AUDITORY THRESHOLDS IN ADVANCED PARTICIPANTS IN THE TRANSCENDENTAL MEDITATION PROGRAM

GEOFFREY CLEMENTS, PH.D., and STEPHEN L. MILSTEIN, PH.D.

Department of Experimental Psychology,
Centre for the Study of Higher States of Consciousness,
Maharishi European Research University, Weggis, Switzerland

Institut National de la Recherche Scientifique,
Centre de Recherche en Sciences de la Santé,
Université du Québec, Montréal—Gamelin, Québec, Canada

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Unusually acute hearing was found in participants in the TM sidhi program. Further increases in sensitivity of hearing were found immediately following performance of the sidhi to enhance hearing ability to its full potential.—EDITORS

In a study on participants in an advanced Age of Enlightenment Governor Training Course at MERU, unusually sensitive hearing thresholds were found (11.7 dB more sensitive than norms averaged over the frequency range 250 Hz to 8000 Hz). Thresholds decreased by a further 3.0 dB after 15 minutes of performing the sidhi designed to produce unusually acute hearing. These results are discussed in relation to the high EEG coherence found during the TM technique and the TM sidhi procedures; and in relation to reversal of the aging process, indications of which have also been found in other findings on the TM program.

INTRODUCTION

The absolute hearing thresholds to pure sine wave tones from 250 Hz to 8000 Hz were determined for eight female subjects participating in an advanced six-month residential course in the Transcendental Meditation program. In addition to practicing the TM technique, certain ancillary procedures had been practiced by the subjects. These techniques, traditionally known as "sidhis," and specified in the Yoga Sutras of Patanjali (2), each have the aim of producing a development in a specific aspect of mind-body coordination. Taken as a set they have the aim of developing all aspects of mind-body coordination and producing a highly developed state of mental and physical integration.

This pilot study was designed to test the short-term and cumulative effects of one aspect of this program in selected participants who reported subjective success with the sidhi which has the specific intention of enhancing hearing far beyond its usual range of sensitivity. The subjects in this study had been performing a number of sidhi procedures, including specific procedures to enhance the capabilities of all the senses. This study measured auditory function only, although other studies in progress at MERU are investigating the effects of the sidhis on other sensory modalities.

In his interpretation of the Yoga Sutras of Patanjali (2), Maharishi Mahesh Yogi has explained that the sidhis are not to be regarded as "supernormal" abilities, but that they are the unfoldment of normal human abilities (7). This interpretation is supported by the nature of the sidhi techniques themselves, which are simple, effortless mental procedures applied in the settled state of awareness — transcendental consciousness — produced by the Transcendental Meditation technique.

The central hypothesis of this experiment was that the regular performance of the sidhi to enhance hearing would produce both short-term and cumulative enhancement of auditory acuity. The appearance of short-term enhancement in acuity, occurring after a few minutes of effortless sidhi practice, reinforced by a cumulative development of hearing ability, would give experimental support to the central theme, expressed above, that the sidhis represent the unfolding of latent abilities.

METHOD

SUBJECTS — The subjects were eight females, ages 23–30, who were on the point of completing two consecutive fully-residential advanced courses in the TM program. For a period of approximately eight months prior to the experiments the subjects had been performing the procedures known as "sidhis."
EQUIPMENT—A Grason Stadler Model 1702 Audiometer was employed using its automatic (von-Bekesy) mode of pure tone presentation for 10 pure tones ranging from 250 Hz to 8000 Hz. The subjects were seated in a soundproof cubicle in a separate room, and the tones presented monaurally through headphones. From pilot tests it had been determined that a 20 dB attenuator in the headphone circuit was necessary to disallow the subjects' responses from exceeding the sensitivity of the audiometer.

PROCEDURE—The absolute thresholds to pure tones ranging from 250 Hz to 8000 Hz were determined before and directly after a 20 minute period consisting of 5 minutes of the TM technique followed by 15 minutes of performing the sidhi to enhance hearing ability. All experiments were conducted between the hours of 14.00 and 16.30.

RESULTS

For the initial measurement period, inspection of the data indicated a significant lowering of the absolute threshold of hearing averaged over all subjects at all frequencies, compared with the norm provided in the 1964 ISO standards; the increase in sensitivity averaged over all frequencies being 11.7 dB. A further increase in sensitivity of 3.0 dB was noted for the second measurement, after the 15 minutes of sidhi performance. The values at each frequency, averaged over all subjects, are shown in Fig. 1. To eliminate the possibility that the short-term increase is due to a practice effect, additional subjects are now being tested in a further controlled study.

DISCUSSION

The initial data in this pilot study suggest that participants in advanced courses in the Transcendental Meditation program develop hearing thresholds much more sensitive than norms. Most pronounced is the low initial threshold at all frequencies, demonstrating the cumulative effects of this advanced course in the TM program. The smaller but consistent improvement in auditory thresholds immediately following the performance of the sidhi to enhance hearing ability supports the subjective reports of the subjects that hearing was enhanced during and immediately following performance of the sidhi. One subject wrote “the testing is great — very satisfying — I can subjectively feel sensitive changes induced by this sidhi — it is very gratifying.” (This subject showed a pre- to posttest improvement from 10.5 dB to 15.0 dB more sensitive than normals). Another subject reported that the experiment was “very much easier, and very blissful, after the sidhi performance” and that there were “deep experiences within the unmanifest during the experiment the second time.” The pre- to posttest im-

FIG. 1. ENHANCED HEARING SENSITIVITY IN ADVANCED PARTICIPANTS IN THE TRANSCENDENTAL MEDITATION PROGRAM. The absolute threshold of hearing at frequencies from 250 Hz to 8000 Hz was determined using a standard von Bekesy technique for eight female students (ages 23–30) participating in an advanced Age of Enlightenment Governor Training Course at MERU. The subjects displayed unusually sensitive hearing thresholds (11.7 dB more sensitive than norms averaged over all frequencies). After 15 minutes of performing the TM-Sidhi technique to enhance hearing ability, hearing became even more acute by a further 3.0 dB.

provement in this case was from 4.5 dB to 15.4 dB more sensitive than norms. (These and other experience reports were elicited using a standard questionnaire immediately after the posttest.)

