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DAVIS ADDENDUM TO THE "TOMATIS EFFECT"

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The Tomatis Method is based on the principles established by Dr. Alfred Tomatis. The relationship of the ear and voice is defined in his three laws, the "Tomatis Effect". Recent research with BioAcoustics, a new science, has given rise to 2 new laws that can be applied to the ear/voice connection. Through BioAcoustics, a time domain frequency analysis of the voice becomes a predictive, diagnostic, and preventive tool for wellness. The spontaneous otoacoustic emissions from the ear were evaluated and compared with a frequency analysis obtained through voice analysis. One hundred percent correlation between the stressed frequencies of the ear and voice was noted. From this research, an addendum of 2 new laws to the "Tomatis Effect"was suggested.

Over 50 years ago, Dr. Alfred Tomatis discovered the "Tomatis Effect", a set of 3 laws that identified a 'voice-ear-brain' connection. Specifically, these laws state:

Law 1:	The voice only contains the harmonics that the ear can hear.
Law 2:	If you give the possibility to the ear to correctly hear the distorted frequencies of sound that are not well heard, these are immediately and unconsciously restored into the voice.
Law 3:	The imposed audition sufficiently maintained over time results in permanently modifying the audition and phonation.

These laws were validated in 1957 at the French Academy of Sciences. The laws are the foundation for the Tomatis® Method, a method of sound presentation that impacts many developmental, emotional, and wellness issues.

This paper discusses relatively new information about sounds that the ear emits, called otoacoustic emissions, and, based on a comparative research project, propose the addition of two new laws to the Tomatis Effect. This connection was identified with the science of BioAcoustics™, a science created by Ms. Sharry Edwards, MA, that analyzes the distorted frequency patterns emitted by the voice and identifies specific wellness issues within each voice print.

Review of the Tomatis® Method

Dr. Tomatis used filtered and gated sounds to allow the ear to process sound differently.
The focus of the method is on the effects of high frequencies and their impact on the brain and body. Changes are evidenced in the overall functioning of the listener.

Otoacoustic Emissions

In 1978, Dr. David Kemp reported that the ear also emits sound called Otoacoustic Emissions (OAE's). The OAE's are sounds generated by the energy of the outer cochlear hair cells and can be detected when a microphone is placed within the external auditory canal. OAE's offer information about auditory functioning that would not be available from other sources.

There are three main types of OAE's: Distortion Product, Transient, and Spontaneous.(Hall, and Mueller, 1997) The Distortion Product and Transient forms have clinical applications for audiologists and physicians.

The third type, called Spontaneous Otoacoustic Emissions (SOAE), is the most relevant to the two new laws and BioAcoustics. The SOAE is recorded in the external ear canal and measures the sound output, or emissions of the ear. Very little research has been done with SOAE's because little is known as to what to do with the information.

BioAcoustics™

Shortly before Dr. Kemp's publication on his cochlear reflection hypothesis, Ms. Sharry Edwards was discovering that the 'sounds she was hearing' were Spontaneous Otoacoustic Emissions coming from the people around her. Her unique hearing abilities allowed her to hear the sounds that only carefully placed microphones and special recording instruments were able to detect. These "life sounds" represent the basis for what has become the science devoted to the study of the frequencies emanating from all living systems.

Ms. Edwards developed the field of BioAcoustics™. She found a way to capture the energy (frequency) patterns of people through a time domain frequency generated voiceprint. This voiceprint becomes a unique representation of the person at the time it is generated.

Therapy Connections

Certain connections in the basic concepts of both methods were identified. The Tomatis® Method utilizes high frequency sound, bone conduction stimulation, and voice stabilization for success. BioAcoustics™ uses the voice to identify stressed issues and entrains the brain through low frequency analog sound to make a change. The Tomatis® Method cortically re-energizes the brain and uses the voice to support change; and BioAcoustics™ uses the voice to identify the issues and then entrains the brain to make change. The two methods support each other in a continuous cycle.

Research Study

A research study explored the connection between the voice-ear-brain. With the knowledge that the voice produces what the ear hears (looking at vocal output and reception of sound at the ear, or Tomatis®) and, that the ear emits a sound (looking at vocal output and emission of sound at the ear, or BioAcoustics™), one could hypothesize that the connection between the ear and the voice would be the same whether it is in the reception or expression of sound.

Criteria for Exploratory Study

The following criteria was established for comparing voiceprint frequencies to SOAE's:

1. The Spontaneous Otoacoustic Emission must be measured on the same visit as the voiceprint and occur prior to the voiceprint.
2. Subjects will participate one time.
3. All study subjects must be 18 or older.
4. Equipment used will be the Madsen Capella 0301 with the Madsen eartips from box 8-66-950.
5. Three forms of OAE's will be tested.
6. Only SOAE's will be compared to the voiceprints.
7. SOAE frequencies will be divided into 2 categories: a) those under 1000 Hz, and b) those over 1000 Hz up to 10,000 Hz.
8. Left and right ears will be recorded separately.
9. All frequencies that are recorded as automatic SOAE's will be used.
10. All frequencies with noticeable peaks will be noted.
11. The first low "stringer" will be recorded.

