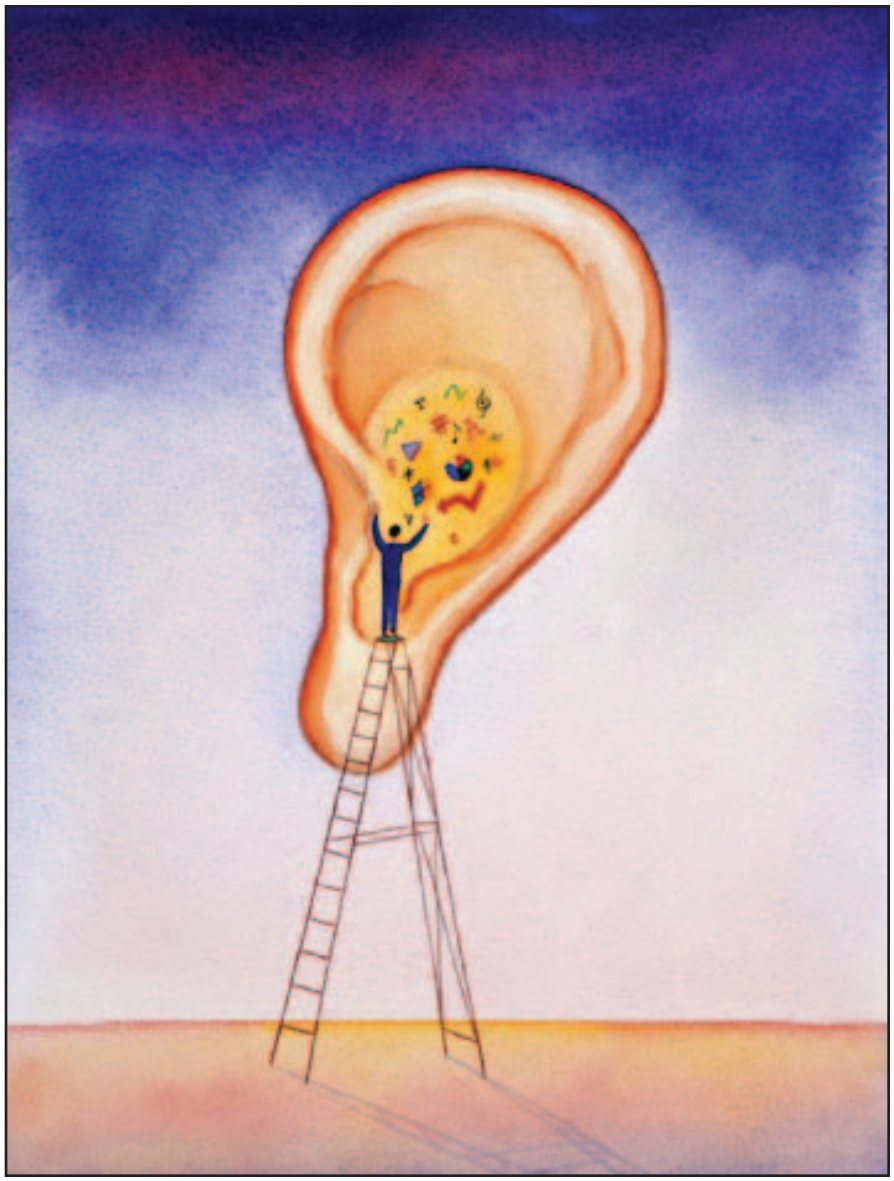
Ricochet™

International Journal of Tomatis Method Research

THIS EDITION



Discovering More About the Ear and Life Through Tomatis Method Research

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May 2004 – Volume 1, No. 1

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EDITOR'S LETTER

Dear Readers:

The establishment of a professional journal is not a task undertaken lightly. In this case, Ricochet Journal™ is the result of the collective effort of members of the International Association of Registered Certified Tomatis Consultants (IARCTC) in response to a growing number of requests for research results about the Tomatis Method. Fortunately, at the same time these requests are increasing, Ricochet Journal is able to respond by publishing two issues each year and special issues as needed with articles that have been peer-reviewed for acceptance.

The articles come from many countries and are written in a variety of languages, though they will always have an English translation since the official language of the IARCTC is English. The articles tell about results from using the Tomatis Method in controlled research studies and well documented case studies. Retrospective and historical studies and related theory are also invited, as are book reviews and Letters to the Editor.

