journal of Clinical Psychiatry* 2011; 72(3):341–8. <https://doi.org/10.4088/JCP.10m06176blu> PMID: [21294994](#)
31. Mikea S, Watson D, Clark LA. Comorbidity of Anxiety and Unipolar Mood Disorders. *Annual Review of Psychology* 1998;(49):377–412.
32. Depression and other common mental disorders: global health estimates. Geneva: World Health Organization, 2017 Contract No.: CC BY-NC-SA 3.0 IGO.
33. Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. *The Lancet*. 2013; 382(9904):1575–86.
34. Baxter A, Vos T, Scott K, Ferrari A, Whiteford H. The global burden of anxiety disorders in 2010. *Psychological medicine*. 2014; 44(11):2363–74. <https://doi.org/10.1017/S0033291713003243> PMID: [24451993](#)
35. Collins KA, Westra HA, Dozois DJ, Burns DD. Gaps in accessing treatment for anxiety and depression: challenges for the delivery of care. *Clinical psychology review*. 2004; 24(5):583–616. <https://doi.org/10.1016/j.cpr.2004.06.001> PMID: [15325746](#).
36. Bruce SE, Yonkers KA, Otto MW, Eisen JL, Weisberg RB, Pagano M, et al. Influence of psychiatric comorbidity on recovery and recurrence in generalized anxiety disorder, social phobia, and panic disorder: a 12-year prospective study. *American Journal of Psychiatry*. 2005; 162(6):1179–87. <https://doi.org/10.1176/appi.ajp.162.6.1179> PMID: [15930067](#)
37. Craske MG, Stein MB. Anxiety. *The Lancet*. 2016; 388(10063):3048–59. [https://doi.org/10.1016/s0140-6736\(16\)30381-6](https://doi.org/10.1016/s0140-6736(16)30381-6)
38. Stein MB, Craske MG. Treating Anxiety in 2017: Optimizing Care to Improve Outcomes. *JAMA*. 2017.
39. Loerinc AG, Meuret AE, Twohig MP, Rosenfield D, Bluett EJ, Craske MG. Response rates for CBT for anxiety disorders: Need for standardized criteria. *Clinical psychology review*. 2015; 42:72–82. <https://doi.org/10.1016/j.cpr.2015.08.004> PMID: [26319194](#).
40. Warden D, Rush J, Trivedi M, Fava M, Wisniewski S. The STAR*D Project Results: A Comprehensive Review of Findings. *Current Psychiatry Reports*. 2007; 9:449–59. PMID: [18221624](#)
41. Fava M, Rush AJ, Alpert J, Balasubramani GK, Wisniewski S, Carmin C, et al. Difference in Treatment Outcome in Outpatients With Anxious Versus Nonanxious Depression: A STAR*D Report. *American Journal of Psychiatry* 2008; 165:342–51. <https://doi.org/10.1176/appi.ajp.2007.06111868> PMID: [18172020](#)
42. Hofmeijer-Sevink MK, Batelaan NM, van Megen HJ, Penninx BW, Cath DC, van den Hout MA, et al. Clinical relevance of comorbidity in anxiety disorders: a report from the Netherlands Study of

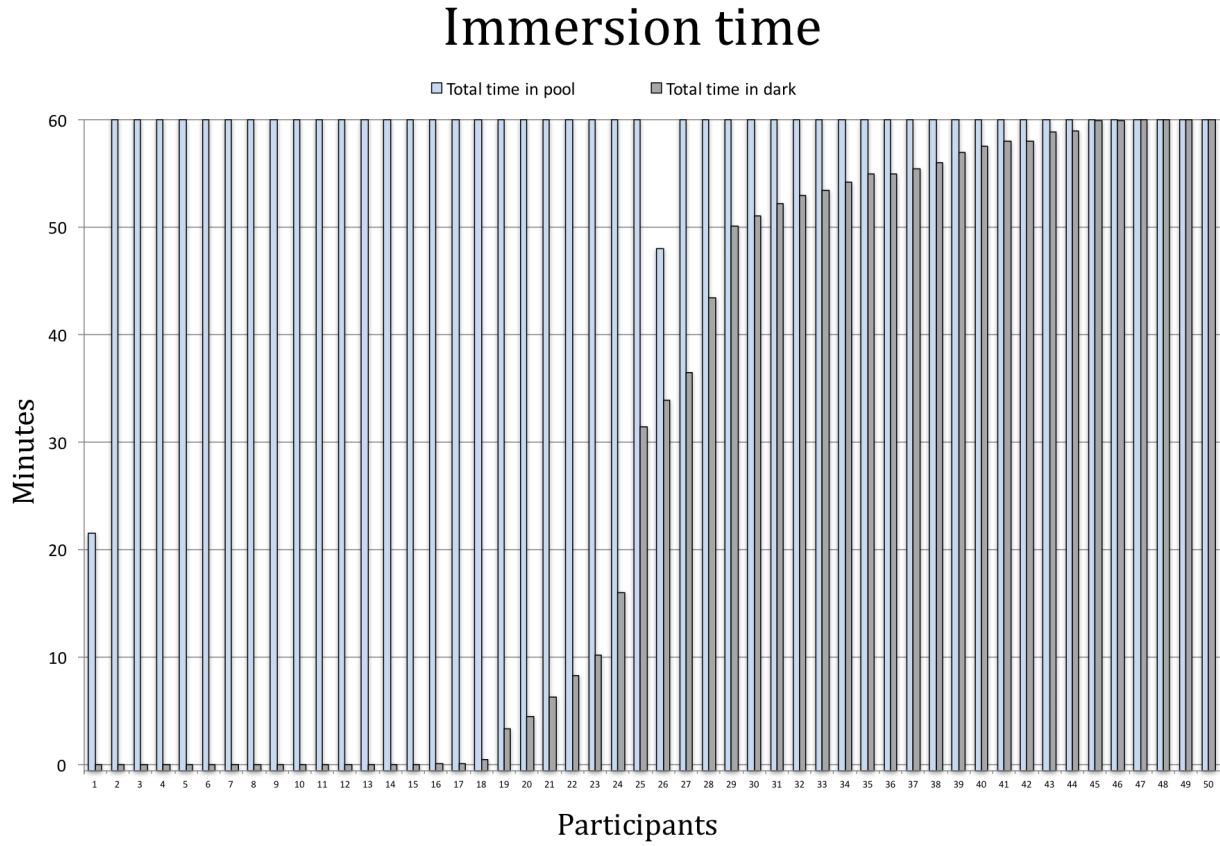
- Depression and Anxiety (NESDA). *Journal of affective disorders*. 2012; 137(1–3):106–12. <https://doi.org/10.1016/j.jad.2011.12.008> PMID: 22240085.
43. Sheehan D, Lecrubier Y, Sheehan K, Amorim P, Janavs J, Weiller E. The Mini International Neuropsychiatric Interview (MINI): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and CID-10. *Journal of Clinical Psychiatry*. 1998; 59(20):22–33.
 44. Diagnostic and statistical manual of mental disorders: DSM-IV-TR. Washington, DC: American Psychiatric Association; 2000.
 45. Taylor S. *Anxiety sensitivity: Theory, research, and treatment of the fear of anxiety*: Routledge; 2014.
 46. Naragon-Gainey K. Meta-analysis of the relations of anxiety sensitivity to the depressive and anxiety disorders. *Psychol Bull*. 2010; 136(1):128–50. Epub 2010/01/13. <https://doi.org/10.1037/a0018055> PMID: 20063929.
 47. Schmidt NB, Zvolensky MJ, Maner JK. Anxiety sensitivity: prospective prediction of panic attacks and Axis I pathology. *Journal of psychiatric research*. 2006; 40(8):691–9. <https://doi.org/10.1016/j.jpsychires.2006.07.009> PMID: 16956622
 48. Taylor S, Zvolensky MJ, Cox BJ, Deacon B, Heimberg RG, Ledley DR, et al. Robust dimensions of anxiety sensitivity: development and initial validation of the Anxiety Sensitivity Index-3. *Psychological assessment*. 2007; 19(2):176–88. <https://doi.org/10.1037/1040-3590.19.2.176> PMID: 17563199
 49. Campbell-Sills L, Norman SB, Craske MG, Sullivan G, Lang AJ, Chavira DA, et al. Validation of a brief measure of anxiety-related severity and impairment: the Overall Anxiety Severity and Impairment Scale (OASIS). *Journal of affective disorders*. 2009; 112(1):92–101.
 50. Beck JG, Shipherd JC, Read J. Response patterns to repeated CO2 inhalation in individuals with high anxiety sensitivity. *Behaviour research and therapy*. 1999; 37(11):1073–89. Epub 1999/09/29. PMID: 10500321.
 51. Beck JG, Wolf MS. Response to repeated CO2 in individuals with elevated anxiety sensitivity: replication with 20% CO2. *Journal of behavior therapy and experimental psychiatry*. 2001; 32(1):1–16. Epub 2001/12/04. PMID: 11729942.
 52. Norman SB, Hami Cissell S, Means-Christensen AJ, Stein MB. Development and validation of an overall anxiety severity and impairment scale (OASIS). *Depression and anxiety*. 2006; 23(4):245–9. <https://doi.org/10.1002/da.20182> PMID: 16688739
 53. Kroenke K, Spitzer RL, Williams JB. The phq-9. *Journal of general internal medicine*. 2001; 16(9):606–13. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x> PMID: 11556941
 54. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *Journal of health and social behavior*. 1983:385–96. PMID: 6668417
 55. Cohen S, Kamarck T, Mermelstein R. *Perceived stress scale*. Measuring stress: A guide for health and social scientists. 1994.
 56. Lee E-H. Review of the psychometric evidence of the perceived stress scale. *Asian nursing research*. 2012; 6(4):121–7. <https://doi.org/10.1016/j.anr.2012.08.004> PMID: 25031113
 57. Sheehan D. Sheehan disability scale. *Handbook of psychiatric measures*. 1983:113–5.
 58. Leon AC, Olfson M, Portera L, Farber L, Sheehan DV. Assessing psychiatric impairment in primary care with the Sheehan Disability Scale. *The international journal of psychiatry in medicine*. 1997; 27(2):93–105. <https://doi.org/10.2190/T8EM-C8YH-373N-1UWD> PMID: 9565717
 59. Sheehan KH, Sheehan DV. Assessing treatment effects in clinical trials with the discan metric of the Sheehan Disability Scale. *International clinical psychopharmacology*. 2008; 23(2):70–83. <https://doi.org/10.1097/YIC.0b013e3282f2b4d6> PMID: 18301121
 60. Fordyce MW. A review of research on the happiness measures: A sixty second index of happiness and mental health. *Social Indicators Research*. 1988; 20(4):355–81.
 61. Spielberger CD, Gorsuch RL, Lushene R, Vagg PR, Jacobs G. *State-trait anxiety inventory for adults*: Mind Garden; 1983.
 62. Uhde TW, Stein MB, Vittone BJ, Siever LJ, Boulenger J-P, Klein E, et al. Behavioral and physiologic effects of short-term and long-term administration of clonidine in panic disorder. *Archives of general psychiatry*. 1989; 46(2):170–7. PMID: 2643934
 63. Den Boer JA, Westenberg HG. Effect of a serotonin and noradrenaline uptake inhibitor in panic disorder; a double-blind comparative study with fluvoxamine and maprotiline. *International clinical psychopharmacology*. 1988; 3(1):59–74. PMID: 2833543
 64. Michalsen A, Grossman P, Acil A, Langhorst J, Lütke R, Esch T, et al. Rapid stress reduction and anxiolysis among distressed women as a consequence of a three-month intensive yoga program. *Medical Science Monitor*. 2005; 11(12):555–61.

