one-11 Labs — Sound & Consciousness Research Notes

Graded evidence on sound, space and the nervous system. A Stagebot lab.

Public edition — research through 2026-11-16

Each thread gets an evidence grade so a hope is never sold as a fact. Findings are compiled with AI assistance and reviewed by the lab; sources are listed at the back. Nothing here is medical advice.

Grade	Meaning
A	Strong: multiple randomized controlled trials or a solid meta-analysis.
B	Moderate: at least one good RCT or consistent controlled data; large trials pending.
C	Preliminary: small, open-label or mixed studies; promising but unproven.
D	Anecdotal / fringe: claims not independently replicated; mechanism conflicts with accepted physics.

Scoreboard

Thread	Grade	Bottom line
Kozyrev mirrors	D	Soviet-era claims (telepathy, time effects) never replicated. Torsion-field physics not accepted. Useful only as inspiration and as a set-and-setting chamber concept. Newly catalogued mainstream cousin: Caputo's mirror-gazing work (Univ. of Urbino) — dim light (~0.8 lux) plus a few minutes of staring at one's own reflection reliably produces 'strange-face' illusions and mild dissociation in healthy people; real, measurable, and the honest science under the mirror-chamber stories (Grade C for the illusion itself).
Floatation-REST / sensory reduction	B	Large acute drop in anxiety in a clinical sample (incl. PTSD); small RCTs. Closest proven cousin of the mirror chamber. New (Neurosci Conscious, Aug 2026): in a 3-arm randomized feasibility trial, floating produced a measurable psychedelic-like 'boundless' state ('aquahenosis') vs. a zero-gravity chair, which mediated gains in positive affect (exploratory). Newly catalogued (BMC Complement Med Ther, May 2026; n=14, qualitative): one 60-min float unfolds in four phases — acclimatize, transition, altered state, reorientation — with the altered state building gradually; time/space orientation and body sensation fade. 2026 within-subjects study (n=48): guided meditation beat a Ganzfeld on lowering arousal; trait absorption predicted who lost body-boundary salience — screen participants for it. Safety note (Brain Sciences review, Jan 2026): short, voluntary restriction helps; prolonged or involuntary deprivation is a stressor, and people with schizotypy, high trait anxiety or psychiatric history are more vulnerable — screen them. Newly catalogued (Nov 11): multi-day **dark retreats** are now being studied — Northwestern/IACS pilot (3 days, Oregon; n≈6–10 with Oura/EEG/ECG; preliminary, no stats) found longer sleep, more vigor and more willingness to discuss negative emotions, but **higher anxiety** afterward; a registered Polish 72-h pilot (NCT07429617, n≈20–30) will test worry, HRV and safety.