IARCTC is a non-profit organization incorporated in Luxembourg in 2001 and licensed by Tomatis Developpement to be the member association for the worldwide body of Certified Tomatis Method Consultants (CTC). All CTCs are invited to be Registered Certified Tomatis Consultants (RCTC) by joining the IARCTC. A list of the founding members who continue to be active is in this issue of Ricochet Journal (page 85). Members' annual fees provide significant support for strengthening our work as a profession with ethical

guidelines established though our Standards of Practice.

The primary responsibility of the IARCTC according to its members is research. The Research Standing Board was created with the responsibility for reviewing applications and awarding funds and equipment for Tomatis Method research and for publishing a journal.

Despite the past lack of controlled research studies published about this work in all languages, since the 1970s over one hundred papers have been given at official conferences of Tomatis Consultants about the effects of the Tomatis Method on individuals and groups. Many were based on results of pre and post non-normed Tomatis Listening Tests, though some used pre and post standardized instruments in addition or instead. Also occurring during this time was acceptance by graduate committees at universities and departments worldwide of theses and dissertations from students who researched some aspect of the Tomatis Method.

These reports and studies when added to the life long contributions of Dr. Alfred A. Tomatis (1920 – 2001) show how know-

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Ricochet's Mission
To report Tomatis Method research, case studies, and theory worldwide.

Ricochet's Vision
To provide a platform for sharing research, case studies, and information about the Tomatis Method so as to thoroughly investigate how and why the Tomatis Method works and to enlarge its practical applications. The Journal also reports on beginning research projects and other research related to the emerging field of sound training, which began with the Tomatis Method.

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ledge is gained and expanded through the grounded theory research process defined by B. G. Glaser and A. L. Strauss (*The Discovery of Grounded Theory*, 1967). Grounded theory research begins with asking questions, is followed by designing and implementing qualitative and quantitative data collection processes to answer the questions, and eventually results in development of theory from interpretation of these data and in refinement and creation of more questions for research.

In Tomatis' early research in the 1940s (with singers who had a voice problem, which was eventually found to relate to their listening abilities), he had a need to find a solution when traditional medical treatments failed to help. He found a key in an unlikely place: comparison of results of hearing tests of the singers looked identical to results of hearing tests of ammunition factory workers who had a hearing loss. He could not ignore the data. And more importantly, Tomatis wanted to understand what was happening with the data so that he could apply that knowledge to provide a practical solution for the singers. What evolved and is documented historically by publications, patents, and presentations was a theory, more questions to be answered, and a machine to train or retrain the ear and voice using specific protocols (page 49).

The patented technology of the Electronic Ear is at the heart of the Tomatis Method. Its analog technology evolved over forty years into a portable digital technology that fits well in the twenty-first century to provide even greater opportunities for expansion of the Tomatis Method. It is with respect that members of IARCTC pay tribute to Dr. Tomatis for his lifelong pursuit of knowledge and practical solutions using technology (page 43).

You could read the fifteen books written by Tomatis, always published in French and frequently translated into other languages such as English, Spanish, German, Japanese, Italian, and Greek, to follow the evolution of theory. It extends from the first observation that one must improve listening to improve the voice to a wide range of other observations and theories related to the role that listening plays in fetal development, second language learning, improving speech and learning, sensory integration, motor control, balance and posture, confidence in self expression, rehabilitation, spiritual growth, and development of consciousness.

The range of research topics and applications appropriate to the Tomatis Method is huge, in large part due to the wide-ranging impact that listening has on our lives. As a profession we are faced with the daunting challenge of designing and obtaining funding for controlled research studies for topics of special interest and for publishing results if we expect to have a significant impact in the world.

To create direction for the future of Tomatis Method research, Dr. Susan Andrews, an experienced researcher from the United States, provides an overview from her position as Chair of the Research Board (page 16). To make more research possible, we include information about applying for funding and equipment to conduct Tomatis Method related research (page 84).

One of the university researchers that has published results over the last twenty-five years is from the School of Psycho-Social Behavioural Sciences, North-West University (Potchefstroom Campus) in South Africa. Professor du Plessis and two colleagues have provided an article for this first issue of Ricochet Journal about the use of a combined Tomatis Method and psycho-educational program. This program concerns weight preoccupied, female South African students (page 63). One might wonder why the students are sitting and listening instead of exercising. The study is included because it makes us aware of a number of situations that must be controlled during research. Also, a basis for this application exists that was identified by Dr. Tomatis in the chapter "Language and Body Image" from his first book, *L'Oreille et Langage* (1963), with the English translation, from *The Ear and Language* (1996; used with permission). This chapter provides additional insights into body awareness and the Tomatis Method and is reprinted here with permission (page 51).