65. Lahmann C, Schoen R, Henningsen P, Ronel J, Muehlbacher M, Loew T, et al. Brief relaxation versus music distraction in the treatment of dental anxiety: a randomized controlled clinical trial. *The Journal of the American Dental Association*. 2008; 139(3):317–24. PMID: [18310736](#)
66. Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of personality and social psychology*. 1988; 54(6):1063–70. PMID: [3397865](#)
67. Watson D, Clark LA. *The PANAS-X: Manual for the positive and negative affect schedule-expanded form*. 1999.
68. Åkerstedt T, Gillberg M. Subjective and objective sleepiness in the active individual. *International Journal of Neuroscience*. 1990; 52(1–2):29–37. PMID: [2265922](#)
69. Kaida K, Takahashi M, Åkerstedt T, Nakata A, Otsuka Y, Haratani T, et al. Validation of the Karolinska sleepiness scale against performance and EEG variables. *Clinical Neurophysiology*. 2006; 117(7):1574–81. <https://doi.org/10.1016/j.clinph.2006.03.011> PMID: [16679057](#)
70. Wong DL, Baker CM. Pain in children: comparison of assessment scales. *Pediatr Nurs*. 1988; 14(1):9–17. PMID: [3344163](#)
71. Crandall R. The use of ultraviolet light in the treatment of water in public spas and hot tubs. *Journal of Environment and Health*. 1986; 49(1):16–23.
72. Cohen P, Cohen J, Aiken LS, West SG. The problem of units and the circumstance for POMP. *Multivariate behavioral research*. 1999; 34(3):315–46.
73. Cohen J. *Statistical power analysis for the behavioral sciences*. Hillsdale, New Jersey: Lawrence Erlbaum Associates; 1988.
74. Boswell JF, Farchione TJ, Sauer-Zavala S, Murray HW, Fortune MR, Barlow DH. Anxiety sensitivity and interoceptive exposure: a transdiagnostic construct and change strategy. *Behavior therapy*. 2013; 44(3):417–31. <https://doi.org/10.1016/j.beth.2013.03.006> PMID: [23768669](#); PubMed Central PMCID: PMC3727659.
75. Craske MG. Transdiagnostic treatment for anxiety and depression. *Depression and anxiety*. 2012; 29(9):749–53. <https://doi.org/10.1002/da.21992> PMID: [22949272](#).
76. Newby JM, McKinnon A, Kuyken W, Gilbody S, Dalgleish T. Systematic review and meta-analysis of transdiagnostic psychological treatments for anxiety and depressive disorders in adulthood. *Clinical psychology review*. 2015; 40:91–110. Epub 2015/06/22. <https://doi.org/10.1016/j.cpr.2015.06.002> PMID: [26094079](#).
77. Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: results from the National Comorbidity Survey. *Archives of general psychiatry*. 1994; 51(1):8–19. PMID: [8279933](#)
78. Keller M. The lifelong course of social anxiety disorder: a clinical perspective. *Acta Psychiatrica Scandinavica*. 2003; 108(s417):85–94.
79. Olfson M, Guardino M, Struening E, Schneier FR, Hellman F, Klein DF. Barriers to the treatment of social anxiety. *American Journal of Psychiatry*. 2000; 157(4):521–7. <https://doi.org/10.1176/appi.ajp.157.4.521> PMID: [10739410](#)
80. Young AS, Klap R, Shoai R, Wells KB. Persistent depression and anxiety in the United States: prevalence and quality of care. *Psychiatric Services*. 2008; 59(12):1391–8. <https://doi.org/10.1176/appi.ps.59.12.1391> PMID: [19033165](#)
81. Sareen J, Jagdeo A, Cox BJ, Clara I, ten Have M, Belik S-L, et al. Perceived barriers to mental health service utilization in the United States, Ontario, and the Netherlands. *Psychiatric services*. 2007; 58(3):357–64. <https://doi.org/10.1176/ps.2007.58.3.357> PMID: [17325109](#)
82. Suedfeld P, Coren S. Perceptual isolation, sensory deprivation, and rest: Moving introductory psychology texts out of the 1950s. *Canadian Psychology/Psychologie canadienne*. 1989; 30(1):17–29.
83. Zubek JP. *Sensory deprivation: Fifteen years of research*: Appleton-Century-Crofts and Fleschner Publishing Company; 1969.
84. Block JJ. Issues for DSM-V: Internet addiction. *American Journal of Psychiatry*. 2008; 165(3):306–7. <https://doi.org/10.1176/appi.ajp.2007.07101556> PMID: [18316427](#)
85. Moeller S. *The World Unplugged: 24 Hours without Media*. Comunicar (English edition). 2012; 20(39):45–52.
86. Wilson TD, Reinhard DA, Westgate EC, Gilbert DT, Ellerbeck N, Hahn C, et al. Just think: The challenges of the disengaged mind. *Science*. 2014; 345(6192):75–7. <https://doi.org/10.1126/science.1250830> PMID: [24994650](#)
87. Van der Kolk BA. *The body keeps the score: Brain, mind, and body in the healing of trauma*: Penguin Books; 2015.

S1 Fig. Floatation-REST immersion time.

Each participant's total float duration (light blue) and total time spent with the lights off (gray).

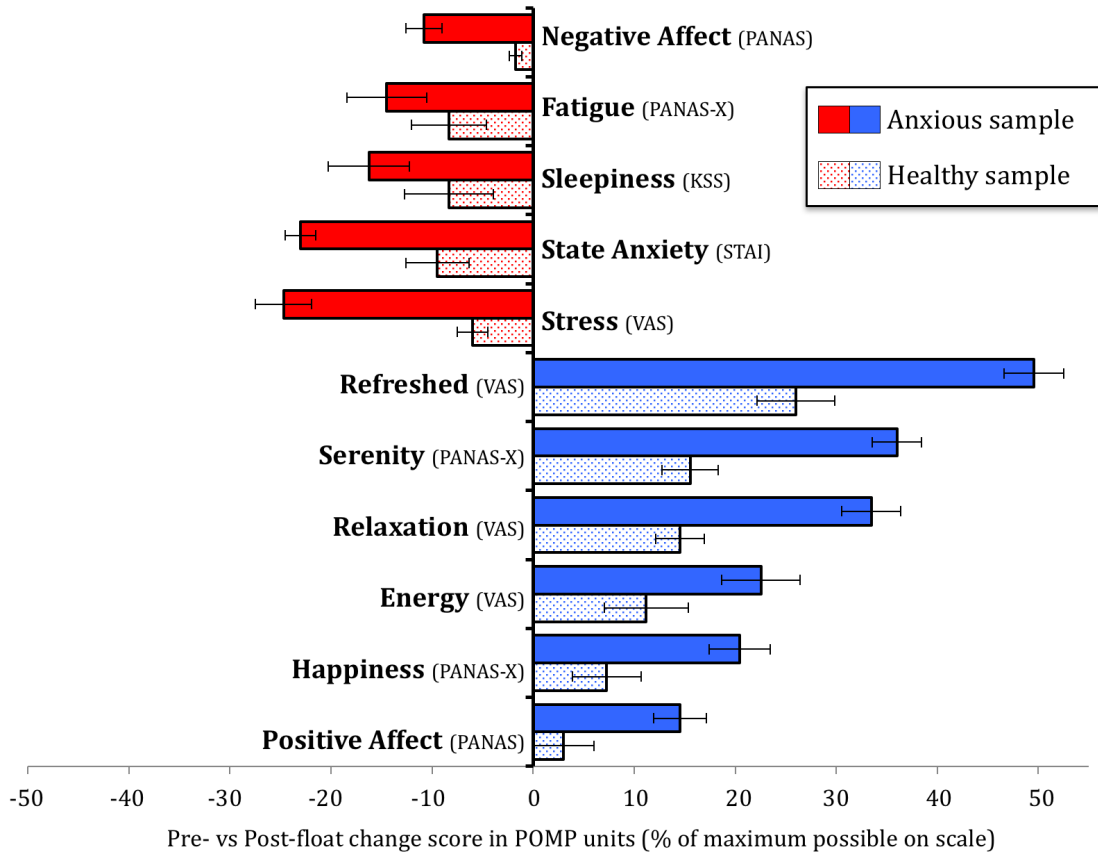
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S2 Fig. Comparison to the non-anxious reference sample.

Change scores from pre- to post-float are shown for all of the measures completed by both the anxious sample and the non-anxious reference sample. Error bars represent the SEM.

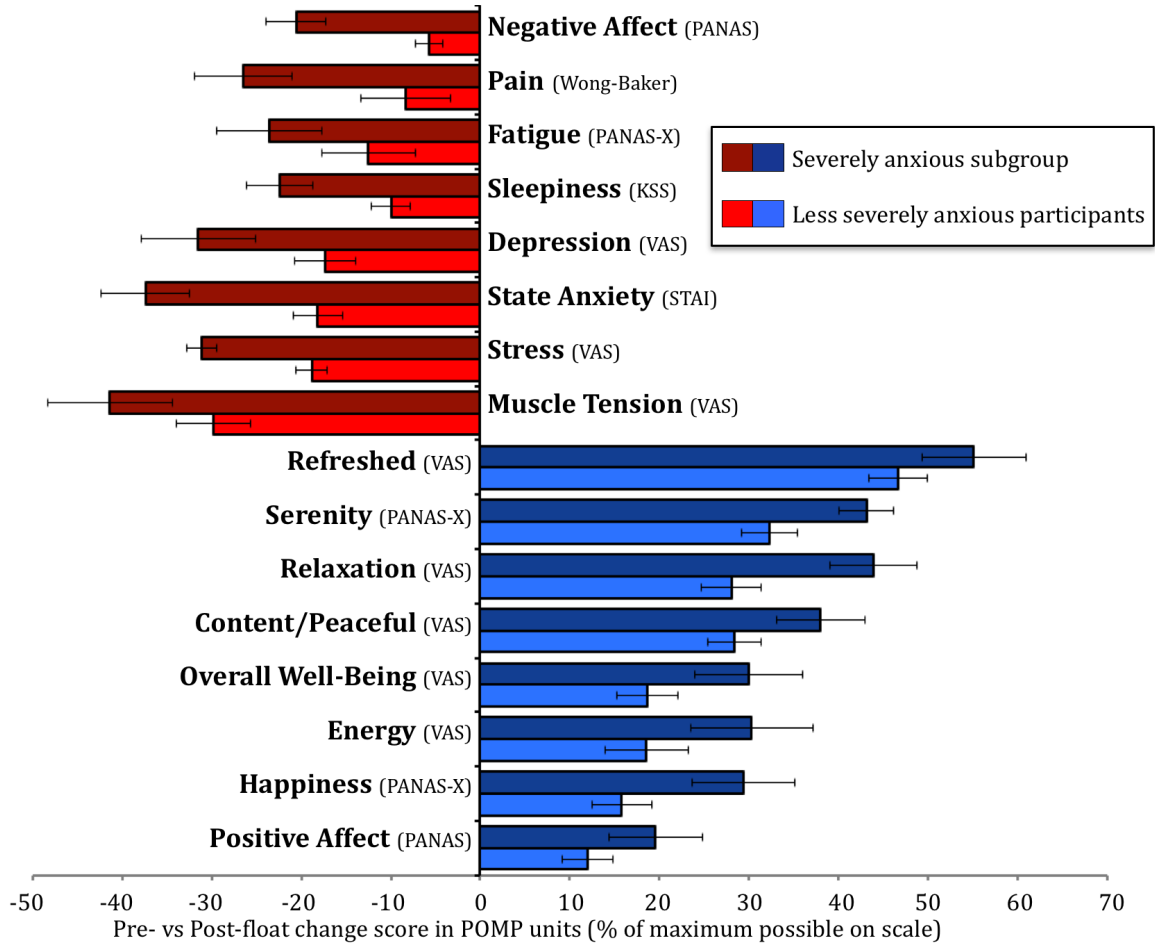
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S4 Fig. Floatation-REST in the severely anxious subgroup.

Average change scores from pre- to post-float in the severely anxious participants (n = 17) in comparison to the remainder of the anxious sample (n = 33). Error bars represent the SEM.