Thread	Grade	Bottom line
Monroe Hemi-Sync / binaural beats	C	Real auditory brainstem response; EEG 'entrainment' inconsistent (5 of 14 studies supportive). A 2026 randomized study found a 1-min binaural-beat clip did not lower arousal (singing bowl did). Experience is real, mechanism is debated. Newly catalogued (Front Neurosci, Jan 2026; n=60, three active arms, no sham): alpha- and gamma-beat groups showed theta-network changes linked to working memory; beta did nothing. Texas Tech is running a sham-controlled fMRI trial of EEG-guided binaural audio for musicians' performance anxiety (NCT07407426, n≈32, results 2027). Nov 7 deep sweep: still no Monroe/Neuphoria results published. New (Music and Medicine, Oct 31, 2026; Chiang Mai, randomized crossover, n=28 stressed office workers): 15 min of music with superimposed binaural beats lowered systolic BP more than the identical music without beats (median –6 vs 0 mmHg, p=0.024); diastolic BP, heart rate and HRV did not differ. Single session, wide spread — but it is a properly matched control. Newly catalogued (Int J Psychophysiol, Oct 18, 2026; Toronto Metropolitan Univ.; RCT n=83 anxious students): 24 min of mood-personalized music + auditory beat stimulation cut cortisol more than twice as much as volume-matched pink noise; anxiety, mood and HRV improved equally in both arms. Co-funded by a music-app company; can't separate music from beats.
40 Hz gamma light + sound (GENUS)	B	Safe for years of daily use; slowed brain atrophy in small trials. 670-patient Phase 3 (HOPE) results expected 2026–27. New (Sept 2026): immersive VR delivery feasible in 11 patients, with strong 40 Hz EEG response vs sham. New (Sci Rep, 2026; n=15 healthy, single session): a 40 Hz vibrotactile glove entrained the cortex about as strongly as light+sound and was far better tolerated (~68 vs ~12 min/day judged tolerable). Newly catalogued (Biol Psychol, Feb 2026; systematic review, 22 studies, healthy adults): flicker, tones and combined stimulation all entrain gamma reliably, but effects mostly end when stimulation ends; red/heterochromatic flicker tended to beat white, invisible flicker was better tolerated, and 32–38 Hz sometimes worked better than 40 Hz in older adults.
Focused ultrasound (consciousness)	C	MIT roadmap (2026) and thalamus studies — the frontier tool for causal consciousness research. 2026: single-arm thalamic sonication in 16 disorder-of-consciousness patients raised CRS-R scores (preprint, no sham); open-label pilot (n=20) targeting a default-mode hub cut mPFC–PCC connectivity and depression scores — the psychedelic 'DMN signature' produced with sound energy. Going wearable: UCSF opened a randomized sham-crossover trial (Oct 30, 2026) of a 128-element ultrasound headband (n=3 pilot only). Clinical/lab only. New (npj Acoustics, Oct 20, 2026): NYU's double-blind, sham-controlled crossover (n=10, one 10-min session) eased delusions in schizophrenia vs sham — small but the first blinded human result on this list. CMU (Nat Commun, Mar 2026): ultrasound alone was weak; paired with mild tDCS it drove strong targeted activity — a 'modulator, not a driver.' Reality check (Neurol Sci meta-analysis, Apr 2026; 3 RCTs, n=84): transcranial ultrasound vs sham did not significantly improve global cognition in Alzheimer's (SMD 0.31, p=0.54). Newly catalogued (Nov 9): a sham-controlled crossover in drug-resistant epilepsy (Epilepsia, Aug 2026; Taipei VGH, n=12) was safe but **missed** its primary antiseizure endpoint; a 2026 scoping review of psychiatric uses (J Neural Transm; 14 studies) found only ~3 sham-controlled RCTs and **no PTSD trial at all**. New critical review (Front Neurosci, Nov 10, 2026; Beijing): only ~37% of 177 completed LIFU trials linked to a publication; audible pulse frequencies can drive the 'neuromodulation' effect itself (multi-site Kop et al., 2024). Strengthens the sham-masking niche.
Singing bowls / sound baths	C	One RCT: single session raised HRV and lowered anxiety vs. muscle relaxation. 2026 online RCT (n=92): even a 1-minute bowl clip lowered self-rated arousal; binaural beats, pink noise and silence did not. Promising, low-risk, under-studied. Newly catalogued (IEEE EMBC, Jul 2025; n=8, no control): a 30-min bowl meditation raised SDNN and NN50 — weak, but the right physiology. Nov 5 sweep: no new 2026 trials found.

Thread	Grade	Bottom line
Room shape & spatial low-frequency sound	**C/D**	Newly catalogued (Nov 11). Frontiers in Cognition (May 2026; The Works Research Institute, Budapest/Amsterdam + Tübingen MEG): 59 healthy adults, eyes closed in a spherical speaker enclosure the authors call **'the Sphere'**, heard bowl tones (40/73/110 Hz, ~75 dB) projected into virtual rooms of different size and shape. Mood improved in all conditions; frequency alone had no discrete effect; **cube and cuboctahedron rooms lowered skin-conductance variance (arousal)**; EEG and heart-rate changes tracked local amplitude/phase deviations (R≈0.87–0.96). Single-blind, unbalanced subgroups, self-funded, correlational. First peer-reviewed data that room geometry itself shifts physiology.
Vibroacoustic beds / tables	**C**	Small studies only. 2026 Danish pilot (n=30): 20 min on a vibroacoustic board (incl. 40 Hz pulse) and guided meditation both made voices breathier vs. no-treatment — speech as a cheap relaxation biomarker. Exploratory (p≤0.1). Tactile 40 Hz now shows comparable EEG entrainment with much better comfort than flicker (n=15). Newly catalogued (Nov 9): Korean double-blind randomized pilot (Front Aging Neurosci, Aug 2025; n=30 healthy older adults, 8 weeks, head-worn bone-conducted 20 vs 40 Hz) — both arms improved memory scores; 40 Hz added a small depression drop and gamma-power gain. No inert sham, industry-funded.
Handpan & resonant instruments	**C**	Almost no direct research yet — a registered trial on handpan music for anxiety exists. First peer-reviewed handpan paper found (Arts in Psychotherapy, 2026): a qualitative study of music therapists' clinical use — experience, not outcomes. Nov 5 deeper sweep: still no handpan physiology/outcome study published. Open lane for us.
Transcendental Meditation for PTSD	**A-**	Lancet Psychiatry RCT (n=203 veterans): non-inferior to prolonged exposure therapy. Phase 3 multisite trials underway. Meta-analysis (Medicina, Apr 2025; 15 studies, >1,200 people): pooled effect ~1.0 vs controls (authors TM-affiliated). 2026 uncontrolled pilot in 39 evacuated Israeli civilians: PTSD, depression, anxiety and insomnia all fell over 8 weeks.
Music therapy (DoD/VA)	**B**	Already deployed at military hospitals through NEA/DoD Creative Forces — proof that government buys sound-based care. New mechanism (PNAS 2026, Univ. of Chinese Academy of Sciences; 2×60 participants): after a stress task, relaxing music beat natural water sounds on heart-rate recovery and positive mood (cortisol and skin conductance fell equally); fMRI showed auditory cortex→insula→thalamus rewiring, stronger with more musical tension. Newly catalogued (Front Psychol, Feb 2026; 24 RCTs, n=1,295): music raised parasympathetic HFnu (+7.05) and lowered LFnu vs controls (GRADE moderate); RMSSD, SDNN, LF/HF not significant; short (≤30 min) and self-selected music did best; high performance bias.