Also included from *The Ear and Language* is the "Afterword" to explain more about the Tomatis Method and Listening Test for those who may be unfamiliar with the work (page 55).

A series of nearly thirty ear, nose, throat and speech/language pathology research studies has been published in journals in Poland. Three of the authors prepared an article for this issue of

Ricochet Journal (page 75). They represent a new group of researchers who are contributing to our understanding of the application of the Tomatis Method to speech and language pathology. Also included in the journal are two speech and language case studies by Nicoloff from Australia (page 30) and by Tatum, Oelfke and McCauley (page 37) from the United States to further information about this application.

Another case study by Trumps from the United States (page 23) shows the use of the Tomatis Method over an extended time to achieve results with a person who had a severe head injury. This case study demonstrates that the Tomatis Method frequently expands the potential of clients beyond what others thought possible.

A language study research project undertaken in several universities in European Union countries was called the Lingua-Socrates Project. A book review written about the results is included (page 80).

Also related to language study, Murase has provided research results from a study in Japan where the Tomatis Method was used to teach English to high school students with excellent results (page 60). A review of several books published in Japanese is also included in this Journal (page 82).

Already you can see that work reported in this issue comes from five continents: Europe, Africa, Australia, Asia, North America. More research applications are being submitted from Registered Certified Tomatis Consultants worldwide, and we encourage studies to be submitted from outside researchers who want to study this method.

One research study funded by IARCTC is in process in the United States. The study investigates the results of using an educational Tomatis Method program with normal kindergarten and first grade students to evaluate pre-reading skill development (page 59). Such a study could impact the greater use of the Tomatis Method for educational applications.

Offshoots of the Tomatis Method have emerged since at least the 1970s. Others will continue to develop as business opportunities for sound training grow. Ricochet welcomes comparative studies of other methods with the Tomatis Method, the latter provided by a Registered Certified Tomatis Consultant. The expected growth of the field of sound training will provide ample material for research for years to come.

We invite submissions of completed research studies, replication studies, comparative studies, case studies, theory development, book reviews, and Letters to the Editor for peer reviewed publication. When possible the abstract and the article will be published in more than one language, always in English. We invite Letters to the Editor, and the first ones have arrived (page 14).

I am grateful for the opportunity to be the first Editor of Ricochet Journal and thank the members of the Editorial Board, all of whom have given generously of their time as peer reviewers, translators, and contributors. Ricochet Journal has come alive and we are ushering in a new age of Tomatis Method research!

Dr. Billie M. Thompson, RCTC
Editor, Ricochet Journal
President, IARCTC
May 2004

Traduction Française

Chers Lecteurs:

L'établissement d'un journal professionnel n'est pas une tâche entreprise à la légère. Dans le cas présent, le Journal « Ricochet„ est le résultat de l'effort collectif des membres de l'Association Internationale de Consultants Tomatis Certifiés Enregistrés (IARCTC) en réponse à un nombre croissant de demandes de résultats de recherche à propos de la Méthode de Tomatis. Heureusement, alors que ces demandes se multiplient, le Journal Ricochet pourra y répondre en publiant deux numéros par an et des éditions spéciales si nécessaire avec des articles qui ont été revus par un groupe de collègues pour approbation.

Les articles viennent de nombreux pays et sont écrits en différentes langues, cependant ils seront toujours traduits en Anglais puisque c'est la langue officielle de l'IARCTC. Les articles rapportent les résultats obtenus suite à l'utilisation de la Méthode de Tomatis et ce à propos de recherches avec groupe de control et d'études de cas bien documentées. Les articles sur les études rétrospectives et historiques ainsi que sur la théorie inhérente à la méthode sont les bienvenus, comme le sont les revues de livres et les Lettres à

l'Editeur. Dactylographiez votre texte ici.

IARCTC est une association à but non lucratif incorporée au Luxembourg en 2001 et autorisée par Tomatis Developpement SA pour être l'association des membres à l'échelon mondial des Consultants Certifiés de la Méthode de Tomatis (CTC). Tous les CTC sont invités à être Consultants Tomatis Certifiés et Enregistrés (RCTC) en joignant l' IARCTC. Une liste des membres fondateurs en activité est publiée dans cette édition du Journal Ricochet (page 85). Les cotisations annuelles des membres fournissent le support incontestable pour renforcer notre travail en tant que profession avec un code de déontologie établi ainsi que nos Normes de Pratique.

Le domaine de la recherche est la première implication de l' IARCTC au dire de ses membres. Le Comité de Recherche a été créé avec pour responsabilité de passer en revue les applications de projets de recherche ainsi que l'attribution de fonds et d'équipement pour la recherche sur la Méthode Tomatis et la publication d'un journal.