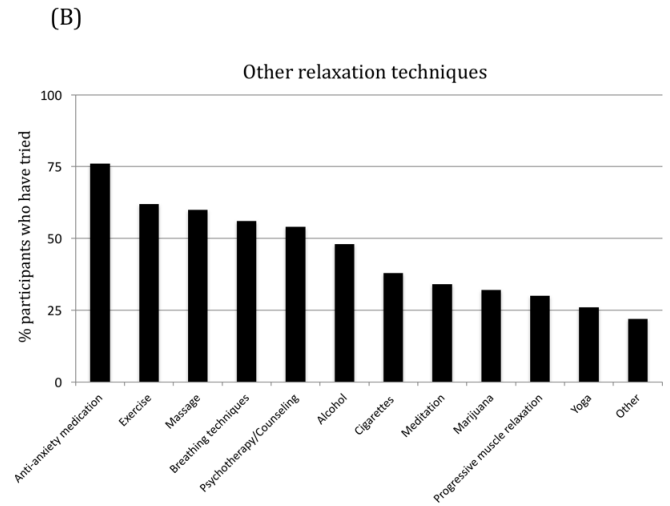
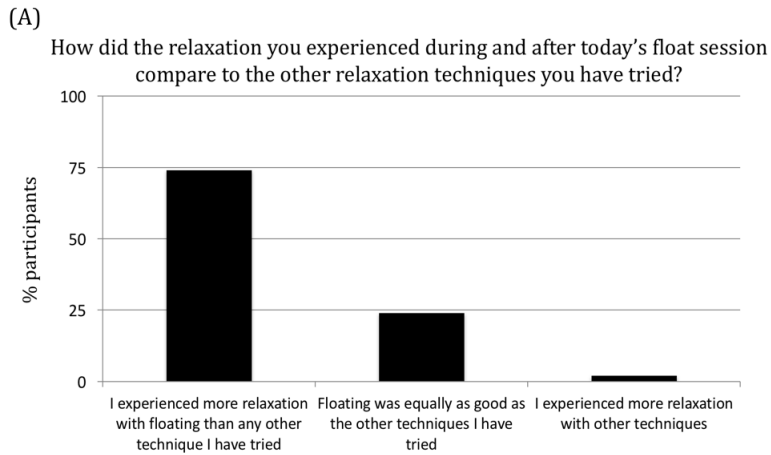
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S5 Fig. Subjective comparison of the relaxation induced by Floatation-REST to other relaxation techniques.

(A) Percentage of participants (out of the group of 50) who selected one of three possible answer choices comparing the relaxation induced by floating to (B) other relaxation techniques they have tried in the past.

<https://doi.org/10.1371/journal.pone.0190292.s007>



Overall, how was your float today?

It was pleasant.

—*Subject 33*

It was nice. It felt good.

—*Subject 20*

Good. It was like calm. [laughs]

—*Subject 35*

It's good. It was really good.

—*Subject 5*

It was good. I liked it.

—*Subject 42*

I enjoyed it. I know some things I'd better do differently next time, if you invite me back. Use the earplugs. I normally don't like anything in my ear; only I think I would use the earplugs. And next time, I won't take a shower before I come in 'cause that was three showers today; one at home, one before, and one after. Next time, I won't take a shower before I come in. Other than that, I just wish I'd been able to stay down longer. I think next time, I'll take my meds before I come in.

—*Subject 24*

It was nice. I mean I wouldn't say it totally took my mind off all my stress, but it helped slow down my thoughts and I got to thinking about them like one at a time instead of just jumbling everything up and getting so stressed out about everything at once I can't change. I was able to like sit there and think on it and—I don't know. I liked it though.

[laughs]

—*Subject 9*

Well I was okay temperature-wise. It was great. I mean, there were times when I had these like out-of-body kind of experiences that it was like [laughs]—okay, closest thing I could explain to you in real life, but I've never had it—like anything like it. Almost like being inside some kind of virtual trip through space kinda thing. It was really cool. And it was weird 'cause like my eyes were closed, or if they were open it was totally dark in there. But it was like these little starburst things with—I don't know—it was really weird. It was very, very cool. And when I finally found what I would consider my most comfortable position—'cause I had a few that were comfortable, but the hands-behind-the-head thing was like, 'Oh man.' When I found that, I just really relaxed. It was like, 'Okay,' I don't know if I fell asleep then, but I was like in the zone there for a while. And then I got times where I was like, 'okay I'm gonna stretch a little bit'—and I found though, that the more I like tried to stretch then I became more fidgety. So if I could stay the way I was before... Plus, it was very good like 'cause I have a lot of times like back and joint stuff; and laying in there, I did not feel any like pain in my joints or anything. And that was really good. I mean there were a lot of different positives. I can see why people wanna do it. It was weird at first, because trying to get used to it and the salt part—sometimes cause like if you turn—do whatever, and the salt gets on you and then it kinda dries up, it becomes a little bit itchy at times. It's not bad. It's nothing like having a rash, but just, you know? It's not painful or anything; it's just slightly itchy in spots. Probably 'cause my skin is really dry from the winter too. That probably doesn't help it. I would advise

Overall, how was your float today?

people, if they were coming in here, for like the week before, moisturize their skin so that their skin's not quite so dry. Even though I didn't get my whole face, you know, at parts, it feels—and my hair feels better. It's really weird.

—*Subject 16*

It was wonderful. Really good. I really, really, really liked it. [deep breath] Yeah, it was great.

—*Subject 30*

Weird, but good. Kind of just like I couldn't really quiet my mind as well as I hoped I would. But overall, it was different than I expected. I didn't think it would be like as pleasant as it was with the temperature being regulated and all that.

—*Subject 40*

It was great! It was wonderful. It was kind of like taking Klonopin or Xanax without the side effects; just feeling like alert—not that fogginess, you know, feeling sluggish or just like I just wanna withdraw. It was just great. Yeah! Yeah it was, yeah. Unlike anything I've ever felt. So it was good.

—*Subject 2*

Oh it was awesome! I feel so relaxed and I just loved it. It was so awesome! I think I may even have fallen asleep. I don't know.

[laughs] It was awesome. It really was. I've never been so relaxed. I felt a little tension, like you said, in there before, but I just let go—just let it go! And it was ugh! Awesome. I'm so amazed by how my body's feeling still! It's lasting too—longer than—I got a massage one time and I've never felt so

relaxed. This blows it away! I mean I feel so relaxed. I mean my mind is still just like, 'Hey, it's so relaxing.' You know, I don't know how to explain it any other way. It's just my whole body and my mind—I feel so good right now. I'm not in pain. My knees usually some, and my back usually hurts. I don't feel anything right now. I don't feel any pain or anything—nothing. I mean, I feel I've never been this relaxed. I feel so awesome. I really do! It's better than a pain pill. It's better—oh my g—I can't believe it! It really—it's freaking me out how good I feel. I really do. I do—I feel so... I mean, somebody could come in here and [laughs] jump on me and I wouldn't get mad. I wouldn't—I would not get mad. I'd be like, 'Go ahead!' [laughs]

—*Subject 38*

It was pretty good. I liked it.

—*Subject 10*

It was fairly relaxing, but I don't know if that neck tension makes sense for other people. I mean I put my hands behind my head a couple times if when I thought it was starting to get a little tense, but then I took 'em back off there and relaxed again so.

—*Subject 43*

It was pretty good. I thought it was mainly gonna go—like felt good at first, and then like get boring, then feel like I would have to like kinda like push myself to like stay there. But I think it was nice at first but kind of and then it did, like for a little while in the middle there, it was kinda just—you were kinda trying to like—it felt like you were trying to push through it or force yourself to relax a little bit

Overall, how was your float today?

more, but then like once you kinda just kinda pushed through that, it kinda gets like—then you just chill. [laughs] Yeah it does, but once you—I got to that point, it felt—it was pretty good.

—*Subject 4*

It was amazing. It was like floating on air. No cares in the world. No worries.

—*Subject 14*

Very relaxing.

—*Subject 37*

The last 15 minutes I think were good, but the—the first half was unexpectedly anxiety-inducing. Like when I was taking a shower, it was fine; but when I first got in, like the panic set in and I had a hard time making it go away. My heart was racing. I felt a little bit tense. [Experimenter: How long do you feel like that sensation of panic lasted?] About 20 minutes and then it subsided after that. But I had to put some effort into calming down. I tried to figure out what it was—like, ‘Was it just the floating or the light or the size of the room?’ But I felt like if the size of the room or the pool were bigger, I’d have even more anxiety; or if it was darker—like I didn’t turn the light off at all. The blue one, I didn’t turn it off. I think one of my fears was that when I was floating, I kept splashing around and trying to control my environment because I didn’t want to let go; I didn’t wanna slip into the feeling you get when you’re in sensory deprivation. Like I meditate and I enjoy that, but I can always move my arms and wake up and go do other things around my house. I think this was a little bit different. But when I was finally—like in the last 10... 15... 20

minutes, when I was finally enjoying the float, that felt very much like I was meditating.

—*Subject 22*

It was pretty good. Very calming and soothing. Good.

—*Subject 31*

Very relaxing. I mean really relaxing. I did do some breathing because with the earplugs, it’s easier to pay attention to one’s breathing and my heartbeat. I could feel my heartbeat in my ears, which is weird. But then I would drift off to sleep, and then I’d twitch. [laughs] You know? ‘Cause every time I—you know. But so, you know, I did use some of the time to do some jewelry designing and, you know, that sort of thing; but then my mind just sort of drifted off and then I’d fall asleep and then I’d twitch and then I’d wake up and then I’d... [laughs] and then I’d breathe and then I’d, you know, drift off, twitch, wake up... [laughs] But like one of the questions in the survey was like, ‘How do you feel right now?’ and I’m kinda like man I’m just kinda like I either just had an hour-and-a-half massage—not the hour! The hour-and-a-half massage; or I had a really nice nap. ‘Cause I’m just—I’m not foggy. I’m pretty neutral, but I’m really relaxed, you know? I was gonna write in there, ‘like butta,’ [laughs] but then I thought, ‘No.’ [laughs] I normally don’t, but it was saying like ‘describe’ and I was like, ‘I feel like butta!’ [laughs] But that’s pretty much, you know, very comfortable; the water temperature was perfect. What did you put it at? Do you know? [Experimenter: It ended up going closer to 95.] Okay, that’s fine. That’s perfect. And the water—you try

Overall, how was your float today?

to keep your water heated at the same temperature. And so yeah. So that was perfect. I mean there was times where I couldn't tell the difference between the water and not the water. So then, if I felt even just a touch warm, I'd just push off from the side and then the water would slightly cool. And then I'm like 'Ah, go back to sleep.' [laughs] So that thing's great. Seriously, you oughta hire it out! [laughs] I mean cause the break from the external stimuli is necessary; and I think that's what meditation is trying to achieve. When you've got all this crap going on around you, well stick 'em in a float pool! I ended up not turning the light off, but it didn't make a difference to me, you know? Because I kept my eyes shut just in case, when I twitched then I'd get—you know, well, you know what I mean. But it wasn't a light that would bother me at all, you know? So just no big thing.

—*Subject 29*

It was really good. I actually thought I was pretty relaxed before I went in, but when I got out, I'm like, 'That was pretty amazing.' It's really weird. I don't know. I have had a similar feeling like when they give me like conscious sedation or something when I'm first like—I feel like everything is gonna like cramp up. And I have to like really concentrate on relaxing so that it... so I guess I must have a lot more tension than I think. [laughs] [Experimenter: It gets built up. And the brain has a way of sort of holding on to it.] Yeah! I could—well that's a thing I could really feel in there. But I think I was able to get there. And I could feel the back and neck tension and everything, but I think I resolved that pretty quickly. [laughs] I just had to

remember to like let my head hang. [laughs] Well I did get relaxed enough that I think the right side of my head is heavier 'cause I'm kinda goin like this and I actually did get some in my eye just because I like... It was fine though. It wasn't a big deal so. I think that was the only thing, at the time, I did.

—*Subject 36*

Incredible! [laughs] I would recommend it. I mean I've never had chronic pain, but if people maybe have chronic pain, I mean there's like a weightlessness feeling. I mean, I just 'incredible' is the only word I can think of. I kinda did something a little bit that, to me, was euphoric; as I was laying there, of course, I figured out the light finally. Round peg, square hole. When I was laying there, like you know, just like this, if I bumped the pool, I'd kinda just ever so slightly just push myself off and I could feel like my hair, you know? And so I mean it just felt like I was just bobbing in the calm ocean. I mean I kinda liked the—cause like I told you, I'm still in the very beginning stages of meditation; and so to me, that freed my mind—was just laying there and just kind of ever so slightly pushing off and then I'd just... Yeah I had no idea where I was and then, 'ope, here's a wall!' and just pushed away from that. That was very therapeutic! I'm like I don't know if anybody's tried that, but... [laughs]

—*Subject 1*

It was really good. I really enjoyed it. I could go back in there for another two more hours. The time went by fast a little.