1. The Kozyrev Mirror [D]

What it is. Concave or cylindrical chambers of polished aluminum named for Soviet astrophysicist Nikolai Kozyrev, who proposed that time is an active physical force. The mirrors themselves came later — the Novosibirsk group under Vlail Kaznacheev and Alexander Trofimov built them in the 1980s–90s and ran sessions with a person seated at the focus, including Arctic experiments around 1990.

Claims. Altered time sense, visions, 'expansion,' long-distance telepathy, magnetic anomalies. Published mostly in Russian; the striking results have never been independently replicated in Western labs, and torsion-field theory is not accepted physics.

What is real, as an acoustician sees it

- A curved reflective surface **focuses** — light and sound. A person at the focal point of a concave chamber hears their own breath, heartbeat and voice concentrated back at them. That alone produces strong, real, reproducible altered states (heightened interoception, time distortion).
- Combine that with reduced outside stimulation and a trained facilitator and you get a powerful set-and-setting effect — the same engine behind sensory-reduction research (Section 2).

Room geometry changes the body (Frontiers in Cognition 5, May 20, 2026; newly catalogued Nov 11). Oomen, Val Baker et al. (The Works Research Institute; Univ. of Tübingen MEG Center; Eötvös Loránd Univ.) seated 59 healthy adults, eyes closed, inside a spherical loudspeaker enclosure ('the Sphere') and projected recorded singing-bowl tones (40, 73, 110 Hz at ~75 dB) into virtual rooms: three sizes of pyramid at 40 Hz; eight shapes (pyramid, tetrahedron, cube, octahedron, icosahedron, dodecahedron, cuboctahedron, sphere) plus a stereo control at 73/110 Hz. Mood rose in every condition (no silent control arm). Frequency alone showed no discrete effect; **room shape did** — cube and cuboctahedron lowered skin-conductance variance (calmer arousal). Local EEG power, heart-rate variability and EMG tracked how much the sound's amplitude and phase were distorted at the listener (R 0.78–0.96). Arousal rose in the first ~15 minutes and fell by ~40 (order effects). Limits: single-blind within-subject, frequency confounded with spatial set, unbalanced and attritted subgroups, enrollment over 12 months, fully funded by the institute that built the enclosure. **Grade C/D.** Why it matters: it is the first peer-reviewed evidence that a room's geometry — not just its content — moves physiology, and it argues the operative variable is **phase/amplitude distortion at the listener's position**, which is exactly what focusing in a curved chamber controls.

The mirror half, in mainstream terms (deeper look this week)

Mirror-gazing and the 'strange-face illusion' (newly catalogued). Giovanni Caputo (University of Urbino) built a simple protocol: a dark room with ~0.8 lux of even light on the face and several minutes of looking at one's own eyes in a mirror. Healthy volunteers commonly report distorted or unfamiliar faces, animals, relatives or 'other' identities within the first minutes, each illusion lasting seconds, alongside mild dissociation (feeling detached from the reflection). His 2013 review (Behavioral Sciences 4:1–13) pulls this together: strange-face illusions are markedly increased in schizophrenia and reduced in major depression; he interprets them in Jungian 'archetypal' terms (interpretation, not evidence). **Grade C** for the illusion itself (repeated in multiple small lab studies); **D** for any meaning beyond perception. This is the honest science behind the psychomanteum and the visual half of the Kozyrev legend: low light + a reflective surface + time = the brain filling in.

2. Methods similar to the Kozyrev effect [B/C]

- **Floatation-REST** (Restricted Environmental Stimulation): in a clinical sample spanning PTSD, GAD, panic and depression, one float produced a very large drop in state anxiety (Cohen's d > 2). A 12-session RCT for generalized anxiety held gains at 6 months. Canada's health-technology agency calls the evidence limited but positive. A newer registered trial, 'FLOAT for Healthcare PTSS' (NCT07710417), targets post-traumatic stress symptoms in healthcare workers (record details not retrievable this edition). **Grade B.**