En dépit dans le passé du manque d'études de recherche avec groupe de control publiées de ce travail dans toutes les langues, depuis les années 70 plus de cent papiers ont été donnés aux conférences officielles des consultants Tomatis au sujet des effets de la méthode de Tomatis sur des individus et des groupes. Beaucoup ont été basés sur les résultats pré et post tests obtenus avec le Test d'Ecoute Tomatis non normalisé, bien que certains aient aussi utilisé d'autres instruments standardisés soit en plus soit pour le remplacer. De plus, pendant toute cette période, on a vu, à l'échelon mondial, les comités de diplômés aux universités et aux départements accepter ces papiers et les thèses d'étudiants qui ont fait des recherches sur certains aspects de la Méthode Tomatis.

Ces rapports et ces études sont venus s'ajouter aux contributions de la longue vie du Dr. Alfred A. Tomatis (1920 – 2001) et montrent comment la connaissance a gagné du terrain et s'est accrue par la recherche de théorie basée sur le terrain définie par B. G. Glaser et A. L. Strauss (*The Discovery of Grounded Theory* [*La Découverte de la théorie du terrain*], 1967). La recherche fondée sur la théorie de Glaser et Strauss commence en se posant des questions, ce qui est suivi par la mise en place et l'application de procédés de collection de données qualitatives et quantitatives pour répondre à ces questions. Ceci a pour résultat de générer l'éventuel développement dune théorie de l'interprétation de ces données, son raffinement et l'élaboration de nouvelles questions pour la recherche.

Dans ses premières recherches dans les années 40, (avec les chanteurs qui avaient un problème de voix, qui a mis en évidence que c'était en fait relié à leur capacité d'écoute), Tomatis a eu besoin de trouver une solution pour pallier les traitements médicaux traditionnels mis en échec. Il a trouvé une clef dans un domaine inattendu: la comparaison de résultats des tests auditifs des chanteurs se montrant identiques aux tests auditifs d'ouvriers d'usine d'armement qui avaient une perte d'audition. Tomatis ne pouvait pas négliger ces données. De plus, il voulait absolument comprendre ce que ces données révélaient afin d'élaborer à partir de cette nouvelle connaissance, une solution pratique pour les chanteurs. Ce qui en a résulté et qui est historiquement documenté par les publications, les brevets, et les présentations est une théorie, avec davantage de questions en attente de réponses, et une machine pour éduquer ou rééduquer l'oreille et la voix en utilisant des protocoles spécifiques (page 49).

La technologie déposée et l'Oreille Electronique patentée est au coeur de la Méthode Tomatis. Sa technologie utilisant l'analogue a évolué au-delà des quarante dernières années en une technologie numérique portable qui s'adapte bien au vingt et unième siècle. Elle ouvre les portes à de plus grandes opportunités pour l'expansion de la Méthode Tomatis. C'est avec grand respect que les membres de l'IARCTC rendent hommage au Dr. Tomatis pour sa quête sans fin de connaissance et de solutions pratiques utilisant la technologie (page 43).

Afin de suivre l'évolution de la théorie, vous pouvez lire les quinze livres écrits par Tomatis, toujours publiés en français et fréquemment traduit dans d'autres langues telles que l'Anglais, l'Espagnol, l'Allemand, le Japonais, l'Italien, et le Grec. Elle s'étend de la première observation qui est d'améliorer l'écoute pour améliorer la voix à un éventail plus large d'autres observations et autres théories liées au rôle de l'écoute dans le développement foetal, l'apprentissage

d'une deuxième langue, dans l'amélioration du langage et des apprentissages, l'intégration sensorielle, le contrôle moteur, l'équilibre et la posture, la confiance en soi, la réadaptation, la croissance spirituelle, et le développement de la conscience.

L'éventail des sujets de recherche et les applications appropriées à la Méthode Tomatis est immense, en grande raison du au large impact que l'écoute a sur nos vies. En tant que profession, nous sommes confrontés au défi impressionnant de concevoir et d'obtenir des subventions pour faire des recherches avec groupe de control dans des domaines d'intérêt spécifique et d'en publier les résultats si nous voulons avoir un impact incontestable dans le monde.

Le Dr. Susan Andrews, un éminent chercheur des Etats-Unis, préside le Comité de Recherches Tomatis, et en donne les grandes lignes (page 16). Pour permettre davantage de recherche, nous incluons ici le formulaire d'application pour faire une demande de subvention et d'équipement pour diriger une recherche liée à la Méthode de Tomatis (page 84).

