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Introduction

This paper reviews the research done on the impact of the Tomatis Method of auditory stimulation. For an in-depth overview of the Tomatis Method, please see Pierre Sollier's: "Listening for Wellness" (Sollier, 2005).

The Tomatis Method of auditory stimulation utilizes music that has been electronically modulated by a device of Tomatis' design, called the Electronic Ear. The resulting sound is presented through headphones and vibrators. It has been emphasized that the Tomatis Electronic Ear has evolved over the years. In the early 70's bone conduction was introduced to more effectively stimulate the auditory pathways. Later-on, the extended precession was introduced. In the late 90's, new gating systems were introduced allowing to change both the slope and the pivot point of the scaling system. All these improvements helped to increase the success rate of the Tomatis Method.

The treatment modalities have also changed over the years, most notably using channel reversal when called for. Also, in the case of autism, the number of hours of listening to a recording of the mother's voice has increased significantly, improving the success rate to 80% (Vervoort, 2006).

The current theory is that Tomatis Method stimulates the myelination of the auditory pathways (Sacarin, 2009) which improves the

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Electronic Ear, an essential part of the Tomatis protocol?

- Does the program include listening to a recording of the Mothers Voice (if available) via the Electronic Ear, again an essential part of the Tomatis Method.

This review covers research done in the following areas:

- Auditory Processing Disorders
- Learning disabilities and Behavior Problems
- Attention Deficit Disorders
- Autism
- Learning Foreign Languages
- Voice
- Child Birth
- Stuttering
- Psychological Disorders

Auditory Processing Disorders

The current hypothesis is that auditory Processing Disorders are the root cause of many learning and behavior problems. Tomatis Auditory Stimulation is believed to stimulate the myelination of the auditory pathways and so improve the speed of processing of the auditory signals (Sacarin, 2009). To check this theory, **Ross-Swain** (The Swain Center, Santa Rosa, California) reviewed the pre / post treatment testing results of 41 randomly selected clients that had Auditory Processing Problems (Ross-Swain, 2007).

The subjects (18 females, 23 males) ranged in age from 4.3 years to 19.8 years (mean age of 12.1). All subjects received 90 hours of Tomatis auditory stimulation, and were not receiving any other therapy at the time. The effect of the treatment was

auditory cohesion) is the ability to process auditory information (Du Plessis, 1988). They received either higher-order level of functioning. The skills of Tomatis auditory stimulation, a necessary for listening comprehension, and the program or no treatment at all. The reasoning and problem solving. “Interpreting and Following Directions” is a skill that depends on personality, cognitive and family the auditory skills discussed above and listening aptitude. The test battery ability to comprehend, understanding and tests to assess anxiety: the CAS test auditory information well enough (Children’s Anxiety Scale, Gillis, 1980) and the direction. STAIC test (State-Trait Anxiety Inventory for Children, Spielberger *et al*, 1973). The results are

The TAPS results are given in Table 19. The shaded cells denoted column shows the pre / post percentile ratings. significant differences (95% Ratings between 37% and 68% denoted average level). performance. Scores falling below 37% is below average and scores above 68% are considered to be above average. Prior to the treatment, all subjects had below average scores. Upon completion of the Tomatis auditory stimulation, the scores were in the average range and thus, on average, the clients no longer had auditory processing problems. In addition, CAS significant reduction in auditory latency was also noted (63% to 39%).

| | Pre / Post Anxiety Scores | | |
|-------------|---------------------------|---------------|-------------|
| | Tomatis | Psychotherapy | Control |
| N | 10 | 9 | 10 |
| CAS | 9.6 / 7.6 | 11.0 / 11.3 | 8.4 / 7.7 |
| STAIC Trait | 42.8 / 32.9 | 41.2 / 37.1 | 37.2 / 37.6 |
| STAIC State | 32.8 / 27.6 | 30.7 / 28.1 | 31.3 / 30.0 |

Table 19: Du Plessis (1988) Study. Differences in the shaded cells are statistically significant.