- **'Aquahenosis' — a drug-free psychedelic-like state (Neuroscience of Consciousness, Aug 2026; newly catalogued).** Laureate Institute for Brain Research + Institute for Advanced Consciousness Studies (Khalsa, Feinstein, Reggente et al.): secondary analysis of a randomized feasibility trial in 75 adults with anxiety/depression (57 analyzed), six sessions of floating on a set schedule, floating on a self-chosen schedule, or a zero-gravity chair. On the 5D-ASC altered-states scale, floating raised Oceanic Boundlessness, Disembodiment and Unity, plus felt intensity of heartbeat and breath; effects were largest when people chose their own (often longer) sessions. Profiles overlapped psilocybin/ketamine on boundary-dissolution dimensions (cross-study, not head-to-head). Boundlessness statistically mediated gains in positive affect. Limits: exploratory, small arms, one retrospective rating, correlational mediation. **Grade C for the altered-state finding**; Float-REST overall stays B.
- **Dark retreats — multi-day darkness enters the lab (newly catalogued Nov 11).** Northwestern University + Institute for Advanced Consciousness Studies (Morris, Reggente, Paller et al.; conference poster, 2026) followed people through a 3-day retreat at Sky Cave (Oregon) with Oura ring sleep/HRV, Muse EEG, daily ECG for heart-evoked potentials, voice recordings and questionnaires, out to 6 months. Preliminary partial-sample results (n≈6 with physiology, ≈10 without; no statistics shown): longer sleep, more vigor, more willingness to disclose negative emotion — and **higher anxiety** afterward. A co-author is affiliated with the retreat center. Separately, a registered Polish pilot (NCT07429617; host 'Within' retreat, SWPS ethics) will put 20–30 adults through ~72 h of darkness with frequent vs. once-daily check-ins; primary outcome worry (PSWQ), plus completion, safety, HRV and go/no-go. **Grade D** (preliminary). Read with the Pisa review: duration and support level are the variables — the Polish design even tests support frequency directly.
- **The dose line for deprivation (Brain Sciences 16(2):122, Jan 23, 2026; newly catalogued).** University of Pisa narrative review (Marazziti et al.): outcomes depend on duration, whether it is voluntary, and the person. Short, chosen restriction (e.g., floating) may aid relaxation and emotion regulation; prolonged or forced deprivation acts as a chronic stressor (HPA-axis, sleep/circadian and cognitive effects) and can bring hallucinations, derealization and depersonalization — higher risk with trait anxiety, schizotypy or prior psychiatric history. Named gaps: almost no controlled human neurobiology of multisensory reduction, no standard duration thresholds, little longitudinal data. Narrative review, no meta-analysis — **context, not a grade change.**
- **Ganzfeld**: uniform visual field + steady noise; used in parapsychology and perception research. Reliably produces imagery; psi claims remain contested.
- **Psychomanteum** (mirror-gazing chamber, Raymond Moody): a dim room with an angled mirror used for grief work — the closest modern Western analog to the Kozyrev setup. Its lab-grade cousin is Caputo's mirror-gazing protocol (Section 1).
- **Whispering galleries / domes**: proven physics of curved-surface acoustics — the honest 'mechanism' story for curved chambers.

Training the heartbeat sense (Frontiers in Network Physiology, Jul 1, 2026; newly catalogued). Jena University Hospital: 25 adults completed 8 weeks of home HRV biofeedback (resonance breathing, then breathing in phase with a displayed heart curve). Heartbeat-counting accuracy rose 43% → 51% (d≈0.39, uncorrected); MAIA self-regulation rose (d≈0.83); breathing slowed, RSA and baroreflex sensitivity rose. No control group; physiology–interoception links did not survive correction. **Grade C/D. Heart-synced music (OSF preprint 2024, later PubMed-indexed; n=24, single session; newly catalogued):** only the group hearing music interactively coupled to their own cardiac signal improved interoceptive accuracy; all three groups (incl. plain music and heartbeat-attention) lowered heart rate and negative affect. **Grade D.** Together they say interoception is trainable and that feeding the body's own rhythm back through sound may sharpen it.

3. The Monroe Institute — audio & cognitive findings [C]

History. Robert Monroe patented a binaural-beat method (Hemi-Sync) and founded the Institute in Faber, Virginia. Its Focus levels (10, 12, 15, 21) map a progression from 'mind awake, body asleep' to expanded states. The Army's

1983 Gateway Process assessment and CIA reading-room bulletins document government interest; the Institute's own bulletins claimed thousands of sessions with relaxation and euphoria effects and no lasting adverse effects.

The science today. Binaural beats reliably trigger a brainstem frequency-following response, but whether they entrain the cortex is unsettled: a 2023 systematic review found 5 of 14 EEG studies supportive, 8 contradictory. A 2022 meta-analysis did find benefits for memory and attention. One fascinating footnote: a University of Virginia presentation reported EEG changes vanished when the electromagnetic headphones were replaced by air-tube headphones — an untested question worth a real experiment.