—*Subject 44*

Overall, how was your float today?

It was really good! A lot of it, towards the beginning, I was having a really hard time settling down. And I knew like as soon as you had said some people have issues with, you know, their neck having tension; I knew I was gonna be one of those 'cause for some reason that's always what I go to. And I was like 'okay.' So I was prepared for it. Ready to try to relax. And I felt like I did for a while, but then for some reason, I felt like my neck was getting tight still, and so I was like, 'Well maybe if I just, you know, try to move around or, you know, maybe it's just, you know feeling creaky for being in the same spot.' I don't know; and um so that was the only issue I really had while floating, but it was pretty good for the most part.

—Subject 13

It was good. I enjoyed it. It was relaxing so...

—Subject 12

It was pretty good. I got kinda bored, I think, the last probably 20 minutes. Besides that, it was okay.

—Subject 47

It was wonderful.

—Subject 3

It was good. [laughs] I had a lot of like anxious thoughts and worries like constantly. And I had to constantly remind myself to calm down and relax. It was difficult at first, and then like I kind of just relaxed; and then like I felt like I lost track of time and I was like, 'Well, how long have I been in here? I feel like I've been in here a long time.' And then I got like—I started to get really worried and really like irritated and I was just like, [deep breath] 'Okay...' But throughout like

the whole time, I had to keep turning the light on and off because it would become like kind of a nuisance. Like too bright. But then, I would really worry about like not having a light on. I couldn't see my surroundings. I lost track of my position in the water. It freaked me out. And I had to like touch the—I had to put my feet on the floor a few times so that I could like ground myself so I knew where I was. I had to keep doing that. I had to sit up a few times and get water out of my ears so I could hear. I got really anxious I guess!

[laughs] [Experimenter: How did your neck feel?] I had to keep moving it. Like it stiffens and like builds up the cartilage; like builds up the pressure if I stay still for too long. So I have to move it to pop it. And that happens in my shoulder too 'cause there's some tension points behind my shoulder blade that are also tense nonstop. So I had to keep moving my arm up and down. I was really restless. I'm that way normally anyways though. I move around a lot. I did have moments where it was really enjoyable. I liked being able to stretch out and not have the pressure of like pillows or a mattress or a chair on me. That felt really nice. [laughs]

—Subject 7

It was different. It was relaxing.

—Subject 8

It was good. I enjoyed it.

—Subject 10

It was good. You know, it took maybe a minute or two to kind of get acclimated to the feeling of it. And then I kinda tested the light being off and on a couple of times and I think I ended up just leaving the blue light on. And then I tried, you know, leaving my eyes open

Overall, how was your float today?

and closing them—just kinda testing everything but, overall, it felt good. I didn't really feel any neck tension or anything. But I could see kind of like when I tilted head up, where—but I was able to kinda get in a real comfortable position and just tried to kinda relax.

—*Subject 17*

It was a really nice experience. At first, I noticed the neck tension you were talking about. I'd realize it was tense and so I'd try to relax and then I'd find myself like holding my head up again and I'd have to relax. After a while, I was able to—it felt like I was kinda completely relaxed. I would be fine like and just laying there and then I would get kinda restless in a way. I feel like that's just cause I'm constantly used to—going, going, going. I don't usually take time to like waste time, you know? [Experimenter: And just to have a moment to yourself is kind of unusual?] Exactly, yeah! So I was kind of like—my body just felt restless, and I was kinda thinking about, 'Well, what do I need to do?' Like this and that. But overall, it was really nice.

—*Subject 18*

It was different! I didn't really know what to expect going in there; but you know, once I was able to kind of relax into the water, it was kinda difficult to determine—especially if you don't move—kind of, you know, where the water stops and where you are. And so it does have kinda that—I don't know if 'detached' is the right word, but you do kinda have just that feeling of, you know, you're not quite sure where your position is in space. But it's not a feeling of fear. I mean it feels very secure. So I floated a little while with the light on and I

thought that was fine cause it was so dim. And then I tried it with the light off for a little while. And I think, personally, I did a little better with the light on. It's simply because with the light off, I just found it—you know, mind was kind of looking for something to focus on a lot. And to the point of okay well I'm like, 'I think I need to move around a little bit.' It was very difficult to stay still for an extended period of time with the light off; so I would turn it back on and it was easier. I found it was easier for me. And so after I had the light back on for a little bit, I decided to try a little bit more with the light off. So I did. And it was easier the second time around, but still found myself kind of restless. And so I felt like it was more relaxing for me with the light on.

—*Subject 19*

It was really good. Strange. I would describe it as strange. At some point, I lost physical sensation and that like—at first, it was really, really odd; and then I kinda just accepted it because there was no reason not to, I guess. I don't know. And then I was—I'm not sure I was asleep. I don't know if I was asleep, but it was like time went by really fast and the thoughts—any thoughts I was having were dreamlike. And so it was really interesting in that regard. But I have never had like—I mean there were moments where like I was very aware that I could not feel my extremities and I couldn't feel anything. And it was like—I don't remember. Other than maybe being under anesthetic or something before like a procedure; maybe before like dental. I don't know. It was like you were completely un—unplugged or removed; I would use the word 'removed,' 'cause I don't

Overall, how was your float today?

know how else to—that's kind of a—yeah, so yeah! And then, like whenever I got out of the tank, I was doing everything, getting dried off and everything; my mind was clear and I knew I had to take a shower and dry off and get it all, you know; and so I went through those motions like I normally would and then, like the whole time, I'm realizing like I'm still like not a hundred percent feeling like—well I say 'feeling'—I guess the word is 'feeling.' But it's not that I was in pain before, but it's like there was even less pain; like or there was even less tension—I don't even know the word! Because I wasn't in pain before I went in there; but then, whenever I came out, it was like this gradual transition to I would say—this is a good way to put it—like at one point, I went numb in there and then slowly, the numbness wore off and it's still wearing off. But it's like it's still there in a way. It's a very strange thing. This is the first time I've ever felt anything like that that wasn't involving like medicine or something, you know? So it was very, very odd, but nice and I would say also—and I put it in that—in the questionnaire; for some reason, I felt appreciation because I was in such a pleasant state. It was interesting too.

—AO035

It was good. It was good. It was very relaxing. I think I may have fallen asleep a little bit, it was a little bit harder to quiet my mind. I was thinking about what I have to get done next and today and what's going on, whereas usually it's afterwards. It's after I've already—I've gotten pretty good at not worrying about tomorrow. It's what's next in the day. So I did find myself going back and trying to return to my breath because I noticed

that I was really gnawing on the afternoon and what I had to get done. And I think, for me, it's not a get-ready-for-the-day activity; it's an unwind-from—wind-down kind of activity.

—AM244

It was very relaxing. It felt safe. It didn't feel—I mean not having anybody else in the room was nice. It felt very private and secure. And being weightless was kinda nice.

—Subject 21

It was very nice!

—Subject 27

I actually really enjoyed it! I decided to not do clothes. I figured if we're doing it, we're doing it. It didn't seem to matter. At first, of course, my face itched everywhere, you know? Not touch it, so it itches. I initially was there and eventually decided to turn out the light; which I don't know if was necessarily a good thing because then it was much easier to kinda clear my thoughts without everything to distract and be able to focus on... I may have nodded off for like a second or just like started—I don't know if I started to fall asleep and jolted awake. I would guess somewhere like 20-40 minutes time frame to get relaxed. I think I finally found the sweet spot to not hold my head up. But it was really nice. I mean once it was dark, yes, of course you want to go to sleep because that's the only time you are still in the dark.

—Subject 28

Good!

—Subject 34

Overall, how was your float today?

It was awesome! I really liked it.

—*Subject 39*

It was actually amazing. I was, like I said earlier, a little nervous about it, but it was really amazing! I was really surprised. And yes, there was no way that I couldn't have floated! [laughs] Like I did, I felt like a little [inaudible word] picture. It was awesome.

—*Subject 45*

It was a very pleasant experience; to the point that I would want to have one of those in my house. I really, really liked it. What I wrote in the questionnaire, or the survey, is that what I like about it is that it's so natural. And so I was kinda concerned about the floating 'cause I kinda was a little nervous about that, but I was amazed at how quickly my body just rose to the top of the water like I would even lift my leg up at one point, but my head was still above water and I thought that was really cool. But I was just wanting to test it out to see what would happen [laughs] But yeah, I did what you were saying to do as far as like moving my head around to try to relax my neck and one thing that I noticed is that my head felt really heavy and it was almost like a blood-rushing-to-my-head type of experience. It didn't last very long. Probably maybe five minutes or so. And I even put my hands behind my head too—and towards like the very end—I'm not sure how long I was asleep, but I did fall asleep. And I think I like the lights off too, because I noticed I had my eyes open whenever the lights were off and then I had my eyes closed and it just kinda seemed like there was no difference whether or not... And so I felt like it helped me to really focus and just kinda—I was really

trying to use the opportunity to just let go of a lot of stress... But it was, overall, a great experience. I definitely would do it again.

—*Subject 46*

I really enjoyed it.

—*Subject 48*

It was great! Very relaxing. And I wasn't really aware of the water at a certain point and it was really nice.

—*Subject 49*

Perfect. [laughs]

—*Subject 50*

What did you think about, if anything, while you were floating?

Oh, jeez. Everything and anything; planting my garden, talking to God, thinking about my kids. Yeah, just mostly thinking about [how] I could hear myself breathing.

—*Subject 33*

I tried to just practice thinking about my breaths. I learned a cyclic breathing like in through your nose, out through your mouth. So I tried to do that the whole time.

—*Subject 20*

[laughs] Just absolutely nothing.

—*Subject 35*

The first part, it was fairly easy to keep my mind fairly clear, but as time progressed, it was hard to quiet the chatter and stuff like that. [Experimenter: In terms of the chatter, would you rate it as more positive thoughts or memories or more negative?] It was just more tasks of what needs to happen today. And more stresses of what the rest of my day looks like after I leave. And things like that.

[Experimenter: How did you cope with those sorts of thoughts inside the pool? Was it different than having those thoughts outside the pool?] You know, I kept trying to let my mind go and then bring it back to quiet it down, but after so long, I just sort of fell into it and started out, ‘Yeah I need to do this, I need to do this. This is expected to happen.’ And all that sort of stuff too.

—*Subject 5*

Just like past memories of like my dad and going to see my new nephew and everything. [Experimenter: What was it like to experience the memories in that environment?

Was it different than having them out here?] Oh yeah, yeah. [laughs] It was a lot different. It was kinda of like just being there and I guess that would be the best way to put it. [Experimenter: These are old memories of your father and stuff?] Yeah. [Experimenter: Were they positive or negative?] Positive.

—*Subject 42*

Everything was going very slow. Even the thoughts. Everything just slowed way down and it was kinda like, ‘Oh, let me get through this! This pain is gonna get me!’ [laughs] The pain in my shoulders is always there. And my neck ‘cause there is nerve damage in them, but other than that...

—*Subject 24*

Mostly like the stress with our little house fire and stuff. And losing the kids after that. But it wasn’t like unbearable like how it is every other day when I’m thinking about it. It was—I don’t know—like I could think about it without getting depressed or feeling like I wanna just take a shot or pop some pills.

—*Subject 9*

Oh just the crap from today mainly. And my work. I’ve had a lot of stuff going on with my work; trying to decide what I wanna do next year. And right now I’m teaching and coaching. I’ve been trying to decide whether, now that I’m here, whether that’s something I wanna do. Our school’s trying to—there’s just lots of change—stuff that’s going on, and it’s been going on a lot in the past probably

What did you think about, if anything, while you were floating?

month or so, because in education, this is the time of the year it starts, you know—till you figure out what you're gonna do next year and I don't know. And then today, my principal got up and said about that thing, and so it's just kinda—it's just kind of re-stirred all of that stuff and it brings about a little anxiety. [Experimenter: What was it like to experience those thoughts in the pool versus out here?] I would say that I didn't—my body didn't probably get as tense because it was like forcing my body to relax even though my mind was going, because when I do it like out here, your body has these normal reflexes that, you know, the neck and the shoulders and different... And another thing I do a lot is I grit my teeth and I do all that stuff; and I noticed in there I wasn't doing that as much. It's kind of like, like I said, almost like putting your body in a tranquil state while the mind is still working. [Experimenter: It's a very interesting juxtaposition between those—] Yes! Versus the fight of the environment. There, you're not fighting that environment. And because there're so many distractions all around you, whether it's noise, or visual, or auditory. And in there, there's not that. So I think that's where sometimes clarity and things like that can be from.