| TAPS subtests | Pre / Post % |
|----------------------------------|--------------|
| Auditory Processing Overall | 8.4 / 58.3 |
| Auditory Discrimination | 14.2 / 68.1 |
| Auditory Memory, digits | 8.7 / 46.0 |
| Auditory Memory, digits reversed | 19.1 / 37.4 |
| Auditory Memory, words | 12.2 / 48.5 |
| Auditory Memory, sentences | 16.4 / 53.4 |
| Auditory Processing | 23.2 / 56.6 |
| Following Directions | 31.3 / 66.5 |

Table 1: Ross-Swain study: Pre/Post Percentile Ratings

The Token Test of Children, which measures a child’s ability to follow spoken directions, showed

Spaggiari, an Italian psychiatrist and Tomatis practitioner in Reggio Emilia (Italy), evaluated the impact of Tomatis Training on 409 people with

treating. An success rate treating learn given in ta reviewer).

| Disorder |
|-------------------------------------|
| Anorexia |
| Psychosoma |
| Anxieties Attacks |
| Obsessive Behavior |
| Bipolar Depressions Cyclotomia |
| Severe Depr |
| Schizophren without para |
| Personality (paranoia, and borderli |
| Neurological Cerebral Dis |
| Total |
| Table 20: Ther Failure |

a sensory motor stimulation program (Group A). The second group received music stimulation (without the Tomatis effect) plus the same sensory stimulation program (Group B) while the last group did not receive any treatment (Group C).

Psychological tests included the Bailey Scales of Infant Development. The results indicated that both experimental groups manifested an increase in mental age, but the increase in the Tomatis stimulation group (group A) was significantly higher than in group B. No change was found in the control group C.

Stuttering

Tomatis observed that stutterers showed a decreased acuity in the perception of the frequencies corresponding to the speech area (1,000 – 2,000 Hz). By improving the acuity to these frequencies, it seems that stuttering can be reduced. Tomatis also recognized the psychological component of the stuttering problem, making that auditory stimulation alone is unlikely to completely and permanently resolve the stuttering problem.

Two studies by **Van Jaarsveld** (University of Potchefstroom, South Africa) show that Tomatis training can reduce the severity of stuttering. For practical reasons, neither study contained a control group.

The first study tested the long-term impact of Tomatis training on 43 stutterers (Van Jaarsveld, 1973, 1974). According to people close to the test subjects, 82.5 % of the participants experienced significant symptom relief. Only 54% maintained their improvement for one year or more. Of note is that the program was cut short, and thus this study

| Rate of Reading (wpm) | 1.81 | 1.88 |
|----------------------------|------|------|
| Rate of Speaking (wpm) | 1.81 | 1.88 |
| Attitude Toward Stuttering | 2.5 | 1.7 |

Table 18: Van Jaarsveld Study:
Impact of Tomatis on the severity of stuttering

Psychological Disorders

One of the characteristics of Tomatis auditory stimulation is that it opens the ear, especially to high frequency sounds. Such sounds have an energizing effect, giving people the energy they need to deal with the psychological problems they face.

Several studies show a positive impact of Tomatis auditory stimulation on anxiety disorders. Du Plessis and Van Jaarsveld reported reductions in anxiety as a result of Tomatis auditory stimulation. Spaggiari reported a success rate of 72% in treating anxieties, both psychosomatic anxieties as well as anxieties with panic attacks. The success rate on other psychological disorders is about 50%. One study with weight preoccupied students was inconclusive as the intervention was scaled back to only 20 hours of Tomatis Therapy (Du Plessis, 2004).

Peché (University of Potchefstroom, South Africa) ran a pilot study to determine the effect of Tomatis treatment on 10 anxious female students (Van Jaarsveld, 1988). The results were positive and lead to more in-depth research by Du Plessis (undated).