Newly catalogued. Frontiers in Neuroscience (Jan 8, 2026): 60 healthy adults randomized to 10 Hz, 14 Hz or 30 Hz binaural beats with 14-channel EEG and a digit-span test. Alpha (10 Hz) and gamma (30 Hz) groups showed tighter theta-band network clustering in fronto-parietal regions, and theta activity tracked working-memory gains; the 14 Hz group showed nothing comparable. No sham or silence arm, low-density EEG, correlational — **Grade C**. Better design is coming: Texas Tech Health Sciences Center is recruiting ~32 music majors for a randomized, **sham-controlled** (non-binaural music through identical headphones), masked trial of EEG-guided binaural audio for **pre-concert performance anxiety**, with fMRI inhibition and music-reading tasks (NCT07407426; started Apr 2026; completion est. Mar 2027). The first Monroe/Neuphoria registry entry (NCT07256665; Efforia, NYC; n≈100) is **single-arm, no sham**, wearable EEG plus perceived-stress and mindfulness scales over ~5 weeks; estimated completion was Aug 10, 2026 — no results posted as of Nov 5.

Deeper look (Nov 7) — what Monroe has actually published. A fresh sweep found no new Monroe or Neuphoria results (333 Study, NCT07256665, NCT07298369 all silent). The most detailed public write-up of the EEG **Discovery** program remains a 2019 Institute blog post: 13 participants, gamma-range 'SAM' audio exercises, Mind Mirror EEG; every participant showed raised gamma amplitude during the exercises and most reported mystical-scale scores ≥4, while hidden-target 'psi' hits were not statistically significant (18 of 60). Promotional source, no control group, no formal statistics — **Grade D**. Takeaway: Monroe has rich protocols and EEG infrastructure but almost no controlled, peer-reviewed outcome data. That is the gap a sham-controlled chamber partnership fills.

Matched-music control, blood pressure as outcome (Music and Medicine 18(4), Oct 31, 2026; newly catalogued). Kuvijitsuwan, Klaphajone et al. (Rehabilitation Medicine, Chiang Mai University): 28 highly stressed office workers (PSS-10 ≈ 26.5) heard two 15-minute web-delivered tracks in random order, 10-minute washout — music with superimposed binaural beats vs. the identical music without them. Systolic BP fell more with the beats (median –6 mmHg, IQR –11 to 11, vs 0 mmHg; p=0.024); diastolic BP, heart rate and HRV showed no difference; satisfaction 7.4/10. Limits: single session, small, short washout, wide spread, the abstract and metadata list different primary outcomes, and no funding/conflict statement was visible (full text paywalled). **Grade C/D.** Why it matters: this is the control design Monroe-style studies usually lack — same music, beats on vs. off — and it points to blood pressure, not EEG, as the cheaper outcome to watch. It also cuts against the Jan 2026 one-minute online result (beats did nothing for arousal): dose and context may matter.

Beats + personalized music vs. pink noise (International Journal of Psychophysiology, Oct 18, 2026; TMU release Oct 29; newly catalogued Nov 10). Toronto Metropolitan University randomized 83 undergraduates with at least one recent anxiety symptom to 24 minutes of music adapted to their starting mood with added auditory beat stimulation, or volume-matched pink noise. Salivary cortisol fell in both, but the drop 15 minutes later was more than twice as large with music; self-rated anxiety, mood and HRV improved **equally** in both arms; EEG activity tied to emotion regulation rose slightly after music. Limits: biomarker results sensitive to outlier handling, no music-without-beats arm (can't separate the two), student sample, co-funded by LUCID (a personalized-music company). **Grade C/D.** Read with the Chiang Mai BP study: the physiological edge of beat-laced music shows up in body markers (BP, cortisol) more than in self-report — which argues for measuring bodies, not just asking people.

What Monroe is doing right now

- **Discovery** — EEG-monitored residential research program (Mind Mirror system); a session ran Oct 25–31, 2026.
- Commissioned research (Aug 2026) comparing the neurophysiology of different audio-entrainment technologies.

- The **333 Study** with neurotech firm Neuphoria (launched Sept 2025) — a 333-person, IRB-overseen remote EEG study using at-home headsets with adapted Monroe protocols; early reports cite mid-alpha engagement. No results paper found yet. A follow-on registered study, 'Cracking Consciousness with Monroe/Neuphoria — Cohort 23' (NCT07298369, sponsor Efforia Inc.), is enrolling ~100 adults: open-label, single-group, wearable EEG plus stress and mindfulness scales. **No sham or control arm** — that is the gap a controlled chamber can fill.
- Collaborators: IONS and UVA's Division of Perceptual Studies. Monroe Sound Science now layers monaural, isochronic and modulation techniques — not just binaural.

4. Current sound / acoustic neuroscience [B/C]

40 Hz gamma stimulation (light + sound)

MIT's GENUS work: 40 Hz flicker and tones reduced amyloid and tau in mice. In humans, daily 40 Hz audiovisual stimulation proved safe for 30 months and slowed brain atrophy versus historical controls; a 2-year extension showed slower cognitive decline in late-onset patients and falling pTau217 in two. Cognito Therapeutics' HOPE Phase 3 (670 patients, 70 US sites, enrollment complete) will decide whether this becomes an FDA-cleared therapy. Caution: one mouse study failed to replicate, and consumer '40 Hz' products are not the trial device.