—*Subject 16*

I did think a lot about my bike. And just the road. And a student, random client [Experimenter: So no real negative thoughts or anything?] No. They were all really positive thoughts, you know? Or good memories; like how the questionnaire said. Nothing really negative. Nothing uncomfortable. Just the queasiness was the only uncomfortable feeling.

—*Subject 30*

Anxiety that I've been kind of focused on today, specifically, and stuff I need to do when I'm home. That's pretty much it.

[Experimenter: Did those thoughts feel any different in the pool than if you had them in day-to-day life?] they came a little bit clearer, 'cause I—my mind was able to focus on them specifically and not like, you know, thinking about work things as well as that being in the back of my mind. They were more in the like forefront of my mind. [Experimenter: Did you have any difficulty coping with those thoughts?] Not any more than normal.

—*Subject 40*

Letting go. I kept thinking about... just I felt so grateful. Grateful for the experience. Grateful for just how wonderful it felt. Grateful for just... it's kind of like life happens here, and you can just go through a door and not take part in it. You know what I mean? Just separate yourself from life for just a little while, you know, just pausing. Kind of like, you know, like in movies, like you press the pause button and you move and everybody else... like life just stands still. Like that. It just felt like life stood still. I remember feeling grateful. And the letting go part was more of—I would just keep sensing my body while I was breathing, trying to feel where I was holding on to tension. And you don't realize it because you relax and then you concentrate on your feet and you go and you tell your feet to relax. And you can feel, 'Okay it's relaxing a little more than I relaxed before.' So I kept doing that. And every time, I just was able to relax more and more. So that was good... And at one point, I felt like I wanted to move, just slowly, from side to

What did you think about, if anything, while you were floating?

side. Just like, especially when the music came back on, it felt like I just wanted to—I felt happy! [laughs] [Experimenter: Did you have any negative thoughts or memories during the float?] No. I was just—I felt totally present. I didn't think about—deliberately, did not want to think about anything else. It was a gift to me, so I wanted to use it while I was there.

—*Subject 2*

Honestly, I was just trying to relax. My main concern was I was trying to relax. Just let go. Relax. That's what I was trying to do.

—*Subject 38*

Thought about my day for little bit, at first. But then, eventually, just kinda tried not to think about anything. [Experimenter: Did any negative thoughts or memories come up?] No.

—*Subject 10*

Oh, I put it on a deal. Probably like thoughts about the future. Thoughts about spiritual stuff. I mean it was pretty—not really focused on the present or worrying about present stuff; just kind of wondering about the future and, you know, like I said, spirituality type stuff kinda played in. [Experimenter: Was there anything different about having those thoughts while you were floating in the pool versus having them out here?] I don't know. Maybe I didn't dissect them as much. I probably just like opened myself up to something to come to me and then just was at peace with it after that, as opposed to trying to break it down. Like if I was sitting at home, you know, in the daylight or something, or just with the lights on—TV on or something like that, I might sit there and kinda dwell on

it and try to break it down more. But while I was floating and feeling calmer, I was just opening myself up, waiting for something to kinda come to me or wishing for it to come to me. Kinda something like that. I think about that off and on throughout, you know, every day. I think about spiritual type stuff; though I mean just not your run-of-the-mill regular, I don't know, traditional religion type stuff. Just I don't consider myself a religious person, but I consider myself a spiritual person. You seem like a pretty intelligent guy though. I don't need to explain that to you. Religion sucks and spirituality is awesome. I think because religions start wars.

—*Subject 16*

I mean not really in particular. I felt pretty present. I don't know. I wasn't—I mean like there's like a couple like thoughts from past or like worrying about the future, but like not very much. Like they were just kinda brief and they would just kinda pass by.

—*Subject 4*

At first, my mind was just kind of like everywhere, but once I calmed down and just let the water take over, I didn't think about anything. [Experimenter: Did any negative thoughts come up during the float?] No.

—*Subject 14*

I thought I was in the ocean. [laughs] I thought about all that peaceful stuff. I didn't have any tension in my neck, where I had to do that. It just came automatically.

—*Subject 37*

What did you think about, if anything, while you were floating?

In the first twenty minutes, when I was very anxious, I was trying to figure out why I was scared of my environment. So I was trying to imagine like—or figure out exactly what I was afraid of. So I was going through possible scenarios in which it could end poorly to try to figure out which one was bothering me. So things like that, at first. But then, towards the end, I was trying to—when I was trying to calm down, I was thinking of things that calmed me down. [Experimenter: When you were having those anxious thoughts, inside maybe during the first part of the float, did those anxious thoughts feel any different than having the thoughts outside the pool, or was it kinda the same?] It was very different. I'm not normally an anxious person of my environment. [Experimenter: So it really was kind of learning to feel safe in this new environment?] Yes.

—*Subject 22*

I had some mind chatter going on, but I couldn't really—I wasn't, you know, not any specific thoughts.

—*Subject 6*

How much everything is going to be uncomfortable when I leave that room. I'm serious! It's, you know, a flood of sensitivity and just all this other stuff. And it's like somebody is putting a wet blanket over you all the time. And just, you know, and just kind of feeling like how sore my muscles are. And, you know, there was a point where, when I was floating, I lifted my arms up and I had this opportunity to feel how much difficulty I was having with my strength; and so, you know, that was kind of discouraging. But I used to swim every night; and so I think this

is actually going to prompt me to go get [laughs] a membership for swimming again. And it gives it an opportunity to work all the muscles at once. But it was just a relief.

—*Subject 11*

It's just like—I don't know. It's hard to say. I mean I guess you're there, but, you know, you kinda just feel like you're not, you know? I guess you're just kinda lost in the moment. I mean, it was nice. It was very calming.

[Experimenter: You weren't necessarily thinking about past things or future things?]

Not really.

—*Subject 31*

You know how when you're falling asleep, just random thoughts go through? And I don't even remember them. I don't—yeah. Just random stuff, and then random thoughts, 'blah blah blah,' twitch! [laughs] Jewelry design, random thoughts, 'blah blah blah.' Twitch! So...

—*Subject 29*

For a while, I wasn't thinking about anything. And then, when I was thinking, it was actually pretty good. Just like envisioning things that I wanna see. So it was pretty positive.

—*Subject 36*

[laughs] Just that I'm not used to going for long periods of time without communicating with my husband. So that was kind of a little bothersome, but he's a big boy. He can take care of himself. That was probably the only thing I really thought about, was, you know, I hope he doesn't need me for something.

—*Subject 1*

What did you think about, if anything, while you were floating?

Nothing really. I did fall asleep a little bit. I was relaxed and I was just thinking...

—*Subject 44*

A lot of what I was thinking about was kinda the future of like, oh, things I need to do this week. None of them were really positive or negative thoughts. A lot of them were more just neutral. Almost kind of like a time to gather my thoughts 'cause a lot of the time, I'm typically more scatterbrained. And while I normally remember to do everything, it's always in a weird order; or, you know, I'm in the middle of doing something that needs to be done and I'm like 'Oh shoot! I have this, this, and this that I need to—' you know? [laughs] This was kinda nice cause it almost gave me a chance to kinda plan out what I'm supposed to be doing this week. [laughs] And I don't know if that's what it was supposed to do, but it helped me in that way at least!

—*Subject 13*

It started off with, you know, just kind of the normal thoughts that I have. Just, you know, 'What's going on at work?', 'What's going on at home?', 'What do I need to do when I get there?' And then, as I kinda got relaxed into it, I was able to kinda push those out and kinda really just focus on just being there and it was really kinda weird cause like when I got to that point where it was really easy to keep those outta there, I started getting like a light was like a halo effect kinda. It was like wrapping itself around my head and it was kinda narrowing as it went along. And so like just kind of imagine, as one of those thoughts would come in, I would just imagine it going [laughs] into the center of that.

[Experimenter: Had you ever experienced

anything like that before?] I hadn't, hm-mm. So it was kinda strange at first; it was like 'Eh!' [laughs] [Experimenter: And it lasted a while?] It did. Yeah. And I was able to like—I stopped—I think I coughed halfway through; or I don't know—it felt like halfway through. And it kinda knocked it out, and I was able to get it back. And so that was kinda cool. So I was actually kinda disappointed 'cause I was like, 'Oh, it's kinda fun to watch.' It was like a really slow strobe light. So yeah. So mm-hm, weird.

—*Subject 12*

I just thought about like my vegetable garden. [laughs] Like, 'What am I gonna put in my vegetable garden?' But I tried to keep it positive whatever I was thinking 'cause I know I can't stop myself from thinking. You know, I tried so at least I thought, you know, I'd make it positive, you know? Yeah, I didn't have any negative thoughts so that was good.

—*Subject 47*

I did have swirling thoughts. It's not like I went complete still-of-mind, but it wasn't negative and it wasn't intense or chattery. Very relaxed. And that's not very norm for me so.

—*Subject 3*

I had to keep reminding myself to calm down; and like grounding myself. And then I would worry about like things I had to do, and school, and summer classes, and babysitting, and my sister's moving, my friends... [laughs] [Experimenter: What was it like having the mind chatter while you were floating versus say having it out here in the normal world?] It was like the same thoughts

What did you think about, if anything, while you were floating?

that I have, they were just kind of like further away; like hazier whenever I was floating.

And I didn't really have anything to distract myself, which was really irritating.

[Experimenter: So you're used to having the thoughts, but then you can move to something else and thoughts can be temporarily moved away?] Yeah. But they were still kind of like hazy 'cause I knew they weren't supposed to be something I was thinking about I guess. I'm not really sure. They just, I don't know, felt hazy. [laughs]

—Subject 7

I don't know. Just the normal, I guess, stresses. And then, I don't know. I think, at one point, like I just kind of felt one—I don't know. Almost like—I don't know—I kinda kept thinking, you know, that maybe this is what it feels like to be in utero, you know? Like I don't know. I don't know. But it was a bit challenging to try to let go of current and, you know, like later and tomorrow and just kinda be in the moment. [Experimenter: Did it feel the same having the thoughts while you were floating versus out here?] I think like physically, I don't think my body was taking as much of a hit as it normally would; because with my stress and anxiety, my body is, you know—I exert the physical signs and symptoms. So I think in there, my mind might've been kinda stressing a little bit, but my body was definitely not taking a hit. It wasn't holding it.

—Subject 8

I mean I tried to think about my breathing more once I got used to, you know, floating. And so for a couple minutes, I mean, maybe five minutes of just sort of getting oriented to,

you know, like actually floating, after that, a lot of it was trying to like let some of that tension out. Like I know, especially like in my shoulders, in my neck, in my jaw; 'cause I feel like those are kinda places that when I'm trying to go to sleep at night like that, I have to be cognizant of not, you know, to not like just let them remain tense. Especially like in my jaw because, you know, I think sometimes you just kinda sorta start breathing and you're listening to that. And for me, sometimes I don't think about how much my jaw's clenched. You know, I still also thought a lot about like current things like anxieties and worries, you know? So there were still some like rapid thinking like kinda running of thoughts. But they didn't, you know, they didn't seem as like alarming. They were still, you know, there in my mind. And I still thought about them, but it didn't seem quite as immediate as they normally do.

—Subject 15

I was able to kinda just zone out and just kind of relax. But occasionally, I would think about like, you know, 'What am I gonna do later today?' Or, you know, about maybe something I heard on the radio on the drive over. Just really benign stuff like that.

—Subject 17

That was basically it. Just kind of—I was like kind of playing with the water; like moving and stuff. And then it felt cool 'cause my hair was like moving effortlessly. But that's really all I remember. And the rest of it was pretty just calm and still. And I think I fell asleep towards the end.