Du Plessis (University of Potchefstroom, South Africa) studied the impact of Tomatis auditory stimulation on 20 anxious university students (Van Jaarsveld, 1988). Half of them received 30 hours

conducted. All except one showed positive effects. The Tomatis Method of auditory stimulation. When analyzing the data, mainly percent changes in the pre/post scores are reported, so as to correct for differences in the pretest scores between the test and control group. The data which are significant at a 95% or higher confidence level are labeled with an “s”.

Rourke et al (University of Windsor, Ontario, Canada) studied 25 learning disabled children from nine to fourteen years of age, following them over a period of one year (Rourke, 1982). Sixteen followed the Tomatis program and nine were assigned to the control group. The subjects were not randomly assigned but were balanced for initial IQ. Most of the subjects were enrolled in schools for children with learning disabilities or received supplementary special education or tutoring. The report did not mention the number of hours of auditory stimulation nor the length of the program. All subjects were assessed on a battery of standardized test, some administered at 3 months intervals, others just at the beginning of the research and after 1 year. The test battery included the Wechsler Intelligence Scale for Children (WISC, Wechsler, 1949), the Personality Inventory for Children (PIC, Wirt, 1977, which assesses the opinion of the parents on the child's behavior attitudes and family relationships), the Wide Range Achievement Test (WRAT, Jastak & Jastak, 1969), the Verbal Fluency Test (Strong, undated), the Oral Reading Test (Gates & McKillop, 1962) and the Grooved Pegboard Test (GPT, Klove, 1963, a measure of speed and accuracy of hand-eye coordination).

| Verbal Fluency |
|----------------|
| Oral Reading |
| GPT, Do |
| Tab |

There were no significant differences between the control group and the experimental group. The control group showed a greater speed of hand-eye coordination than the treatment group.

Wilson et al (Cornell University) studied the impact of Tomatis on 10 impaired preadolescents (Wilson, 1982). The subjects followed the Tomatis program and a control group, which received no program. Previous research had shown that the Tomatis Program was effective for impaired children. The number of hours of auditory stimulation was 30 hours. The length of the program was 10 weeks.

The test battery included the Wechsler Intelligence Scale for Children (WISC, Wechsler, 1949), the Personality Inventory for Children (PIC, Wirt, 1977, which assesses the opinion of the parents on the child's behavior attitudes and family relationships), the Wide Range Achievement Test (WRAT, Jastak & Jastak, 1969), the Verbal Fluency Test (Strong, undated), the Oral Reading Test (Gates & McKillop, 1962) and the Grooved Pegboard Test (GPT, Klove, 1963, a measure of speed and accuracy of hand-eye coordination).

Table 3 summarizes the results of the study. The children showed significant improvement in their performance on the WRAT, the Verbal Fluency Test, the Oral Reading Test, and the Grooved Pegboard Test. The improvement was significant for all measures except the WISC.

communication skills. The difference between Tomatis and Control group approached statistical significance. Detailed analysis showed that the children treated with the Tomatis Program demonstrated significantly greater improvement in their ability to express thoughts and feelings.

Mould (Brickwall House, East Sussex, England) did two studies, both involving severely dyslexic boys (Mould, 1985). On average, their reading ages were between four and five years below their chronological ages. Written language skills (spelling) were even further behind. The boys lived in a publicly funded school in England, reducing the mitigating influences of home and social environment during the two-year evaluation period.

The first study started in the 1982 school year and involved 23 boys, aged 10 to 15 years. Twelve of them were withdrawn from class in order to receive 100 hours of Tomatis therapy over a period of 6 months. The control group of eleven subjects did not receive any treatment. The second study started in the 1983 school year and involved 24 boys. Half of them were withdrawn from class to receive 100 hours of Tomatis therapy. The control group did not receive any treatment. In this study the students were evaluated on additional parameters.

