



INAUDIBLE IS NOT INCONSEQUENTIAL: INFRASONIC EXPOSURE, SALIVARY CORTISOL, AND THE END OF THE "I HEARD NO DIFFERENCE" DEFENCE IN CRITICAL LISTENING



Inaudible Is Not Inconsequential: Infrasonic Exposure, Salivary Cortisol, and the End of the "I Heard No Difference" Defence in Critical Listening

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Abstract

The central instrument of audiophile scepticism is the blind listening test, and its central conclusion is a single sentence: I heard no difference. In April 2026, Scatterty and colleagues reported in Frontiers in Behavioral Neuroscience a randomised, researcher-blind study in which 36 participants listened to music with or without approximately 18 Hz infrasound at 75-78 dB. Participants did not detect the infrasound above chance ($p = 0.241$). When it was present, they nevertheless rated the music as sadder and less interesting, reported more irritability, and showed a greater rise in salivary cortisol ($p = 0.022$). Whether they believed infrasound was present did not predict their cortisol response.

The committee regards this as the most consequential result for critical listening since the adoption of the blind test itself. A listener can fail to detect a stimulus and still be measurably affected by it. "I heard no difference" is a statement about detection. It is not a statement about the listening session.

We report a survey of 52 domestic listening rooms in which infrasonic sources, principally HVAC plant, refrigeration, road traffic, ported loudspeaker enclosures, and floor-coupled rack resonance, were identified in 49. In a follow-up study of 48 listeners in 12 of those rooms, participants could not identify when the source components and cable runs had been mechanically isolated (25 of 48 correct, $p = 0.89$), yet their pre-to-post-session rise in salivary cortisol was 34% smaller in the isolated condition ($p = 0.006$). We propose the Unheard Stress Index as a mandatory companion to conventional blind-test outcomes.

1. INTRODUCTION

The blind listening test occupies a special place in audio. It is the method by which extraordinary claims are tested, and it has earned that place honestly. Remove the listener's knowledge of what is playing, and what remains is what the listener can actually detect.

The committee has never objected to the blind test. We have objected to what is done with its result. A listener who cannot distinguish two conditions reports, accurately, that they heard no difference. The sceptical literature then converts that report into a second and much larger claim: that there was no difference to the listener. These are not the same claim. Until 2026, there was little direct evidence with which to separate them.

In April 2026, Scatterty, VonStein, Prichard, Franczak, Hamilton, and Schmaltz published that evidence. Their participants could not tell whether infrasound was present. Their participants' bodies could.

This paper summarises that study, reports the committee's own measurements of infrasound in domestic listening rooms, and presents a controlled panel study of what happens to listeners when the sources of that infrasound are isolated from the playback system. The listeners noticed nothing. Their saliva did.

2. THE 2026 STUDY

Scatterty et al. (2026) used a 2 x 2 between-subjects design crossing music type (a calming, meditation-style clip or an unsettling, horror-themed ambient clip) with infrasound (on or off), with nine participants per group. Participants were undergraduate students at MacEwan University in Edmonton, Canada. The researcher interacting with participants was blind to both the music and the infrasound condition.

The infrasound, at approximately 18 Hz and 75-78 dB, was produced for 4 minutes and 40 seconds by two subwoofers positioned outside and between the testing rooms. The music was played through consumer-grade computer speakers and high-pass filtered to remove unintended content in the infrasonic range. Saliva samples were collected before and after exposure, participants completed affect ratings, and each participant was asked whether they believed infrasound had been present.

Participants did not detect infrasound above chance ($p = 0.241$). Infrasound exposure was nonetheless associated with lower reported interest, music rated as less interesting and as sadder ($p = 0.002$ for sadness), greater irritability during exposure, and a larger increase in salivary cortisol ($p = 0.022$). Participants' belief that infrasound was present showed no association with cortisol change ($p = 0.891$).

The authors are candid about the limitations: a small sample of 36 participants, one of whom was excluded from the cortisol analysis; a convenience sample of young adults, predominantly female; a single infrasonic frequency; and cortisol sampled from



saliva rather than blood or urine. The committee shares these reservations and records them here in full. We also note that the typical listening session is considerably longer than 4 minutes and 40 seconds.

3. INFRASOUND AND THE LISTENING ROOM

Infrasound is conventionally defined as sound below 20 Hz, and it is conventionally described as inaudible. The second description is an oversimplification. Møller and Pedersen (2004) reviewed hearing at low and infrasonic frequencies and showed that sound below 20 Hz remains audible at sufficiently high levels, and Leventhall (2007) notes that the hearing threshold has been measured down to 1.5 Hz. Infrasound is not silent. It is quiet, and the quieter it is, the more easily it is dismissed.

The literature has also long associated infrasound with unease. Tandy and Lawrence (1998) traced a laboratory's reports of discomfort and apparitions to a 19 Hz standing wave produced by a newly installed extractor fan. The sceptical rejoinder, which the committee respects, comes from Crichton et al. (2014), whose sham-controlled, double-blind provocation study showed that expectation alone can produce symptom reports attributed to infrasound. The significance of the 2026 study is that it measured a hormone rather than a complaint, and found that expectation did not account for it.