—Subject 18

What did you think about, if anything, while you were floating?

[laughs] It sounds goofy... But, you know, we started out without music. And so initially, I was just kinda thinking about, you know, consciously trying to relax every single little muscle. And then, once I felt like I had kinda that piece of it down, went ahead and had the lights turned off. And what I found myself kind of [laughs] imagining, once I kinda got comfortable, was, you know, 'I wonder if this would be similar to what maybe astronauts feel.' Because of kinda that weightlessness and not really having an up or a down or, you know, you're just kind of suspended in space and, you know, if you could pass safely through space comfortably and safely, it might feel like this. You know, and if you were gonna do that, what would you see? You know? So it was kinda like imagining, you know, some of these photographs from the Cassini being sent back. And you know, it was just—I found that to be kind of neat; stimulating on a very low-key level. So you know, memories I had of maybe different times I've had massages done and, 'Okay, how does this compare to that?' And I found, oddly, that I would get distracted from thinking just by my own heartbeat and breathing. [laughs]

—Subject 19

It was thoughts—okay so at the beginning, before I got comfortable, it was just like, 'This is really nice. This is really interesting.' Kind of just fascinated by it all. But then, whenever I actually like got still—then I don't think I fell asleep. See, that's the thing is I don't think I fell asleep, but I might have. And the thoughts I was having turned into dreamlike thoughts. So I think I was having

[laughs] dreamlike thoughts, but not actually asleep. That's how I would describe it.

—Subject 21

[no response]

—Subject 23

Well at first, I was trying to get my body to where I could relax. And then, my brain kept going to, 'What are you gonna cook for dinner?' And I'm like, 'No, don't think of that!' [laughs] Try to focus on like a what piece of paper. And I would just try to not think of anything. And then, I'd find myself jerking a muscle and waking up. Then I'd try to think of the beach. Something relaxing with water. Floating in the water.

[Experimenter: So no negative thoughts during the float?] No.

—Subject 26

[laughs] As I put in the little form thing too, a lot of it was trying to get out of the thought patterns, which I normally have. Which you're trying to achieve stillness. So mostly, it was day-to-day stuff that kept popping into my head as far as, you know, work. It was like, 'Okay, I gotta do this tomorrow. And you know, over the weekend, I'm gonna do this.' And there's a whole bunch of, 'Okay, stop thinking! You're supposed to be still.' And then, also switching into, 'Okay concentrate on your breathing.' Basically reminding myself to try for the stillness or whatever. 'Okay, concentrate on your heartbeat instead. Okay, I wish I could turn off the music that's starting 'cause this really sucks.' [laughs] Just at the very start, because it did turn off; which was great, because I had splashed a little bit because I was looking for

What did you think about, if anything, while you were floating?

a button to turn off the music. That's just me though!

—*Subject 27*

Initially, a lot of kinda the thoughts when you're falling asleep at night. Some recent bad news and kinda comparing it to slightly further back losses and some of those things. Some of the pragmatic task-oriented to-do list things. Then, eventually, able to kind of at least, one, be able to look at it a little bit differently, but then be able to kinda tuck it away. [Experimenter: How did you cope with these memories?] [sighs] I've kind of learned to accept; to just own them. They're not going to not be there. And just kind of like greet them and be like, "Yeah! There we are!" And move from it. Generally, probably not a whole lot of bringing it up. But unfortunately, the timing of bad news today meant that would be a day I would have to go through again.

—*Subject 28*

It's interesting. I mean it's hard to say 'cause that's my first time. I like the music on 'cause I feel like that kept me a little... silence tends to send your mind, you know, crazy. So I liked the music. But I don't know. I've never had it with music the whole time, so I really don't have anything to compare it to. I just think I did. [Experimenter: Any thoughts that you were thinking of? No negative thoughts or memories?] Huh-uh! Huh-uh!

[Experimenter: So you weren't thinking about anything specific while you were floating?] Um random like, 'I'm itchy!' I thought the water was getting in my earplugs and it was [laughs] stuff like that!

—*Subject 34*

That I was just in peace and all my worries were gone and I didn't have to take medication to get there.

—*AL454*

Like in the beginning, I think I was thinking a lot about, 'Relax your body. Relax your body. Where are my hands going? Where are my hands going?' [laughs] So kinda thinking about like where my body position was. And then, after that, when I finally was able to like relax and just be, I like was thinking about like I have some work issues and so I was thinking about that. And then my wife. I was thinking about how much she would enjoy this. [laughs] Because she needs to de-stress. And then I went back to work. And then I was like doing breathing exercises about the short and then the extra long. And then thinking about just focusing on my breathing and just listening to it instead of anything else around me. And that really helped me like settle down. And then that's when I like was starting to like blank out my mind. And I feel like that was probably after a good fifteen... twenty minutes. But yeah, then I was good the rest of the time.

—*Subject 45*

I was thinking about what I have to do coming in the near future. But it was in a positive. So I seen it being successful. So it was mostly that. I didn't, too much, think about past memories or anything negative. So the whole experience was pretty pleasant and positive.

—*Subject 46*

What did you think about, if anything, while you were floating?

Well, lots of things. [laughs] I mean it kinda seemed like it kinda went in stages. [Experimenter: No negative thoughts?] No! And from that survey, it kinda surprised me that it had all these questions about worrisome and what have you, because I didn't have any anxiety at all while I was floating. Really is kinda introspective in a lot of senses. Just really—yeah, again with these stages, first of all, it is kind of distracting at first. Maybe 'cause of, you know, laying naked in a pool. So, you know, kind of getting past that. Then my mind would settle down and went to other things. And where introspective, I guess, is really kind of a lot of it was the—I thought about people that have passed and also about how to be—or I guess, maybe, the need to be more present in my current family's lives. Things like that. My mind wasn't really racing, but it'd go from a couple different topics, and then I just thought to myself, 'I need to try to just clear my mind,' which was really hard to do. There's probably five or six times where I had a little jerked where—it wasn't any major—a lot of times, I'll have a big major jerk if I'm falling asleep on the couch or in a chair or something. These were just kind of mild ones. But they were enough to know that I was getting to the point of almost falling asleep.

—*Subject 48*

Just like random thoughts like before you fall asleep. Kind of thoughts like that, but not really—I was surprised about how clear like my mind was actually.

—*Subject 49*

I was just—I think I only thought of like for a few minutes—and that was at the beginning,

when I got in—I was like, 'Okay.' So I got out my list. I was going through my list I was gonna take for my trip this weekend. Yeah and I'm like, 'I guess I got everything ready.'

[Experimenter: No negative thoughts or memories?] No!

—*Subject 50*

Did anything surprise you during the float or happen unexpectedly?

No.

—*Subject 33*

No.

—*Subject 20*

Huh. No.

—*Subject 35*

I felt a lot more aware of my surroundings. So, every time that I was getting ready to hit the side, I felt like it coming on. I don't know if I was just realizing that the space was getting closer or what, but it seemed like every time that it would be like, 'Oh yeah, I'm getting ready to hit the side over here.' I mean I was—had no idea which way was what in the room, but...

—*Subject 5*

No. Not really.

—*Subject 42*

Mm-mm.

—*Subject 24*

When I first got in there, it was like—I don't know. I had like a little bit of anxiety 'cause I'm like, 'What if somebody come in here and drown me or something?' [laughs] But no. It wasn't a bad experience at all.

—*Subject 9*

That whole out-of-body thing. It was like feeling—it's so hard to explain. It's probably the first 5-10 minutes, there was like this emotional thing that almost made me wanna cry. It was like I was just—all of a sudden just aware of this complete—I don't know if it was like an emotional release that—'cause I

know you're a doctor. The closest thing I can explain it to, is in some past relationships, sexually, I felt that when I've had an orgasm and I've cried. Because I—and I used to do that a lot—all the time. Because I've gotten older and things don't happen as easily. I haven't done that in a long time. And when I got in there, and I just relaxed, that was like the closest—not in a sexual way, but in a very emotional way. And I didn't cry, but I came really close to it. And I couldn't explain why. That was the—weird. And I'm, you know, so it's probably the first time I've really relaxed in a long time. [laughs] Yeah, it was really weird. But that whole out-of-body experience was like 'Woah, is this what it's gonna feel like after you die?' You know? But it was a pleasant thing. It was very pleasant. So it was kinda cool.

—*Subject 16*

[no response]

—*Subject 30*

Nope.

—*Subject 40*

No. No. The colors that I saw, I was happy to see them because sometimes I see those colors when I meditate.

—*Subject 2*

[no response]

—*Subject 38*

Nothing. Nothing, really. Yeah.

—*Subject 10*

No.

—*Subject 43*

Did anything surprise you during the float or happen unexpectedly?

Um, I don't know. I mean it did—I mean, it was a different sensation just being there. Like, just still. So, I guess that was really—it was unique in that sense.

Um, I think it kinda surprised me how—not how quickly—but how—just kinda how it just happened. It was kinda just you're in like one state and then it just kinda transitioned; kinda something like that [laughs].

—Subject 4

Mm-hm. Well, kinda like close to the end, I felt like was falling. I guess I was waking up.

—Subject 14

No.

—Subject 37

No. But because I've read up on it a year ago. When they first became popular or when Tulsa got its first, I read up on it and why it's used and why people like it. So I knew what should have happened, and I think if I didn't know what was going to happen, I would've been more freaked out.

—Subject 22

No.

—Subject 6

I really thought, um, I was going to go into this deep relaxing state and just letting go; I never thought that it would have the opposite effect and give me a little bit more energy and clarity. That's what I was really surprised about.

—Subject 11

No. Mm-mm.

—Subject 31

[no response]

—Subject 29

Well, like I said, just that feeling like all my muscles are gonna like... That's almost—when I first got in, it felt like there was—'Oh my gosh, my body's gonna cramp up!' And which it didn't! But I've had cramps before and I hate that feeling! [laughs] So it was a little scary, but I kinda had to pay attention because, you know, like you talked about the back and neck tension. And I was paying attention to that, but I'm noticing like my toes, for instance. Like my toes are gonna cramp up! And I had to like really pay attention to them. And just relax them. Like everything I guess was tense, so I had to like relax everything on purpose.

—Subject 36

No, not really. I knew because I love water and, you know, if I had it my way, I would have one of—I would love to have one of those in my house. I mean, I'm just, you know, I'm a bath person anyway, and I like to relax in water. And so, you know, that was just like... I didn't—you know, you mentioned that you might feel a little of the, you know, of the build-up, but you know, that—I'm kinda used to the, you know, going to the beach, or used to feeling, you know, so that was not a sensation that alarmed me at all.

—Subject 1

Did anything surprise you during the float or happen unexpectedly?

Not really, no. The water was just almost perfect.

—*Subject 44*

Nope. And the water and the towel next to the float pool itself was a great idea, 'cause I definitely utilized that. [laughs] You don't even think about it. You're waving your hand and you're like, 'Okay, it's in my face now.' [laughs] So, that was definitely handy.

—*Subject 13*

No. I mean the—like I don't know that I actually fell asleep, but I was really—I was trying to focus on staying awake so I could kind of, you know, live the sensation I guess. And I know it, again, was when I coughed, it was—you know, I don't know if I woke up or if I just came out of kinda that, you know, being able to not think about anything—sensations. So and that was really about it. I mean I was surprised that I didn't fall asleep faster 'cause, you know, I have to wear a CPAP when I sleep. And I have a really hard—you know, usually I sit down in a chair for 5 minutes and I'm out. So I thought, you know, I'll just be sitting here and I'll fall asleep as soon as soon as I close my eyes.

—*Subject 12*

No.