All subjects were evaluated every six months over a period of two years. However, for some of the measures in the second study, no data after 24 months were reported and thus were substituted for measurements after 18 months. The 24 month data are probably included in the final report (Gilmor & Mould, 1994), a report the author of this paper was unable to obtain. The test battery included the Neale Reading Test (which provides measures of reading rate, accuracy and comprehension), the

| | 1982 | 1983 |
|-------------------------------|-----------|---------|
| N | 12 / 11 | 12 / 12 |
| Neale Reading (accuracy) | 27 / NA | 21 / 11 |
| Neale Reading (comprehension) | NA | 19 / 7 |
| WRAT Reading (raw scores) | 60 / 16.8 | 43 / 22 |
| WRAT Spelling (raw scores) | 53 / 18.5 | 33 / 23 |
| Receptive Vocabulary (BPVS) | NA | NA |
| Verbal Fluency (raw scores) | NA | NA |
| Pupil Rating Scale | 23 / 9.5 | NA |

Table 4 : Brickwall Studies, %Hesse (Mozarteum University in Salzburg) evaluated the quality of the singing voice of seven male music students, three of whom were studying to become professional singers. They received 40 hours of Tomatis therapy (Hesse, 2002). The results were evaluated by a battery of tests, including voice analysis, and the judgment of independent observers. The study concluded that the Tomatis intervention improved the vocal qualities of the participants. The most pronounced effects were those in timbre, sound complexity, tonality and vibrato.

Of importance to note is that the data showed that the improvements continued to build even after the 6 months of Tomatis intervention had been completed. The continued build of the Tomatis therapy is also called the “Extended Tomatis Effect”. An example of the build of the Tomatis Effect over time is given in Figure 1.

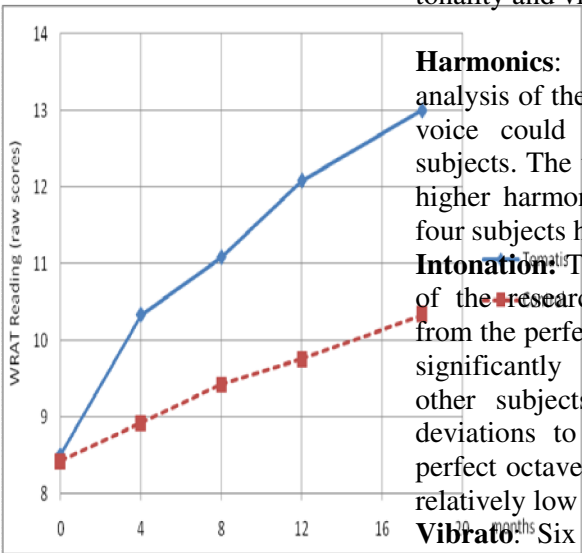


Fig. 1: Extended Tomatis Effect

Harmonics: Due to technical difficulties, the analysis of the number of harmonics present in the voice could only be performed on four test subjects. The tests showed that the intensity of the higher harmonics in the voice of two out of the four subjects had increased.

Intonation: Three of the subjects, who at the start of the research had large percentage deviations from the perfect octave in the lower range ([ba:]), significantly improved their performance. The other subjects had relatively lower percentage deviations to start with. The deviations of the perfect octave in the high range ([bi:]) were also relatively low to start with.

Vibrato: Six of the seven subjects experienced improvement in the quality of their vibrato in the lower ranges, while in the high ranges this occurred only for two subjects.

The Listening Test, administered prior to and upon completion of the Tomatis intervention, showed a significant increase in auditory acuity, especially in the 2,000 to 4,000 Hz frequency range.

The progress was also measured versus a control group (N = 120) who only followed the classical English Language Training. A standardized test which assessed the Vocabulary, Reading and Listening skills was administered two weeks after the start of the Tomatis intervention, and again 9 months later. The students in the Tomatis Group advanced from the 8th to the 5th rank. Those in the control group advanced from the 11th to the 10th rank.

Eurocopter (France) is one of the largest helicopter producers in the world. Since 1989, they have used the Tomatis Method to train its employee to learn foreign languages. Between 1989 and 1995, 580 people took the Tomatis Language Training, and their progress was carefully monitored (Eurocopter, 1995). In Eurocopter's experience, Tomatis Training reduced the time to become fluent from 700 hours to 520 hours, a reduction of 180 hours (26%).