12. The first high “riser” or peak will be recorded.
13. The Audiologist will record the SOAE’s as frequencies, specifically noting the BWM’s (Brain Wave Multiples: “A term used to describe cycles per second of frequency that fall between .05 and 30 cycles per second, the range identified as brain waves.” {Edwards, 1997}).
14. A BioAcoustician (certified by Sound Health Alternatives International, Inc.) will take the subject’s voice print (for spectral analysis) identifying and recording BWM’s using standardized BioAcoustics equipment and programs, as established by Sound Health, Inc.
15. Corresponding VP BWM’s will be included with differences up to .05.

Study Results

The study ran from 11/13/99 through 2/26/03 and included 50 adult subjects randomly selected from parents and clientele at the Davis Center. Data was obtained and recorded noting corresponding SOAE and voiceprint (VP) BWM's (Brain Wave Multiple) and entered into their appropriate number of "hits" categories of 0, 1, 2, 3, 4, or 5+. Results demonstrated that every subject (100%) demonstrated at least one corresponding SOAE and VP BWM. 76% had 5+ corresponding frequencies. 12% had 4 corresponding frequencies. 6% had 3 corresponding frequencies. 4% had 2 corresponding frequencies. 2% had 1 corresponding frequency. 88% had 4+ corresponding. (Insert Figure 1 and Figure 2)

Although this data is drawn from two different sources (SOAE's, and VP's), each was broken down into comparable Brain Wave Multiple (BWM) frequencies. Approximately 30 SOAE stressed frequencies out of 10,000 frequencies were identified for each subject. With the BioAcoustics’ VP, 24 stressed frequencies out of 100,000 were identified for each subject. These numbers were converted into Brain Wave Multiples (as defined in BioAcoustics standards) and compared. The Brain Wave Multiples of the 30 frequencies from the SOAE's and the Brain Wave Multiples of the 24 frequencies from the BioAcoustics voiceprint were compared. The number of "hits" represented the matching Brain Wave Multiples.

Conclusion

One hundred percent (100%) of all subjects tested demonstrated at least one matching SOAE with a VP BWM. The results allowed one to hypothesize that “The voice produces what the ear hears (Dr. Tomatis) and the ear emits the same stressed frequencies that are emitted by the voice. (Davis, 2002)”

Davis Addendum to the Tomatis Effect

With one hundred percent (100%) correlation, two new laws are suggested as an addition to Dr. Tomatis' laws.

New Law 1:	The ear emits the same stressed frequencies that are emitted by the voice.
New Law 2:	When complementary or supplementary frequencies of stressed frequencies are introduced via sound vibration to the ear, vocal patterns regain coherence.

These new laws lend further support to the voice-ear-brain connection, and encourage further research in this interpretation. They also enhance the connection between the Tomatis® Method and BioAcoustics™, further clarifying the cyclical pattern of how the body uses receptive and expressive sound.