—*Subject 47*

[begins crying] Excuse me. These aren't like sad tears. Like I'm very emotional in the opposite way; of appreciation. And it was for me, for my calming, my experience, for my healing. Like thinking about walking out of that door, I was like, 'Wow, I'm gonna have

to go back in the world.' And, you know, a lot of the normal things that I have to experience. And I did feel a sense of dread. But it did turn—make me go right back into more of a positive of... that I got that experience. That I know it exists. That there is something. Does that make sense? [Experimenter: How would you separate those (Epsom salt baths at home versus floating) in terms of differences?] I mean I tried real hard to just be in the moment and be there and make it for myself, but life isn't gonna stop. And you're still having to do a duty and a process and know what you need to do before and after. And animals. And phones. And it's completely different. Like you shut that door and that's a world. I guess I wasn't expecting that. [Experimenter: How about the pain?] That is amazing too, because I mean I carry it all the time. And there—you're right about having to find it and like let go. And I had to. The mindfulness did help because I would think I was completely relaxed, and I would start, 'Okay, how does this feel? How does that feel?' And I was like, 'Okay, I can even relax more! That is still tense. And I can let that go.' And I did a lot of those like when you were young, you would really just stretch your whole body out and you could really feel how tense that was. I did a lot of that! And it felt really, really good! And I did do the I'm-just-relaxing-with-my-arms-behind-my-head. So the stillness was still there. But I really did try to find ways and other ways of what it felt like! And what was relaxing. And so yeah, like even breathing and thinking about your breathing. Like just think about it, remind yourself of it, because you get—you still—even when

Did anything surprise you during the float or happen unexpectedly?

you're in a relaxed state, you can forget and it helps to remind yourself and think about it; 'Well, how is your neck feeling? Well, how are your toes feeling?' You know? [Experimenter: Did the pain actually go away or was it always still present?] No, it went away! Like the tension was—it was a different tightness. I can't explain it very well, but it was not there because something else was holding it. There wasn't a weight... pulling you down. 'Cause I even could feel my spot. Like the main spot that I always feel when the injury happened and everything, and it still wasn't a pain spot even though I could still feel—and I know that's where it was and that is the issue. [Experimenter: How is that different or the same as when you take morphine?] I never go away from the pain with morphine. It's just more of a try-to-get-through... and you're still gonna have to do life things. You're gonna be painful, so you put a little bit of a coating on it. It's always completely still there. I mean I go through all kinds of stuff. I do a process of things that will not ever alleviate anything.

—Subject 3

[no response]

—Subject 7

Well, I know I popped my knuckle and it was a little louder than—[laughs] but I knew it was me. And I think like 5 or 10 minutes later, like I heard something and it sounded like a pop again. But I was like, 'I don't think that was me,' you know? But I went ahead and shut the light, you know, and thinking my eyes were going to adjust, but it was so dark in there, my eyes did not adjust. But I mean I knew at any time, I could, you know, get the

lights back on. But you know, I just was kind of, in a way, trying to fight these normal anxieties. You know, knowing—I just kept—which is a little different for me 'cause normally whenever my anxiety gets going or I'm stressed, I get stuck there and I don't realize it. But like I knew it was a safe environment. And I knew, you know, even though my mind was trying to play tricks on me and run with, 'What was that noise?!' [laughs] Like, 'Is somebody creeping around in here?' You know? Like I, you know, just kept kinda like feeling my body like, 'Oh, this feels so good and this is a safe environment! Just kick it out!' Like in a way, I knew that it was a safe environment. And so if I heard something, it would kinda freak me out a little bit, you know, at first. Then I was like, 'I don't care.' [laughs] 'Whatever!' Which is, like I said, different; 'cause normally I'll get stuck there and I can't pull myself out.

—Subject 8

No. You know, I think I was just, again, like I was wanting to be aware of like when the music stopped and when the lights were gonna come on. But other than that, I mean there wasn't anything that was like surprising. I think, you know, like I said, it's interesting getting used to—'cause I mean, you know, you're gonna float, but I think like just adjusting to where you're thinking like, 'Okay, it's like alright to, you know, let go of that tension in your neck,' or, 'It's okay to like let go of your arms and like, you know, whatever you have going on in your shoulders because you can put them however you want.' You know? Literally, you don't have to be worried about, 'What if this...?' You know, 'What if my arm falls asleep?' 'Cause I feel

Did anything surprise you during the float or happen unexpectedly?

like sometimes I do, then, when I actually sleep. 'Cause I might sleep on it or in a funny way. So maybe it's like surprising getting used to how much you can let go of those like normal sensations and normal—you know, 'cause, for me, I think sometimes you wanna feel like you're kind of like in control of something. And I think sometimes like that wanting to control something means that there's like a lot of tension put there; whether it's knowing like consciously or unconsciously. So I think it was surprising how much you can consciously kind of just, you know, say, 'Okay, I can feel maybe some tension like in my back or in my neck or in my shoulders.' And I can kinda just let it be. There's, you know, the water, you know, is supporting me and I can actually—you know, I can feel the tension and I can start to like kinda just let it go and relax.

—*Subject 15*

Not really. Just, you know, occasionally I might hear a sound; like a piper or something and I'd think like, 'Oh, what was that?' And I think that [the amplification in room] just combined with my general like getting used to the experience and everything. I maybe like would pay attention briefly more to like a click or a pop than I normally would.

—*Subject 17*

Besides floating. [laughs] No, not really, I don't think. Now that I like look back, it feels like it went by so fast, but [laughs] I don't remember each.

—*Subject 18*

I don't even know how to describe it. I felt like my back, like upper back between my

shoulders—I almost felt like they were more tense coming out than they were goin in. And I was taken by surprise at just how shaky I was, trying to get out. And so that was surprising. I mean I remembered what you said about moving at a slow speed. And that's great advice because if I had tried [laughs] to go any faster, it would've been disastrous. And so yeah, it took my eyes a few seconds longer, I think, to kind of focus 'cause suddenly we're having to key in to where we are in space and make sure we're upright and everything's working and that we're ready to stand up. So that was surprising. I was very surprised just how floppy they (muscles) felt.

—*Subject 19*

Yeah! The lack of physical sensation, at some point was. Whenever I realized that that had happened, that was very strange! That was really strange! It still is kinda blowing my mind a little bit.

—*Subject 21*

No, other than falling asleep. 'Cause I've never done that before. And probably the—well I may have fallen asleep twice because I do remember sort of twitching just a little bit, which I've not done before.

—*Subject 23*

No. It's just kinda funny that you bump into the sides. And I had wondered where my body was in the room, but nothing unusual.

—*Subject 26*

So, well, whenever the fish kept on pecking at my feet. I didn't know you guys had fish in the pool, but... okay I'm totally kidding!

Did anything surprise you during the float or happen unexpectedly?

Totally kidding! [laughs] No, nothing really! I put in the, ‘totally kidding,’ so they would know that I wasn’t actually... Yeah, so but some fish would be nice! They have those fish in Mexico that eat the skin off your feet! And so yeah, throw a couple of fish in there! Except for it being saltier than the Dead Sea. No, nothing really unexpected! And again, I couldn’t slide right into it, you know? The same as before, I was a little bit anxious right at the start. Just kinda getting comfortable with myself and then—the neck thing. So kinda making sure that my neck was loosened up or whatever. But nothing, yeah, crazy or unexpected!

—Subject 27

Well, I suppose nodding off—or if I did. Whatever I did that kinda jolted me. Beyond that, no, I was very fascinated with the crystallized sensation of the salt on me; but managed to like not pay attention to myself. My toes got cold. Like apparently like the tips of my toes were sticking up. And I believed—every once in a while, I’d tuck them back down under the water. And I think that the air temperature was perfectly fine. I just think that, maybe, my toes weren’t getting enough circulation in there and they’re like, ‘I’m cold.’

—Subject 28

Probably the temperature! I was a little leery about being cold or not, but it was pretty perfect!

—Subject 34

Just to float, float above water.

—Subject 39

[no response]

—Subject 45

Well one thing; my body felt kinda heavy. Like especially I noticed when I was getting out of the pool. That’s one thing that kinda surprised me. I didn’t expect that. I feel very relaxed right now. [laughs] Almost like I could go to sleep. Very peaceful. [laughs]

—Subject 46

Well, the only kinda weird thing was my shoulder started to hurt a little, you know, after I was in there for quite a long time, because of the old injury I have. But at night, when I’m sleeping, I put this arm up above me like this, the pain goes away. So I put both arms up, and the pain completely went away that way. But it made me feel a little more vulnerable, I guess, which is kind of a weird feeling. The pain completely went away to where I could get back in that relaxed, almost out-of-it stage again.

—Subject 48

No.

—Subject 49

Yes! [laughs] Well, I was telling her like when I barely like put my first foot in, it was just floating already, and I was like, ‘What?!’ I was trying to put it down, but it wouldn’t stay down ‘cause it was floating. [laughs] And then like, ‘Oh, that’s what it means to have a different type of salt in it.’ And once I started to go in, it was kind of like I already felt like the gravity was not as heavy.

—Subject 50

Did you learn anything about yourself during this experience?

I had a hard time being still, but I think I kind of knew that anyway. The only thing I had any issue was that there was a difference in the, for me, a difference in the air temperature, and it only affected my toes. So every once in a while, I'd dip my toes in, which of course—then a few seconds later, they would feel cold again. I don't think there was really that much difference in the air, but for me. Yeah, and the only other thing is—and it could be because I have a colder—I think I have a cold, but my breathing, it just felt like the being in water, it still felt like everything was dry. Okay, it wasn't just my imagination [laughs]. It was very pleasant. I'll give it that. I mean I don't know what it's supposed to accomplish altogether, but it was a very pleasant experience.

—Subject 33

I didn't think I would get as relaxed as I was, but I was pretty relaxed. Yeah. I feel like I could sleep really easily right now.

—Subject 20

Just that I need to like stop and calm down; I mean [laughs] basically.

—Subject 35

Don't know if I learned anything about myself. It did sort of reiterate the need of having a meditation or something like that daily really just does affect everything throughout the rest of my day. So sometimes it's easy for me to get off that. And it's nice having something that's like, 'Oh no that's—you need to do that. That's... that's good for your mind.'

—Subject 5

I need to buy one of those.

—Subject 42

That I love to take a long hot shower. And I'd be one of those people who probably needed to say to, 'Don't take too long because you gotta get it ready for somebody else.' I don't know that there is anything negative to say about it other than the fact that I could've stayed in there a whole lot longer had I not done what I did with my arm.

—Subject 24

I wouldn't say 'learned something,' but I guess I learned something. That whatever that is in the water, that type of setting can help me not stress so hard and just like calm myself down. I don't know. Take the edge off of the thoughts. That just helped me not like overreact to my thoughts and all of that.

—Subject 9

I learned a couple things. One, I learned that I was able to go like somewhere else in my mind, which I've not. Different from that beginning feeling, when I kinda had that out-of-body experience thing. I don't know that I've ever done that before. And I didn't really know that—cause when I've heard people say that stuff, I'm kinda like, 'Psh!' You know, 'Whatever!' [laughs] That was really—it was really cool. I learned, again, that it's extremely hard for me to turn my brain off.

—Subject 16

Yes! Yes! I learned that through paying attention to my sensations—my body sensations—or maybe just being more aware of my breath even at times can help me relax more. I always tell my students 'deep

Did you learn anything about yourself during this experience?

breathing. And think of positive thoughts.’
And it’s very easy to say all of that and try to help somebody get there. Thanks for the experience.

—*Subject 30*

I think I’m addicted to outside stimuli.
[laughs] I really do. Not so much like a phone, but like a book or something to focus on. Yeah. I don’t think I know how to just be anymore.

—*Subject 40*

Yes. That I could sleep with a night light on. I don’t like being in the dark. It typically makes me feel very anxious, and so that is something that I wanted to do—I wanted to have the lights off, see how I’d do. I was able to let go. I was able to not be afraid at all in there and feel safe. So that, to me, it’s not something that I learned about myself, but it feels like an accomplishment. It was wonderful. Nice Christmas present! [laughs]

—*Subject 2*

I wanna let go, but it’s kinda hard for me. All that tension I felt—I was trying really hard. And then I thought ‘You know, maybe I should just stop trying and just let it go.’ Because I’m a people pleaser.

—*Subject 38*

I don’t know. I don’t think so, but I think I will come back after a few times.

—*Subject 10*

Yeah. I learned that, right now, I’m not capable of relaxing and clearing my mind for a full 60 minutes. I’m just keeping it honest.

—*Subject 43*

I kinda did. I felt more present, like I said earlier. I think it kind of feels like it put things in perspective, ‘cause the only time you really think about like actually being here—just like, I don’t know, being present or whatever. You don’t really think about it until you’re like basically gone like in there. [laughs]

—*Subject 4*

If I just take the time and kinda have a moment to myself to where I don’t think about anything, I’ll feel a lot better. Instead of thinking of all the negativity things; what I should have done. You know? Things like that.