Voice

Tomatis auditory stimulation improves the hearing, especially in the higher frequency range. As per the second law of Tomatis, the voice will thus become richer in the higher harmonics, which improves speech intelligibility and voice quality. In addition, by either shifting to or reinforcing right ear dominance, the voice is controlled more rapidly and with greater accuracy. As a result of the enhanced auditory feedback, Tomatis Training also improves the playing of musical instruments.

auditory training, with emphasis on the active phase, spread over a period of 7 months. The voice withdrawal-from-class basis. They of the subjects was evaluated before and after the 100 hours of Tomatis training. intervention. The evaluation tools The I.D.S. (Leipp, 1977) for 40 minutes per session. No which provides an objective measurement of voice quality (B&K Real Time Frequency Analyzer, 2033). The second test used was the V.D.S. (Leipp, 1977) which explicitly stated, in all likelihood the measures the relative Spectral Density in different frequency bands (Leipp, 1977). A third spectral frequency bands (Leipp, 1977) group of 10 students was taken as a control group and only assessed on the standard school tests.

The LTAS results show that in all cases, the loudness increased significantly, by 20 to 40 dB. In addition, the intervention resulted in a shift in the fundamental region (500 Hz and below) towards the higher frequency bands. The LTAS of one of the subjects is shown in Figure 3.

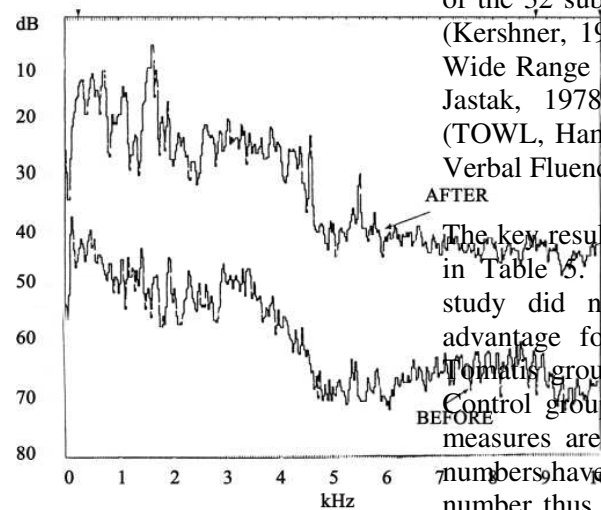


Fig. 3: Long Term Linear Average Spectrum, Before and After Tomatis Intervention

The I.D.S. data also show a shift in the relative energy from the fundamental region towards the frequency bands in which the higher harmonics are

The subjects were assessed prior to the research period and after one year. The progress of 26 out of the 32 subjects was continued for another year (Kershner, 1986/2). The test battery included the Wide Range Achievement Test (WRAT, Jastak & Jastak, 1978), the Test of Written Language (TOWL, Hamill & Larsen, 1983) and the Test of Verbal Fluency (Reitan, 1983).

The key results of the two studies are summarized in Table 5. Kershner *et al.* concluded that this study did not show a statistically significant advantage for the Tomatis Method. While the Tomatis group advanced significantly, so did the Control group. Of importance to note is that the measures are Standard Scores, and that thus the numbers have been corrected for age. Any positive number thus denotes that on average the subjects in this group have progressed faster than would have been expected by maturation alone, which is an achievement for children who had significant delays to start with.

significance, In all but one more than the Verbal Fluency. Also in year reached the meaning that their age group

The lack of several reasons for homogeneity of deviations. The above measures This means large to become confidence level. This assumption unlikely given

Secondly, it was flawed reportedly interventions (Gilmor, 1995) the control group

Of interest measures over normalized measures is intervention its impact could only were continued to expected by Effect).

Gilmor (The Listening Centre, Toronto, Canada) followed the progress of 57 children with learning difficulties, who came to his clinic for treatment (Gilmor, 1982). They were between six to fourteen years old. The length of the Tomatis therapy varied from four to six months. The study is based on pre/post readings and did not include a control group.