Immersive delivery (Sept 22, 2026). Clarity Health Technologies with UCSF Neuroscape (J. Prevention of Alzheimer's Disease, in press) delivered 40 Hz-modulated audiovisual content inside VR environments to 11 people with MCI/mild AD. Single session, sham-controlled: no serious adverse events, a strong 40 Hz EEG response vs. baseline and sham ($p<0.001$), and — exploratory — better recall of items learned during 40 Hz. **Grade C** for the immersive variant (n=11, one session). Separately, MIT is recruiting 150 healthy adults (NCT07496918) to compare light/sound GENUS with a **tactile** 40 Hz device.

Touch vs. light+sound (Scientific Reports, 2026; preprint Mar 2025; newly catalogued). University of Colorado Denver, 15 healthy adults, within-subject, 2-minute blocks, 16-channel dry EEG. A 40 Hz vibrotactile glove produced a 40 Hz response comparable to audiovisual stimulation (peaks ~4.8 dB at Fz vs ~5.3 dB at O2), but in frontal-central/sensorimotor areas rather than occipital; it raised left-frontal gamma connectivity afterward, while audiovisual lowered parietal-to-frontal beta coupling. The decisive difference was comfort: tolerance 8.8 vs 6.2 out of 10, estimated tolerable daily use ~68 vs ~12 minutes; 14 of 15 preferred touch (flicker caused blurred vision, the tone irritated). Limits: tiny, healthy, single session, glove frequency drifted 38–42 Hz, fixed order. **Grade C.** MIT's NCT07496918 is testing the same question in 150 people.

Deeper look (Nov 7) — the healthy-brain map of gamma stimulation (Biological Psychology 204:109211, online Feb 2, 2026; newly catalogued). Longo, Bolognini & Zapparoli (Univ. of Milano-Bicocca) systematically reviewed 22 studies (24 experiments) of visual, auditory and multisensory gamma stimulation in healthy adults. 13 of 14 visual experiments and all auditory and multisensory studies showed gamma responses; visual drove occipital-parietal cortex, sound reached fronto-temporal areas, and combined stimulation spread widest (one single-subject study reported a superadditive audiovisual effect). Practical details: high-contrast visible flicker gave the strongest response but **invisible flicker was better tolerated**; **red and heterochromatic flicker tended to outperform white**; some studies found **32–38 Hz** worked better than 40 Hz in parietal/frontal areas, especially in older adults; shorter click intervals strengthened auditory entrainment; one binaural-beat study saw responses fade after ~15 min. Limits: small single-session samples, only 5 of 22 measured after stimulation (effects generally did not persist), no meta-analysis, and steady-state responses may be evoked rather than true entrainment. **Grade C** for these design details; thread stays **B**.

Vibroacoustics — and the voice as a biomarker

Bone-conducted 40 Hz in older adults (Frontiers in Aging Neuroscience, Aug 8, 2025; newly catalogued Nov 9 — deeper look at vibroacoustics). Bae et al. (Korea Institute of Oriental Medicine with AriBio/Jangsoo, device makers): 30 healthy adults aged 55–85, double-blind, randomized to a head-worn transcranial vibroacoustic device at 20 Hz or 40 Hz (~30 dB, forehead/temples) daily for 8 weeks. Both arms improved CERAD-K memory scores

(+0.7–0.8); only 40 Hz lowered depression scores (CES-D –3.4, p=0.045) and raised gamma power vs 20 Hz (p=0.027); cortisol unchanged; mild side effects in 4/30. Limits: per-protocol n=23, **no inert sham** (20 Hz may not be a placebo), two EEG channels, uncorrected multiple comparisons, dosing described inconsistently, industry conflicts. **Grade C/D.** Fresh sweep found no new 2026 vibroacoustic RCTs; a Nov 3 vendor 'review of clinical research' is marketing, not science. Thread stays **C**.

Focused ultrasound — the consciousness probe

MIT published a 2026 roadmap for using transcranial focused ultrasound to test what brain regions actually generate conscious experience, and a Michigan group showed thalamic ultrasound shifts conscious perception. Mass General is testing it to wake patients with disorders of consciousness. Lab/clinic only — but it is acoustics, and it is where 'consciousness expansion' is becoming hard science.

2026 clinical signals. A single-arm trial (medRxiv preprint, May 2026; NCT04921683) gave one low-intensity sonication of the left central thalamus to 16 patients with chronic disorders of consciousness: responsiveness scores rose (CRS-R ~10.3 to 13.3), with a paradoxical drop in brain glucose metabolism the authors read as a thalamocortical 'reset.' No sham; one author consults for the device maker. A Chinese case report (Frontiers in Psychiatry, Feb 2026) described a minimally conscious patient emerging after 12 thalamic sessions, with a randomized sham trial now underway. **Grade C** — the sham-controlled trials are what matter.