Un des chercheurs d'université qui a publié des résultats pendant les vingt-cinq dernières années est un intervenant de l'Ecole des Sciences du comportement Psychosocial, de l'Université Nord-ouest (le Campus de Potchefstroom) en Afrique du Sud. Le professeur Du Plessis et deux de ses collègues ont fourni un article pour ce premier numéro du Journal Ricochet à propos de l'utilisation de la Méthode de Tomatis associée à un programme psycho éducatif. Ce programme concerne le souci qu'ont les étudiantes d'Afrique du sud à propos de leur poids, (page 63). On pourrait d'ailleurs se demander pourquoi les étudiantes restent assises à écouter de la musique au lieu de faire de l'exercice. Cette étude est incluse dans ce numéro parce qu'elle permet de prendre conscience d'un certain nombre de situations qui doivent être contrôlées pendant la recherche. Cependant, une base pour cette application avait déjà été identifiée par le Dr. Tomatis dans le chapitre «langage et image du corps » dans son premier livre, «l'Oreille et Le Langage» (utilisé avec la permission). Ce chapitre fournit des pistes de réflexion supplémentaires sur la conscience du corps et la Méthode Tomatis et est réimprimé ici avec permission (page 51).

De plus la Postface de « l'Oreille et le Langage » est présentée ici pour expliquer davantage la Méthode Tomatis et le Test d'Ecoute pour ceux qui ne sont pas familiers avec ce travail (page 55).

Une série de près de trente études et recherches dans le domaine de la pathologie en oto-rhino-laryngologie et les troubles du langage a été publiée dans des journaux en Pologne. Trois des auteurs ont préparé un article pour cette édition du journal Ricochet (page 75). Ils représentent un nouveau groupe de chercheurs qui contribuent à accroître notre compréhension de l'application de la Méthode Tomatis dans le domaine de la parole et de la pathologie du langage. Pour plus d'information sur l'application de la Méthode Tomatis dans ce domaine, deux études de cas sur le langage et les troubles de la parole sont aussi incluses dans cette édition du Journal, l'une de Nicoloff d'Australie (page 30) et l'autre de Tatum, Oelfke et McCauley des Etats-Unis (page 37).

Une autre étude de cas par Trumps des Etats-Unis (page 23) montre l'utilisation de la Méthode Tomatis pendant une longue période et l'obtention de résultats avec un sujet qui souffrait de graves traumatismes crâniens. Cette étude de cas démontre comment la Méthode Tomatis accroît souvent le potentiel des clients au delà de ce que d'autres pensent possible.

Un projet de recherche entrepris dans plusieurs universités dans les pays de l'Union Européenne pour l'apprentissage des langues porte le nom de projet Lingua-Socrates. Un commentaire écrit au sujet des résultats de cette recherche est inclus dans ce numéro (page 80).

Toujours dans le domaine de l'étude des langues, Murase a communiqué les résultats d'une étude réalisée au Japon où la méthode Tomatis a été utilisée pour enseigner l'Anglais aux lycéens avec d'excellents résultats (page 60). Une revue de plusieurs livres publiés en Japonais est également incluse dans ce Journal (page 82).

Vous pouvez déjà voir que le travail rapporté dans cette première édition du Journal provient des cinq continents : l'Europe, l'Afrique, l'Australie, l'Asie, l'Amérique du Nord. Encore plus d'applications de recherches nous sont soumises émanant des Consultants Tomatis Certifiés Enregistrés du monde entier, et nous encoura-

geons vivement les chercheurs extérieurs qui veulent étudier cette méthode à soumettre leurs projets de recherche.Financée par IARCTC, une recherche est actuellement en cours aux Etats-Unis. Cette recherche vise à étudier les résultats de l'utilisation de la Méthode Tomatis dans un programme éducatif dans une classe de jardin d'enfants normale et une première classe de primaire afin d'évaluer le développement des compétences de préparation à la lecture (page 59). Une telle étude pourrait déboucher sur une utilisation plus large de la Méthode Tomatis dans des applications éducatives.

Des ramifications de la méthode de Tomatis ont émergé depuis au moins les années 70. D'autres vont continuer à se développer depuis que les opportunités de business basées sur la stimulation auditive se développent. Ce Journal accueille des études comparatives sur les autres méthodes et la Méthode Tomatis appliquée par un Consultant Tomatis Certifié Enregistré. Le développement attendu dans le domaine de la stimulation auditive va fournir un vaste matériel pour la recherche dans les années à venir.