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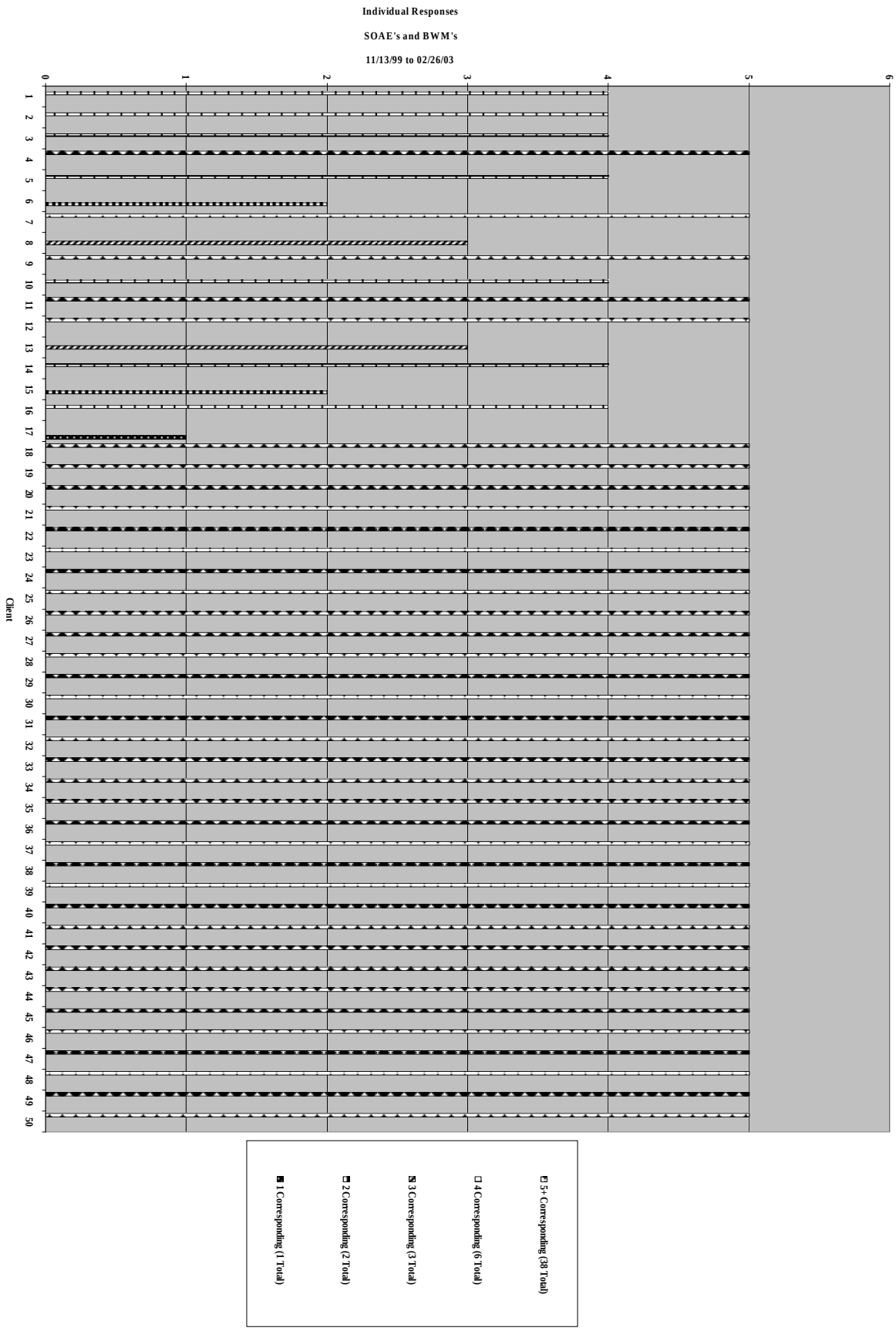
Individual Responses
SOAE's and BWM's
11/13/99 to 02/26/03
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1
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6
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41
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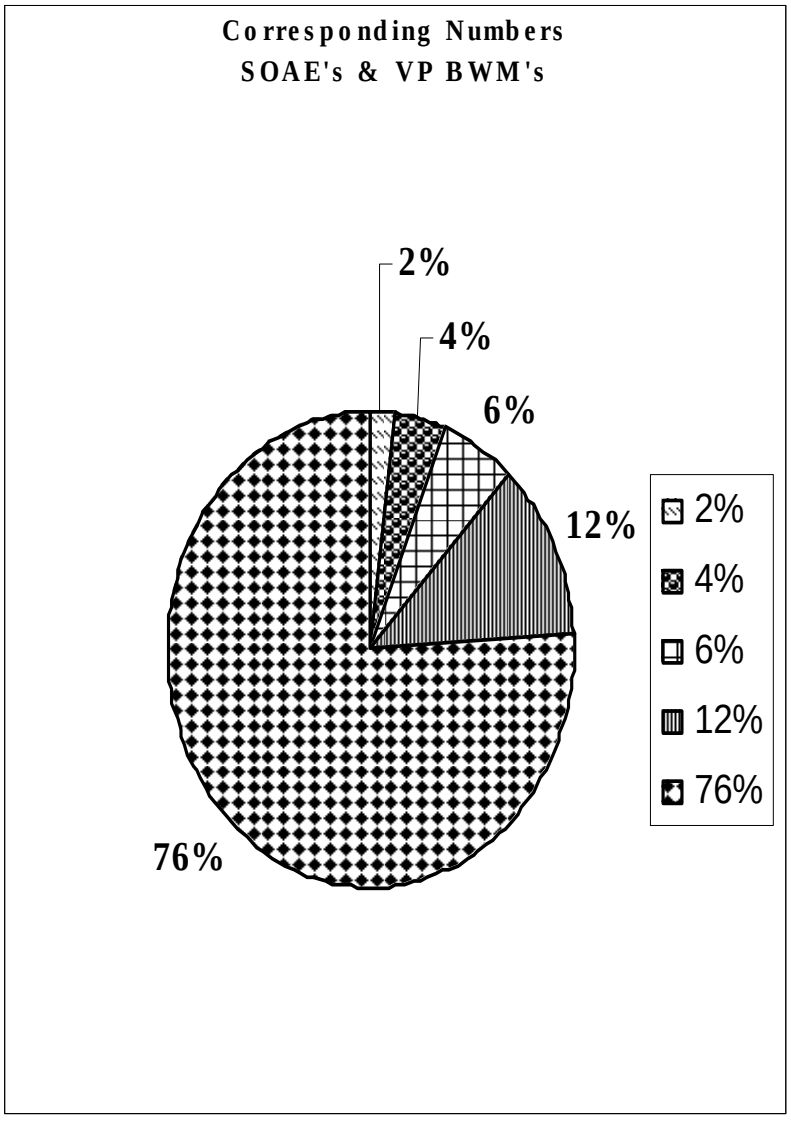
45
46
47
48
49
50
5+ Corresponding (38 Total)
4 Corresponding (6 Total)
3 Corresponding (3 Total)
2 Corresponding (2 Total)
1 Corresponding (1 Total)

Figure 1



2% 1 Corresponding
4% 2 Corresponding
6% 3 Corresponding
12% 4 Corresponding
76% 5+ Corresponding

Figure 2