Sound energy on the self-network (Frontiers in Psychiatry, Jan 2026). University of Arizona open-label pilot: 20 adults with major depression received up to 11 ten-minute transcranial focused-ultrasound sessions aimed at the left anterior medial prefrontal cortex, a default-mode-network hub. Resting-state fMRI showed weaker mPFC–posterior cingulate coupling in 15 of 18; depression and repetitive negative thinking fell; no serious adverse events. But connectivity change did not track symptom change, and there was no sham. **Grade C.** Why it matters: this is the same DMN-loosening signature credited for psychedelic effects, produced acoustically and without a drug. A sham-controlled trial (NCT06320028) is registered.

Out of the scanner. UT Austin (Molecular Psychiatry, 2025): low-intensity ultrasound to the left amygdala lowered amygdala reactivity vs. sham in a double-blind target-engagement phase; an open-label 15-session course in 25 patients with mood, anxiety and trauma disorders (incl. PTSD) cut distress (d=0.77) with no serious adverse events — the clinical arm had no sham. UCSF (Oct 30, 2026) opened MESSI-LEO (NCT07710989): randomized sham-controlled crossover of a wearable 128-element ultrasound headband (Attune ATTN201) for schizophrenia hallucinations, after a 3-patient pilot with >50% symptom drops. **Grade C** (amygdala) / **D** (n=3 pilot). Trend: ultrasound is becoming a headset — the same form factor as EEG and audio.

First blinded win + the 'modulator' insight. NYU Langone (npj Acoustics, Oct 20, 2026; NCT05643196): 10 adults with medication-resistant schizophrenia/schizoaffective disorder got one real and one sham 10-minute session (30 s on/off) aimed at the globus pallidus interna, a week apart, double-blind. Delusion scores fell ~1.2 points after real vs. rose ~0.4 after sham, lasting the one-week follow-up; side effects mild and similar in both arms. Modest, single-session, n=10 — **Grade C**. Carnegie Mellon (Nature Communications, Mar 2026; n=27, concurrent EEG): low-intensity ultrasound alone gave no clear targeted response, but paired with mild transcranial electrical stimulation (tEAS) it produced strong, specific activity — the authors call ultrasound a gentle modulator. **Grade C** (mechanism, no clinical outcome).

Reality checks (newly catalogued Nov 5). A meta-analysis in Neurological Sciences (online Apr 15, 2026; 3 RCTs, n=84) found transcranial ultrasound vs. sham did **not** significantly improve global cognition in Alzheimer's (SMD 0.31, p=0.54); unfocused low-intensity pulsed ultrasound looked better than focused transcranial pulse stimulation in a subgroup split — too few trials to trust. A Frontiers in Psychiatry narrative review of ultrasound for schizophrenia (Jul 6, 2026) counts only three clinical studies (3–32 patients), notes that the clicking/bone-conducted sound of ultrasound can **break blinding**, and found no published negative studies — a publication-bias warning. Net: thread stays **C**.

More reality checks (newly catalogued Nov 9). Taipei Veterans General Hospital (Epilepsia, online Aug 28, 2026; NCT04999046; NaviFUS-funded): randomized, sham-controlled crossover in 12 adults with drug-resistant epilepsy

— safe, no serious adverse events, but the primary crossover analysis showed **no significant antiseizure effect**. A 2026 scoping review of psychiatric ultrasound (Prasad et al., J Neural Transm; 14 studies: 9 depression, 1 GAD, 1 OCD, 2 addiction, 1 schizophrenia) counts roughly three sham-controlled RCTs, flags inconsistent reporting of acoustic parameters, short follow-up and two serious adverse events in one study — and **no PTSD study exists yet**. Thread stays **C**. Read: sham-controlled ultrasound is now producing honest nulls, which is what a real field looks like.

Critical review (Frontiers in Neuroscience 20, published Nov 10, 2026; online Oct 29; newly catalogued). Liu … Yang (Aviation General Hospital and Tiantan Hospital, Beijing): narrative, non-PRISMA review of low-intensity focused ultrasound through Jun 30, 2026. Target engagement in deep structures (thalamus, amygdala, GPi, accumbens) is real, but physiological readouts do not establish clinical benefit; most clinical studies have n<30; a registry analysis found only **~37% of 177 completed LIFU trials linked to a peer-reviewed paper** (publication-bias warning); and a multi-site study (Kop et al., 2024) suggested some reported inhibitory effects were **driven by the audible pulse**, not the ultrasound. No grade change; thread stays **C**. Reinforces the acoustic-confound/sham-masking side lane.

Music therapy in the military

Creative Forces (NEA + DoD + VA) places credentialed music and art therapists in military hospitals for TBI and PTSD, with telehealth for rural vets. Government already pays for sound-based care.