The children were assessed using standardized measures of aptitude, achievement and adjustment. The average time between the pre and post assessment was about one year. Not all children were assessed on all tests. The test battery included the Wechsler Intelligence Scale for Children – Revised (WISC-R), the Wide Range Achievement Test (WRAT), the Monroe Sherman Reading Diagnostic Test (Monroe), and the Personality Inventory for Children (PIC).

They results are given in Table 6. All differences are statistically significant at a 99% or higher confidence level.

| | Post - Pre |
|--|------------|
| WISC-R, Std. Score Units (N = 40) | |
| - Full Scale IQ | 6.1 |
| - Verbal IQ | 4.0 |
| - Perceptual-Organizational IQ | 6.9 |
| WRAT, Grade Score Units (N = 57) | |
| - Reading (Word Recognition) | 0.88 |
| - Writing (Spelling) | 0.78 |
| - Arithmetic | 0.77 |
| Monroe, Grade Score Units | |
| - Reading Comprehension (N = 25) | 1.36 |
| - Word Discrimination (N = 24) | 0.89 |
| PIC, T Score (N = 45) | |
| - General Adjustment, Comp. Index | 6.0 |

Table 6: Gilmor Study (1982)

significant improvements were detected.

Reference was made to a similar study by Gilmore (1984/1), but this review paper did not have access to this report. That study was part of the Meta Analysis reported by Gilmor (see below).

Gilmor published a meta-analysis of the studies mentioned above (Gilmor, 1999). It involved 225 learning-disabled children who had about 100 hours of auditory stimulation. Many of the previous studies had relatively small sample sizes, and thus true effects may have been obscured by random variations. By performing a meta-analysis on the pooled results, a reliable result could be obtained. The analysis showed that the Tomatis Method significantly improved skills in the following areas: 75 hours of Tomatis Psychomotor, Personal and Social Adjustment, and Cognitive. The mean effect size ranged from 0.30 and 0.41, which means that the child performing at the 50th percentile before the treatment could be expected to perform at the 62nd to 65th percentile after the treatment session.

| Domain | Mean Effect Size (N = 225) |
|--------------------------------|----------------------------|
| Linguistic | 0.41 |
| Psycho Motor | 0.32 |
| Personal and Social Adjustment | 0.31 |
| Cognitive | 0.30 |
| Auditory | 0.04 |

Table 7: The Gilmor meta-analysis

The low effect size for the auditory domain derives from the strong negative effect (-0.55) found in the Kershner study, contradicting positive effects found in other studies (Rourke: +0.47 and Wilson: +0.23.)

Tatum (Optimal Health & Learning Center, Florida, USA) reported a case study of a 14 year old girl with autism and no speech, who became verbal after receiving Tomatis Therapy combined with Speech Therapy (Tatum, 2004). She received a total of 125 hours of Tomatis Therapy plus 96 hours of Tomatis Therapy combined with Speech Therapy. The speech spread out over a period of 1½ years. Upon completion of the intervention, the subject had functional use of 34 words and had made many improvements. Prior to the Tomatis intervention the subject had had speech therapy for at least 4 years without becoming verbal.

Nel (University of Potchefstroom, South Africa) reported a case study of a 14 year old boy with Asperger's Syndrome (Nel, 2005). The impact of the Tomatis Therapy was measured using the POMS testing instrument (McNair, 2005). The data indicated improvement in Interpersonal Communication and Psychological Well-being.

Learning Foreign Languages

Each language uses a different set of frequencies. As our ears are used to the frequencies of our mother tongue, and are “deaf” to the frequencies of foreign languages, it is difficult to learn a new language. One of the objectives of the Tomatis Method is to open the ear to the full range of frequencies, thereby making it easier to acquire a new language. Once the Tomatis intervention has been completed, one will be able to correctly hear what is said in the new language. Also, as there is a cybernetic loop between the ear and the mouth, it will also be easier to pronounce the new language correctly.