Nous invitons pour publication dans le Journal, les soumissions de recherches terminées et complètes, de duplications de recherches, d'études comparatives, d'études de cas, de papiers sur le développement de la théorie, de revues de livre, et de lettres au rédacteur en chef ; la publication se faisant après une revue par un collège de pairs. Nous veillerons à ce que les résumés et les articles soient publiés en plusieurs langues autant que faire se peut, et ils le seront toujours au moins en Anglais. Nous vous invitons à envoyer vos lettres au rédacteur. Une première lettre nous est parvenue ainsi que la notre (page 14).

Je suis reconnaissante pour l'occasion qui m'est donnée d'être le premier rédacteur en chef du Journal Ricochet et de remercier les membres du Comité de rédaction, et tous ceux et celles qui ont donné si généreusement de leur temps comme critiques, traducteurs et intervenants. Le Journal Ricochet est enfin né et nous entrons ainsi dans une nouvelle ère pour la Méthode de Tomatis et la recherche !

Dr. Billie M. Thompson, RCTC
Rédacteur en chef, *Ricochet*
Président, IARCTC
Mai 2004

Deutsche Übersetzung

Liebe Leser von Ricochet,

Die Vorbereitung eines neuen berufsspezifischen Publikation ist keine leichte Aufgabe. In diesem Fall ist das neue Ricochet Journal™ das Resultat einer kollektiven Anstrengung von Mitgliedern des Internationalen Verbandes der registrierten und zertifizierten Tomatis-Therapeuten (IARCTC) als Antwort auf eine wachsende Nachfrage nach Forschungsresultaten über die Tomatis-Methode. Diese Nachfrage wird das Ricochet Journal durch zwei jährliche Ausgaben und gegebenenfalls durch Sonderausgaben mit von Kollegen durchgesehenen Artikeln befriedigen.

Die Beiträge kommen aus vielen Ländern und sind in vielen Sprachen geschrieben. Sie werden jedoch immer in einer englischen Übersetzung dargeboten, denn die offizielle Sprache der IARCTC ist Englisch. Die Artikeln geben Auskunft über die Nutzung der Tomatis-Methode in kontrollierten Forschungsstudien und gut dokumentierten Fallstudien. Rückblickende und historische Arbeiten und einschlägige theoretische Aufsätze sowie Bücherbesprechungen und Leserbriefe sind ebenso vorgesehen.

IARCTC ist eine Nonprofit-Organisation, 2001 in Luxemburg gegründet und lizenziert durch Tomatis Developement als die Mitgliederverband der weltweiten Gemeinschaft der zertifizierten Tomatis-Therapeuten (CTC). Alle CTCs sind eingeladen, durch Ihren Beitritt zur IARCTC zu registrierten zertifizierten Tomatis-Therapeuten (RCTC) zu werden. Diese Ausgabe des Ricochet Journals enthält eine Liste der noch aktiven Gründungsmitglieder (Seite 85).

Die jährlichen Mitgliedsgebühren ermöglichen unsere Arbeit für ein Berufsbild mit ethischen Grundsätzen, die durch unsere Anwendungsrichtlinien festgelegt sind. Die Hauptaufgabe der IARCTC ist auf Wunsch ihrer Mitglieder die Forschung. Deshalb wurde der Forschungsausschuss geschaffen, um eingereichte Forschungsprojekte zu prüfen, Mittel und Geräte für Forschungsarbeiten über die Tomatis-Methode zur Verfügung zu stellen und die Ergebnisse zu publizieren.

Trotz des Fehlens von Publikation über verifizierte Forschungsarbeiten in diesem

Bereich in allen Sprachen in den vergangenen Jahren wurden seit den 70er Jahren des vorigen Jahrhunderts über hundert Vorträge bei offiziellen Kongressen der Tomatis-Therapeuten über die Wirkung der Tomatis-Methode auf Einzelpersonen und Gruppen gehalten. Viele basierten auf den Resultaten des vorher und nachher durchgeführten, nicht normierten Tomatis-Listening-Tests, einige benutzten auch zusätzlich oder statt dessen standardisierte Instrumente. Ebenso wurden weltweit von Universitäten und Forschungseinrichtungen Arbeiten und Dissertationen von Studenten akzeptiert, die Aspekte der Tomatis-Methode zum Inhalt hatten.