6. Holistic healing — meditation [A-]

The strongest non-drug evidence in this whole catalog: a DoD-funded RCT at the San Diego VA (Lancet Psychiatry, 2018; 203 veterans, mostly combat trauma) found Transcendental Meditation **non-inferior to prolonged exposure therapy** — the gold-standard PTSD treatment — and both beat health education. A Northwell RCT found 50% of meditating veterans no longer met PTSD criteria at 3 months vs. 10% of controls. A 450-veteran Phase 3 across nine VA/academic sites is underway.

Newly catalogued. A 2025 systematic review and meta-analysis (Medicina 61:659; 15 studies, >1,200 participants across veterans, nurses, refugees, survivors of violence and disaster) reported a large pooled effect (~1.0) for TM vs. controls. Caution: the authors are affiliated with TM institutions and many included studies are small. A 2026 uncontrolled pilot (J Clin Psychol, doi 10.1002/jclp.70172) taught TM to 39 Israeli civilians evacuated after Oct 7, 2023: PTSD (PCL-5), depression, anxiety and insomnia all fell significantly over 8 weeks; the authors call for RCTs. Grade for the thread stays **A-** — the anchor is still the Lancet Psychiatry RCT; these add breadth, not rigor.

Key insight: TM is **non-trauma-focused** — no reliving the worst day. That's why many veterans stick with it. A quiet, beautiful, acoustically perfect room built for meditation is not a gimmick; it's infrastructure for an A-grade intervention.

7. Handpans & resonant instruments for the campus [C]

The handpan (invented in 2000 by PANArt in Bern) has a long, harmonically rich decay and is usually played slowly — features that plausibly slow breathing and heart rate. Direct research is nearly nonexistent: one registered trial is testing recorded handpan music for anxiety in pregnancy. Most online 'handpan neuroscience' is maker marketing. That gap is our opening.

First handpan paper in a clinical journal. 'Music therapists' lived experiences of using the Handpan in clinical practice: an interpretative phenomenological analysis' (The Arts in Psychotherapy, 2026). Qualitative interviews with therapists — it documents how clinicians use the instrument, not whether it changes outcomes (full text not retrievable; sample size unverified). **Grade D** for outcomes. It confirms handpans are entering clinical practice while the physiology remains unmeasured — the gap our HRV study fills.

Bowl vs. beats (Music and Medicine, 2026). SRH Berlin randomized 92 people online to one minute of singing bowl, binaural beats, pink noise or silence. Only the bowl lowered self-rated arousal; mood scores didn't move in any

arm. Tiny dose, self-report only — but it is a head-to-head that favors a real resonant instrument over an entrainment track.

Deeper look this week (Nov 5) — the evidence ceiling. The most recent synthesis remains the 2025 systematic review in Integrative Medicine Research (Cai et al.; 19 clinical studies, 9 randomized): singing bowls 'may have potential' for anxiety, depression, sleep and cognition, but studies are small and heterogeneous. A fresh sweep found **no new 2026 randomized trials** of bowls, sound baths or handpans, and still **no handpan physiology study** of any kind. Consumer-health explainers in late Oct 2026 are recycling the same small studies. Grade stays **C**; the gap is unchanged — and still ours to fill.

- **Handpans** — playable by beginners in minutes; outdoor-tolerant models exist (keep covered).
- **Tibetan & crystal bowls** — the one instrument with RCTs behind it (single session: higher HRV, lower anxiety than muscle relaxation; one-minute clip beat binaural beats on arousal).
- **Monochord / sound table** — a lie-on vibroacoustic bed; the monochord outperformed muscle relaxation on anxiety in an earlier study.
- **Gongs, frame drums, tongue drums, wind chimes, didgeridoo** — group work and outdoor installations.
- **Measure everything**: cheap HRV straps and consumer EEG headbands turn a sound garden into a data-producing field site. Add a before/after voice recording — free, and now has a published method behind it.

8. Consciousness expansion — the map

- Pharmacological: psychedelics (DMN disruption, plasticity).
- Contemplative: meditation (TM, mindfulness, Zen) — trainable, durable, legal.
- Acoustic: entrainment (binaural, monaural, isochronic, 40 Hz), drumming, chanting, vibroacoustics.
- Environmental: sensory reduction (float, dark/silent chambers, Ganzfeld, mirror chambers). Floating now has a measured psychedelic-like signature ('aquahenosis', 2026) on the same 5D-ASC scale used in psilocybin research. Mirror-gazing reliably produces face illusions and mild dissociation in minutes.
- Technological: neurofeedback, focused ultrasound, TMS, immersive VR delivery.
- The frontier is **stacking** the legal ones and measuring the result — nobody has rigorously tested sensory reduction + focused acoustics + entrainment together. Support for the logic: CMU (2026) found ultrasound weak alone but strong when paired with a second stimulus.

10. Benefit to humanity & wellness

- Drug-free, low-risk options for people who won't or can't do drug or exposure therapy.
- Integration infrastructure: if MDMA/psilocybin are approved, clinics will need calm, well-designed spaces for preparation and integration — VA already says first-year capacity will fall far short of demand.
- Dementia prevention research (40 Hz) delivered in a community setting.

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