The subjective reports in this case indicate that the measured short-term increase in sensitivity is not due to a practice effect, but is real phenemenon involving a change in cortical processing.

During performance of the sidhi itself, a common report is that beautiful sounds are heard. Afterwards, the predominant experience is that hearing is very clear; many new aspects of sound are heard that were not experienced before, and all sounds are experienced as being more beautiful. This was expressed by one subject in the words: “Everything is clear and beautiful, and I hear many beautiful sounds that I never used to hear.” Other subjects wrote that “Hearing is becoming much more acute — much fuller and very sweet and blissful.” “All senses are even more refined; not necessarily just sharper, but fuller with intuition and knowledge of greater depth.”

Other subjective reports indicate that the practice of this sidhi makes the individual “more sensitive to the vibrational qualities making up objects, hearing is more refined and sensitive to the subtest vibrations, with an
experience of feeling, almost seeing, the vibrations in the awareness.” This experience was further defined by another subject in these words: “Perception is much clearer; it seems that I am perceiving more the different vibrations of sound in consciousness — as if perceiving with consciousness.”

Present knowledge of the functioning of the central nervous system and of the peripheral hearing structure would lead us to the conclusion that the improvements in hearing ability seen in this study are centrally rather than peripherally mediated. This conclusion is supported by the reports of the subjects and also by the findings of electroencephalographic (EEG) studies on the TM technique and on the TM sidhi program.

Subjectively, the predominant effect noted by all the subjects was that of an experience of “inner quietness” or “inner stillness” that allowed them to perceive the outer sounds more effectively, in the same way that a reduction in outer ambient noise allows for a reduction in auditory threshold. It would appear from these subjective reports that there is a reduction of noise within the neural pathways from the inner ear to the brain, and within the auditory cortex itself. This is certainly entirely consistent with EEG findings. A major EEG correlate of the TM technique and of the TM sidhi practices is high EEG coherence between the signals derived from two spatially separated locations on the scalp (6, 9). High coherence, which is mathematically defined in terms of high stability of the phase relationship between two signals at each frequency, is understood to be related to the efficiency of information transfer between two cortical areas and is therefore indicative of low noise levels within the cortex. (See Orme-Johnson et al. [9] for further discussion of this point.)

The production of high EEG coherence during the TM technique and the TM sidhi procedures must therefore be an important factor not only in auditory sensitivity but in other sensory modalities, especially since there are strong indications that with continued practice, EEG coherence persists after periods of the TM technique (3).

It will be of interest to determine how far this reduction of internal noise can be extended with benefit to hearing thresholds, since hearing is known to be already close to its thermodynamic limit with respect to the collisions of air molecules with the tympanic membrane (3).

The possibility of increasing auditory sensitivity to a level approaching the energies involved in thermodynamic processes in the air would involve near zero noise levels in signal processing, and strongly supports the suggestion made by Domash (5) that the coherent functioning of the brain found during the TM technique is essentially a macroscopic quantum coherence phenomenon. This in turn supports Maharishi’s suggestion of a link between the state of transcendental consciousness and the state of least excitation of a quantum field.

Von Bekesy (3) notes that the decline in elasticity of the inner ear as well as nerve deterioration and loss of central processing performance leads to a steady loss in hearing ability with advancing age. This loss includes a decrease in frequency range as well as a loss in sensitivity at all frequencies. The present finding indicates a reversal of this trend and confirms other results suggesting that the TM technique retards or even reverses aspects of the aging process. Other findings in this direction include: reduced blood pressure (4), faster reaction time (1), improvements in cardiovascular and respiratory efficiency (11), improved exercise tolerance in patients with angina pectoris (14), and decreased behavioral rigidity (10); all of these factors having known correlations with the aging process. In addition, the TM technique in known to lead to a greater efficiency and stability in metabolic functioning (8, 12), and to a normalization of body weight (13), indicating a tendency for reduced wear and tear on the system, and thus a tendency for decreased aging.

A controlled longitudinal study now in progress is designed to extend the findings of the present study by comparing the hearing thresholds of 20 subjects participating in a course equivalent to that undertaken by the subjects in this study with a matched group of subjects practicing the TM technique but not participating in an advanced course, and with a matched group of nonmeditating subjects.

In conclusion, since there is no reason to suggest that individuals enrolling in the TM program have initially atypical hearing thresholds, and since the subjects in this study had no prior experience with the test administered, the TM program and the TM sidhi procedures appear to have a marked benefit on hearing ability. This supports the thesis presented by Maharishi Mahesh Yogi that while the TM technique effects an overall improvement in neurophysiological integration, the sidhi practices develop specific channels of sensory and motor performance.

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