Diese Berichte und Arbeiten – ergänzt durch die lebenslangen Beiträge von Dr. Alfred Tomatis (1920 – 2001) – zeigen, wie Wissen durch den Forschungsansatz „Grounded Theory", beschrieben durch B. G. Glaser und A. L. Strauss (*Die Entdeckung der „Grounded Theory"*, 1967) angesammelt und erweitert werden kann. Forschungen nach diesem Ansatz beginnen mit dem Fragenstellen, setzten fort mit dem Design und der Implementation von qualitativen und quantitativen Datenerfassungsprozessen, um die vorher gestellten Fragen zu beantworten, und führen gegebenenfalls zu der Entwicklung einer Theorie aus der Interpretation dieser Daten sowie zu der Gewinnung weiterer Fragen für neue Forschungsarbeiten.

Im Zuge der frühen Forschungen von Tomatis in den vierziger Jahren (mit Sängern mit Stimmproblemen, die sich tatsächlich als Folge von Hörproblemen herausstellten), bestand die Notwendigkeit, eine Lösung zu finden, nachdem die traditionellen medizinischen Behandlungen fehlschlugen. Er fand einen ungewöhnlichen Schüssel: Im Vergleich stellten sich die Resultate der Hörtests der Sänger identisch zu denen von Munitionsfabrikarbeitern mit vermindertem Hörvermögens dar. Er konnte diese Ergebnisse nicht ignorieren. Vielmehr wollte Tomatis verstehen, wieso es zu diesen Daten kam, um dieses Wissen zur Gewinnung einer praktischen Therapie für die Sänger einzusetzen. Was daraus entstand und was historisch in Publikationen, Patenten und Präsentationen dokumentiert ist, war eine Theorie, waren weitere Fragen, die es zu erforschen galt, und war ein Gerät zum Training des Gehörs und der Stimme mit speziellen Funktionen (Seite 49).

Die Technologie des Elektronischen Ohrs ist das Herz der Tomatis-Methode. Die ursprünglich analoge Technologie entwickelte sich über vierzig Jahre hinweg in eine portable digitale Technologie, die gut in das einundzwanzigste Jahrhundert passt und so weitere Möglichkeiten für die Expansion der Tomatis-Methode ermöglicht. Mit großer Wertschätzung danken die IARCTC-Mitglieder Herrn Dr. Tomatis für seine lebenslange Forschung und seine praktischen technischen Lösungen. (Seite 43).

Die Evolution der Theorie ist in den fünfzehn Büchern von Tomatis nachvollziehbar, die in Französisch und oft auch in andere Sprachen wie Englisch, Spanisch, Deutsch, Japanisch, Italienisch und Griechisch übersetzt publiziert wurden. Diese Evolution geht von der ersten Entdeckung aus, dass mit einer Gehörverbesserung auch eine Stimmverbesserung zu erzielen ist, und führt in der Folge in ein weites Feld von Entdeckungen und Theorien in Bezug auf die Rolle des Gehörs bei der fötalen Entwicklung, beim Lernen von Fremdsprachen, bei der Verbesserung der Sprach- und Lernfähigkeiten, bei der sensorischen Integration, der motorischen Kontrolle, beim Gleichgewicht und der Haltung, beim Selbstvertrauen, bei der Rehabilitation, beim geistigen Wachstum und bei der Entwicklung des Bewusstseins.

Das Feld von Forschungsthemen und Anwendungen der Tomatis-Methode ist riesig, vor allem aufgrund des weitreichenden Einflusses des Gehörs auf unser Leben. In unserem Beruf sind wir oft mit der entmutigenden Aufgabe konfrontiert, Finanzierungen von anerkannten Forschungsarbeiten in speziellen Interessensbereichen und der Publikation der Resultate zu erlangen, wenn wir eine weltweite Geltung erreichen wollen.

Um Leitlinien für die Zukunft der Tomatis-Forschung zu schaffen, gibt Fr. Dr. Susan Andrews, eine erfahrene Forscherin aus den USA, einen Überblick aus ihrer Position als Vorsitzende des Forschungsausschusses (Seite 16). Um die Forschung zu fördern, vermitteln wir Informationen, wie man sich um Finanzierungen und um Geräte für die Durchführung von Forschungsarbeiten für die Tomatis-Methode bewirbt (Seite 84).