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| VABS (raw scores) | | | | | | |
|--|---------|---|-------|---------|---------|---------|
| Communication | 64/64 | 73/86 | 29/32 | 43/61 | 26/22 | 25/40 |
| Daily Living Skills | 65/56 | 25/88 | 24/46 | 35/57 | 33/29 | 33/49 |
| Motor Skills | 59/64 | NA | 57/60 | 42/62 | 43/41 | 51/56 |
| Socialization | 59/55 | 43/71 | 34/40 | 32/62 | 27/21 | 43/53 |
| | | | | | | |
| BASC, Parents' rating, the normal range is 40 - 60 | | | | | | |
| Attention Problems | 65/62 | 66/53 | 80/65 | 61/73 | 55/54 | 55/61 |
| Atypicality | 63/63 | 62/45 | 71/56 | 71/79 | 119/94 | 71/79 |
| Hyperactivity | 60/59 | 61/54 | 64/57 | 63/50 | 77/60 | 47/60 |
| Withdrawal | 65/65 | 63/63 | 74/76 | 70/59 | 75/74 | 78/57 |
| Social Skills | 32/29 | 35/42 | 16/20 | 28/33 | 11/15 | 32/43 |
| | | | | | | |
| Sensory Profile | 120/117 | 112/167 | 94/97 | 139/154 | 111/122 | 135/126 |
| | | | | | | |
| Legend: | | = significant at a 95% conf. level; NA = Not Applicable | | | | |
| Table 14: Corbett Study, pre / post scores among responders. | | | | | | |

The first conclusion is that the Placebo treatment seems to have had little or no impact on the VABS and BASC scores. Hence, the improvements obtained upon completion of the Tomatis auditory stimulation are thus not a Placebo effect.

Secondly, as with any clinical treatment intervention, the benefits from the Tomatis Therapy varied from child to child. In this study, one subject went from being non-verbal to developing verbal skills (subject 10), another subject went from being non-verbal to being able to repeat words (subject 5), and others increased their vocabulary. Some subjects were reported to have fewer atypical behaviors, other subjects were observed to have diminished hyperactivity with improved ability to attend to structured tasks while

yet other subjects demonstrated measurable improvement with Daily Living Skills. In other subjects, improved motor skills were observed and noted, which usually facilitates language development. Of note is that some of the children approached the BASC norm level (50), which indicates that they started to behave like normal children in this respect.

Thirdly, the tests used only reveal part of the impact of the intervention as the test battery focused on some specific areas. For example, subject 5, who was non-verbal at the start of the research, started to repeat words, something that the test battery failed to identify. Subjects 3 and 8 achieved toilet training, a characteristic also not measured by the test battery. According to the

| Gilmor 1984 Study: % of parents seeing improvements | |
|--|-------|
| Listening | 72/86 |
| Communication | 75/76 |
| Attention Span | 73/54 |
| Frustration Level | 60/54 |
| Reading Comprehension | 72/73 |
| Quality of Speech | 73/54 |
| Memory | 69/54 |
| Spelling/Aptitude | 73/54 |
| Maturity | 84 |
| Table 8: Gilmor 1984 Study: % of parents seeing improvements | |

also reported the results of the Tomatis Therapy on over 400 children and adolescents who came to his clinic for treatment (Gilmor, 1984/2). All of them had well-documented histories of learning problems, as well as a pattern of underachievement on psycho-educational tests. The results of the treatment were graded by the parents, 95% of whom were of the opinion that the program had helped their children. The parents saw improvements in the following areas (see table 8):

with reading versus 33 w may lend s children hav

Attention

Davis (The evaluated th training on e 2005). All p as a result c 9).

| Ability or Be |
|---------------|
| Interpersonal |
| Listening and |
| Academic Ach |
| Attention |
| Behavior |
| Intrapersonal |
| Movement, Sp |
| Musical and V |
| Relaxation |
| Creativity |
| Reading, Writ |
| Well-Being |

Table 9: Dav

Autism

Autism is a which so far Method of a be a cure eit some childre Alfred Toma appreciably

the success rate to 80% in younger autistic children (Vervoort, 2006). The research on the impact of Tomatis Training on Autism is still in its infancy, and more research is needed.