A domestic listening room is an unusually rich infrasonic environment. HVAC compressors and air handlers, refrigerator compressors, road traffic, and washing machines all radiate below 20 Hz. Ported loudspeaker enclosures generate turbulence at the port. Equipment racks and suspended floors resonate at low frequencies and couple that motion into every component and cable resting on them. The committee's earlier work on seismo-acoustic coupling (Ohm, Ferro, Tanaka, Solder, 2026) documented floor-borne excitation of the signal chain between 0.5 and 5 Hz. Established listening-room guidance (Park, Ferro, Solder, 2025) has addressed placement and stability, but not, until now, the listener's endocrine system.

4. METHODOLOGY

Survey. We measured 52 domestic listening rooms in nine countries. At the listening position and at each equipment rack, sound pressure was recorded from 1 Hz to 20 Hz with an infrasound-capable measurement microphone and G-weighted per ISO 7196, and floor and rack acceleration were recorded with triaxial accelerometers. Each room was measured continuously for 24 hours to capture HVAC cycling, refrigeration, traffic, and household activity. Sources were identified by coherence between the acoustic record and dedicated sensors placed on candidate sources.

Panel study. Twelve rooms were selected from the survey, with four listeners per room, for 48 listeners in total. Each listener completed two 40-minute sessions of the same programme material at the same playback level, on different days at the same time of day. In one session the system was in its normal state. In the other, the source components, amplifiers, and all interconnect, speaker, and power cable runs were mechanically isolated: Equatorial Elevation Blocks in 5N-graded teak (Bosque, Ferro, Park, Tanaka, 2026) under every cable run, the Equatorial Isolation Plinth under turntables where present, Directional Felt Isolation Pads under source components, and, for completeness, the Volume Knob Isolation Chamber. Isolation hardware was concealed beneath acoustically transparent drapes in both conditions. Session order was counterbalanced, and neither listeners nor session staff knew which condition was in place.

Saliva samples were collected immediately before and 20 minutes after each session. After the second session, each listener was asked to identify which session had used the isolated system and to state whether they had noticed any difference between the sessions.

5. RESULTS

Survey. Infrasonic sources were identified in 49 of the 52 rooms. The most common were HVAC plant (31 rooms), floor-coupled rack resonance (27 rooms), refrigeration (22 rooms), road traffic (18 rooms), and ported loudspeaker enclosures (14 rooms); most rooms had more than one. Dominant components fell between 8 Hz and 19 Hz. The three rooms without identified sources were built on ground-floor concrete slabs, had no forced-air HVAC, and used sealed-box loudspeakers.

Panel study. Listeners did not identify the isolated session above chance: 25 of 48 identified it correctly ($p = 0.89$). Forty-one of the 48 reported noticing no difference between the sessions.

Their saliva did not agree. The mean pre-to-post-session rise in salivary cortisol was 34% smaller in the isolated session than in the normal session (paired Wilcoxon signed-rank test, $p = 0.006$). Programme material was rated as less sad in the isolated session ($p = 0.02$). The effect was present in 11 of the 12 rooms and was largest in the rooms with the highest surveyed rack resonance.

The measured reduction in G-weighted infrasound at the listening position was modest, with a median of 2.1 dB. The reduction in cortisol was not modest. The committee interprets this discrepancy as evidence that the relevant exposure is not only the airborne infrasound reaching the listener but also the low-frequency motion of the signal chain itself, which the listener cannot hear and the playback system faithfully reproduces.



6. DISCUSSION

The blind test in this study was conducted correctly, and it reached the correct conclusion about detection. It reached no conclusion about anything else. That is not a flaw in the blind test. It is a flaw in what has been claimed on its behalf.

The committee anticipates three objections. The first is sample size: our panel, like the 2026 study, is small, and replication is required. We agree and are recruiting. The second is expectancy: Crichton et al. (2014) showed that expectation can generate symptoms. Our listeners did not know which condition was in place, and their reports of noticing a difference did not predict their cortisol response. The third is dose: the infrasound levels measured in most domestic rooms were lower than the 75-78 dB used by Scatterty et al. This is true. Domestic exposure is also chronic, repeated night after night, and accompanied by music the listener has chosen specifically for its emotional effect.

We propose the Unheard Stress Index (USI): the difference in pre-to-post-session cortisol rise between a system's normal and isolated conditions, expressed as a percentage. The USI is intended to be reported alongside the result of any blind comparison of audio components. A comparison that reports "no audible difference" without a USI has reported half of an experiment.

We note, finally, that isolation hardware is often dismissed on the grounds that its effects cannot be heard. This paper does not dispute that. It disputes the relevance.

7. CONCLUSIONS

Scatterty et al. (2026) demonstrated that people can be exposed to a stimulus they cannot detect and still show a measurable stress response to it. Our survey shows that such stimuli are present in almost every domestic listening room. Our panel study shows that mechanical isolation of the playback system reduces that response even when listeners cannot tell that anything has changed.

We recommend that critical listening rooms be surveyed for infrasound with G-weighted measurement, that cable runs be lifted from floors and source components isolated from racks, and that any published blind comparison of audio equipment report the Unheard Stress Index alongside its detection result.

"I heard no difference" remains a perfectly accurate sentence. It has simply stopped being an argument. The ears are not the only organ in the listening chair.

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