—*Subject 14*

I should do this more often. Cause I had some anxieties about my week last week; when I came outta there, it just all went away.
[laughs]

—*Subject 37*

Yes. I wasn’t expecting to be anxious at all. Like I was actually really excited, because I’d read up on it, and those things are ninety-nine dollars for three sessions. I didn’t realize I was that anxious of a person; or so easily terrified by my surroundings.

—*Subject 22*

No I don’t think so.

—*Subject 6*

That a part of me is still in there. That I always feel so disconnected by my circumstances because they’re so abnormal. And there’s always this sense of dread that it’s like, ‘This is it.’ Then, every now and

Did you learn anything about yourself during this experience?

then, you have this opportunity to experience a part of yourself and it's reassuring to know that it's still there. It's not destroyed by brain damage or anxiety or just living with PTSD. That was a really good opportunity to alleviate so many different things and just get a nice quick opportunity to get closer to yourself. To know that you're still there.

—*Subject 11*

I guess. I mean, like anyone else, you have things on your mind. But I guess you can kind of put that stuff on the back burner. You can kinda put it away, once you're in the right setting. And you know, things may not seem as bad as they are, once you kinda give yourself a break and kinda be to yourself.

—*Subject 31*

[no response]

—*Subject 29*

Yeah! It's really weird. I was filling out the questionnaires, in the before and after. And it's hard with the questionnaires, because the words mean something totally different to everybody. I felt happier and more energized and everything; and I'm feeling less strong and less determined. I would've thought that those are positive things. And then I'm like maybe that wasn't what I thought it was.

—*Subject 36*

I think I can really mention from a small town, closed-mind, everybody, you know, kind of having the same way of thinking; the whole new age, I could see where that would be something I could get into. The mind, the body, the soul. I really felt like that could be something I could look into further.

—*Subject 1*

Mm-mm no.

—*Subject 44*

I don't think I learned anything new about myself, but I did kinda confirm things that I was thinking I knew. I know that I normally think all the time and that I rarely stop thinking. Even whenever I try to relax, it's harder sometimes. But I think it just kinda helped me almost come to terms with how I function. It kinda helped me figure out that's okay.

—*Subject 13*

I don't know. I guess just that kinda knowing that everything can be shut off.

—*Subject 12*

Yeah, I guess I did. I guess it was easier than I thought to not let negative thoughts get into my head because I thought for sure that, you know, that's the first thing that would happen. But it didn't. I guess maybe because I knew beforehand that this was gonna have to do with not having negative thoughts during this. So maybe I subconsciously—I don't know. [laughs] I don't know.

—*Subject 47*

I have a lot of negative thoughts about myself and stuck, hopeless feelings of life and myself. And I also know there's a lot of beauty, but it has just been stuffed. So I felt that grow. I felt that I was in there. Still strong. Still could fight through it. That there is a little bit of hope. And of course, I always—the mantra is to keep going, but there was more, I guess, sort of faith with that. Like you could touch it if you... I can't explain it. It was touchable. It was there.

Did you learn anything about yourself during this experience?

Things could be better. There was a reconnect in so many areas! And so yeah, my body and soul kind of like, ‘Hello.’ Sort of like the childhood innocence of—because that sensation is—I know it sounds weird—but motherly. Do you know what I mean? Like I even wrote that in one of the things. Like a Mother Earth kind of thing. And I really love this mural because of that! That’s exactly the feeling without saying anything. And the reflection. It should be called, ‘Reflection.’
—*Subject 3*

Nothing that I didn’t already know really. And just I need to calm down. [laughs] And I need my thoughts to stop, which they don’t. Ever. And I am very restless. I’m wondering if it’s like me or if it’s something that can be helped. But that’s why I’m going to therapy. So I’m kind of debating whether I should change my prescription ‘cause it’s not changing much of anything. I don’t feel like it is.
—*Subject 7*

You know, what I was talking about, you know, with that little anxiety that kinda popped up, you know, I would like to somehow figure out, like how I defeated that in there and twist it and somehow try to figure out how to apply it to, you know, my life outside of here, you know? ‘Cause like I said, normally I would get stuck in it. And sometimes when I realize that I’m, you know, in it, you know, in that anxiety, where everything, you know—and I don’t know. I would like to figure out how to—I mean as small as it might sound, like to me, that’s a big thing. ‘Cause I heard a noise and I’m like, [laughs] ‘Is somebody gonna come push me

under the water? Drown me?’ Like, you know, I mean these are real things that go on in my head. You were talking about a little... you know, and that wasn’t too bad. Like in a way, think it’s just because, you know, people don’t know how to relax. And then, you know, this part is obviously lighter weight than your head, and so you’re like... [laughs] you know? But I did notice—and, you know, I think that’s just my body storing, you know, those are the places that it stores that stress that I maybe don’t even realize. Like I know it’s normally here, but you know, after some time I felt, you know, my joints. Like I felt a lot here and then my knees a little bit, you know? And I’m just thinking that that is just, you know... So you know, outside of here, that’s some stuff that I kind of wanna focus on too, is, you know, how to try to alleviate some of the physical symptoms. And I definitely have a lot more energy now. [laughs] Because I think like I don’t know how everybody else is, as normal people, but with me and my stress and my mind going constantly, like it just takes away my energy. Like I know that that is why I’m just physically just drained all the time. And mentally! You know? It’s because my brain. And I can’t just slow it down. So I kinda feel like I just slept for three days. [laughs] You know?
—*Subject 8*

Well, I don’t know. I feel like there was a couple different ways that I like kinda had my arms just positioned through the time. I felt like there was probably more ways I found to where I could just kinda like let them be and not like feel tense or like, ‘It’s gotta be here. It’s gotta be there.’ Probably how much

Did you learn anything about yourself during this experience?

tension I like put in my jaw, because again, like I was listening to breathing. And as I was doing that—like I know that I tense my jaw, but I didn't know how often. 'Cause I mean I'm in here and I'm thinking like, 'Okay, this is, you know, like I don't have as, you know, as much tension in my neck as I normally do. Or in my shoulders or my arms.' And then I'm kind of like trying to just feel the rest of my body and where you'd feel like, 'Why would there be tension when you can literally just let it like support you?' And I could feel even more like just that, for some reason, wanting to like keep my jaw tight even though, clearly, you don't have to and there's no need at all.

—Subject 15

I felt like I could see something like this like being beneficial to me. It felt very soothing, kinda like meditating. But I really tried to—I don't know if focus, but really try to tune in like the weightlessness and the not feeling a whole lot. And just kind of seeing what that was like. And it did feel good. So I felt like, you know, if I was to do—I could see reaching out or seeking something like this out again.

—Subject 17

No, I didn't really. I don't think I really learned anything. I was just trying to stay like quiet and just like enjoy it.

—Subject 18

I did. After, you know, [laughs] as I was in there getting dressed, I was thinking, 'It's interesting that my mind is always looking for something to focus on.' That it's that driven to—it has to be doing something right now.

All the time. And I don't know if that is a consequence of my background or if that is a consequence of like a heightened world technology that we encounter every day because we're so accessible all the time. But yet, we don't develop this type of alarm fatigue that a lot of clinicians develop when they hear the same alarms go off over and over. So it was just kind of food for thought. I was like, 'I didn't realize my mind's always searching for something to focus on and gets very restless like that when there's nothing to focus on.

—Subject 19

Probably! I don't know what yet, but [laughs] probably. Yeah, it's different! And I would say that I've learned that, if anything, right off the bat, that there is some obvious benefit for me to find a way to remove myself from the world around me. And so probably I need more of that!

—Subject 21

[no response]

—Subject 23

I learned that I could put my head halfway under water and trust that the earplugs were gonna work; 'cause I usually don't ever put my head under water 'cause water usually goes right in my ears. And that I can actually feel weightless without the pressures of my joints.

—Subject 26

No, not really.

—Subject 27

Did you learn anything about yourself during this experience?

Not necessarily. I was actually a little bit surprised at how easily I was able to re-relax because, as a person that normally relaxing is not the easiest thing to do, I had a feeling it was gonna be like, 'Oh heavens, let's start all over.' And normally, if I'm in like a dark place, I feel somewhat claustrophobic. And I suppose, since I had my arms out kind of like this, I didn't feel that. It wasn't like the MRI sensory deprivation, but it might as well have been. I didn't really need to move! I guess the knowledge that I had the ability was perfectly fine.

—Subject 28

Yes. I can't stay still for very long. [laughs] And an hour float seems to be a long time.

—Subject 34

Yes. I learned that medication isn't always the answer. That out there, I could search for, you know, other things to do like relaxing. Taking a hot bath might ease it before I take medicine.

—Subject 39

Yes. I need to figure out how to relax! [laughs] And just maybe I need to make an actual effort to do it; instead of being like, 'Oh yeah, I need to chill out,' and think it, and keep going. I actually need to do it because I feel—the way I feel now, if I could feel like this at other parts during my week, I feel like I would get more stuff done and more accomplished and I would have that clarity of being able to do what I need to do instead of having like the anxiety and worrisome. And so I feel like I need to learn how to relax.

[laughs]

—AQ987

I did! One thing that I really want to change about myself is how I focus. 'Cause I don't think I'm very good at focusing. And also I feel like I can use this type of technique to help even manage my emotions to kinda focus and be more logical because I tend to be more emotional about things. And it helped me to focus and to think about like things I need to do in my future without like the emotion attached to it.

—Subject 46

Well, I mean I think just kinda like what I stated as far as, probably, the need to be more present around other family members.

—Subject 48

I just—I don't know if I learned anything about myself, but I was just very relaxed. Like honestly, I would compare it to getting out of like a yoga practice and feeling really refreshed. I feel more refreshed than I did waking up this morning. Like I feel very energized and like refreshed and just, yeah, I feel really good honestly.

—Subject 49

In that type of water, my neck doesn't hurt when I'm floating. [laughs] And I think that's it! Like that's just my body; how it gets there. Like I was telling her, I love floating already. Like in a regular pool with my daughter. And I struggle with balancing my body and breathing and then exhaling and inhaling in order to keep the body stay stable. But if you don't do that, your neck would go down. But in this water, it's like you're breathing normal and you're already floating straight. So your neck is not tense! So my body just relaxed.

—Subject 50

Floatation-REST procedure

In order to minimize bias and demand characteristics, several points were emphasized prior to floating. During the informed consent process, each participant was explicitly told, “this is a research study on a technique that we know very little about, so we cannot make any promises that floating will help or benefit you in any way.” Before completing the self-report questionnaires, participants were reminded, “there are no right or wrong answers, we just ask that you answer as honestly and accurately as possible.” In addition, participants were told that this initial study was focused on learning more about what people actually thought of the float experience, while reiterating that this could only be achieved if participants were honest and forthcoming.

Before floating, each participant watched a short instructional video providing a basic overview of the procedure and was given a tour of the float facilities. All participants were instructed that they could float “for up to 60 minutes” and could stop floating at any time. They were also instructed on how to turn the blue light on and off using the air switch and wave detection system, and told that the choice was up to them as to whether or not they floated in the dark or with the blue light illuminated. A shower, located adjacent to the pool, was used before and after the float session, and all accessories (e.g., unscented soap, shampoo, and conditioner) were provided. At the beginning and end of each float session, the song “Relax” by Blank & Jones (Relax Edition One, 2005) was played through the speakers, signaling to the participant that an hour had elapsed. Participants were instructed to use the restroom beforehand, disrobe in the changing area, take a shower, and then enter the float pool. They were also read the following script: “*Throughout the day, our brain and body are constantly bombarded by sensory information from the external*

world. In this study, we aim to understand what happens when you get a chance to disconnect from this constant stimulation by floating in an environment with reduced levels of light and sound, and reduced pressure on the spinal cord. While floating, try to find a place of stillness of both body and mind. You have complete control throughout the experience and can stop at any time. During the float we encourage you stay awake and when the float is over we will turn on some music for you. There is no rush, so please take your time exiting the pool.” After showering and redressing, participants completed their post-float measures followed by the debriefing interview.