Schiedeck (University of Salzburg) studied the impact of Tomatis therapy on Motor Skills, Visual Perception and Pronunciation (Schiedeck, 2000) on children and adolescents with mild autism. The sample consisted of 20 subjects and all were verbal to varying degrees and had low IQ's (between 50 and 80). Half of the subjects received 46 hours of Tomatis Therapy while the other half did not receive any intervention. The test battery included the LOS KF 18, which assesses motor development (Eggert, 1974), two subtests of the FEW, which determines the visual perception ability (Frostig, 1987), and the DLBT, which assesses whether the sounds are pronounced correctly (Fried, 1997). The results are given in Table 10.

| | Tomatis | Control |
|--|------------|------------|
| | Pre / Post | Pre / Post |
| Motor Skills | 27 / 54 | 28 / 29 |
| Visual Perception | 34 / 58 | 39 / 40 |
| Pronunciation | 48 / 61 | 47 / 48 |
| Table 10: Schiedeck study, normalized data (max = 100) | | |

The Motor Skills and Visual Improvements in the Tomatis group are statistically significant (95% confidence level). The improvement in Pronunciation / Sound Formation is not statistically significant. However, three of the ten subjects in the Tomatis group scored at or near 100% in the pretest and could thus as per definition not improve (ceiling effect). In the Control group, two subjects scored at or near 100% on the pretest. After correcting for the

group improved significantly, the results are still the results are given in Table 13. As performing significantly below the large subjects were severely autistic at the performance (100%). That could be having of the expected as the Tomatis intervention was limited to only 46 hours, while 90 or more hours are recommended when treating subjects with autism.

Interestingly, the Schiedeck data show a strong correlation between the three measures used in this research. The correlation coefficients of the pre-intervention measurements of the test and control group combined are given in table 12 (calculated by the author of this review paper).

| | N = 20 |
|--|--------|
| Motor Skills / Pronunciation | 0.76 |
| Motor Skills / Visual Perception | 0.84 |
| Pronunciation / Visual Perception | 0.91 |
| Table 12: Schiedeck study, Correlation Coefficients at | |

According to Tomatis, the ear, via the vestibular, controls every muscle in the body, including the eye and the larynx, and thus these high correlation coefficients were to be expected.

Neysmith-Roy (University of Regina, Canada) studied the impact of the Tomatis intervention on six severely autistic boys (Neysmith-Roy, 2001). They were assessed on the CARS (Communication Autism Rating Scale) before and after treatment. The CARS is composed of 15 subscales, each measuring a specific behavior. For each of these scales the subject is rated on a continuum from one to four – one being normal behavior, two being mildly abnormal behavior, a three rating equals moderately abnormal behavior and a four rating corresponds to severely abnormal behavior.

Of particular interest were the changes that occurred in the pre-linguistic areas of five of the six boys. These included Adaptation to Change, Listening Response, Non verbal Communication, Emotional Response and Activity Level. The author suggests that the Tomatis method may be

| CARS | |
|------------------------------|------------|
| Subject | Pre / Post |
| A | 44 / 26 |
| B | 48 / 49 |
| C | 47 / 34 |
| D | 44 / 35 |
| E | 47 / 47 |
| F | 53 / 47 |
| Table 13: Neysmith-Roy Study | |

Three of the boys demonstrated positive behavior changes by the end of the treatment (subjects A, C and D). One boy (subject A) was no longer considered autistic by the end of the treatment (CARS score of 26). At the completion of the program, one might consider him “language delayed” but without the autistic behavior. He had received eight blocks of Tomatis treatment (180 hours) spread out over a period of 21 months. Two boys (subjects C and D) showed only mild symptoms of autism by the end of the treatment. Subject C made “notable progress” on 7 of the 15 subscales, and subject D improved by one point or more on five subscales. Three boys remained within the severely autistic range.

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