Aus dem Institut für psychosoziale Verhaltenswissenschaften der Nordwest-Universität (Potchefstroom) in Südafrika stammt ein Forscher, der in den letzten fünfundzwanzig Jahren viele Arbeiten publiziert hat. Professor du Plessis and zwei seiner Kollegen haben der ersten Ausgabe des Ricochet Journals eine Arbeit über die kombinierte Nutzung der Tomatis-Methode mit einem psychopädagogischen Programm zur Verfügung gestellt. Diese Untersuchung betrifft südafrikanische Studentinnen mit Gewichtsproblemen (Seite 63). Man könnte verwundert sein, warum diese Studentinnen sitzen und hören anstatt zu üben. Diese Studie zeigt, welche Vielzahl von Problemen man im Zuge der Forschungsarbeiten lösen muss. Auch wurde die Grundlage für diese Anwendung von Dr. Tomatis geschaffen, und zwar im Kapitel "Sprache und Körperbild" in seinem ersten Buch "Das Ohr und die Sprache". Dieses Kapitel gewährt zusätzliche Einsicht in das Körperbewusstsein und die Tomatis-Methode und wird hier mit Genehmigung nochmals wiedergegeben (Seite 51).

Auch das Nachwort von "Das Ohr und die Sprache" ist in dieser Ausgabe enthalten, um mehr über die Tomatis-Methode und den Hörtest für jene darzustellen, denen dieses Werk unbekannt ist (Seite 55).

Eine Serie von fast dreißig Forschungsstudien über die Pathologie des Ohrs, der Nase, des Rachens und der Sprache wurden in Journalen in Polen veröffentlicht. Drei dieser Autoren erstellten einen Artikel für diese Ausgabe des Ricochet Journals (Seite 75). Sie repräsentieren eine neue Gruppe von Forschern, die Beiträge zu unserem Verständnis der Anwendung der Tomatis-Methode im Bereich der Sprachpathologie liefern. Ebenfalls enthalten in dieser Ausgabe sind zwei Fallstudien im Bereich Sprache von Nicoloff aus Australien (Seite 30) und von Tatum, Oelfke und McCauley (Seite 37) aus den USA zur weiteren Informationen über diese Anwendung.

Eine andere Fallstudie von Trumps aus den USA (Seite 23) zeigt die Nutzung der Tomatis-Methode über einen längeren Zeitraum hinweg, um Resultate bei Personen mit schweren Kopfverletzungen zu erreichen. Diese Fallstudie demonstriert, dass die Tomatis-Methode oft das Potential der Klienten über die Erwartungen anderer hinaus erweitern kann.

„Lingua-Socrates Projekt" wurde ein Forschungsprojekt für Sprachstudien von mehreren Universitäten in Staaten der EU genannt. Eine Buchbesprechung über diese Ergebnisse ist in dieser Ausgabe enthalten (Seite 80).

Ebenfalls bezogen auf Sprachstudien stellte Frau Murase Forschungsresultate aus Japan zur Verfügung, wo die Tomatis-Methode bei der Englisch-Schulung für Hochschulstudenten mit exzellenten Ergebnissen eingesetzt wurde (Seite 60). Eine Besprechung von mehreren in Japan erschienenen Büchern findet sich auch in dieser Ausgabe (Seite 82).

Es ist bereits ersichtlich, dass Arbeiten aus den fünf Kontinenten Europa, Afrika, Australien, Asien und Nordamerika in dieser Ausgabe enthalten ist. Weitere Forschungsvorhaben wurden von RCTCs weltweit eingereicht und wir ermutigen alle, weitere Forschungsvorhaben von externen Forschern, die diese Methode untersuchen wollen, anzumelden.

Eine solcherart von IRACTC finanzierte Forschungsstudie ist derzeit in den USA im Laufen. Diese Arbeit erforscht die Resultate des Einsatzes der Tomatis-Methode im normalen Kindergarten sowie bei Studenten mit erstem Studiendiplom zur Bewertung der Entwicklung des Voraus-Lesevermögens (Seite 59). Diese Studie könnte für die generelle Nutzung der Tomatis-Methode in pädagogischen Anwendungen hilfreich sein.

Ableger der Tomatis-Methode sind zumindest seit den siebziger Jahren entstanden. Entsprechend dem Wachstum der Geschäftsmöglichkeiten für Klangtherapien werden weitere entstehen. Dieses Journal begrüßt Vergleichsstudien von anderen Methoden mit der Tomatis-Methode, zur Verfügung gestellt durch RCTCs. Das erwartete Wachstum im Bereich Klangtherapien wird für die kommenden Jahre ausgedehntes Forschungsmaterial zur Verfügung stellen.

Wir laden zur Einreichung von fertigen Forschungsarbeiten, Gegenstudien, Vergleichsstudien, Fallstudien, Theorie-Darstellungen, Buchbesprechungen und Leserbriefen zur Begutachtung durch Kollegen ein. Wenn möglich, wird die Zusammenfassung und der Artikel in mehr als einer Sprache, aber immer in Englisch publiziert. Besonders ersuchen wir um Leserbriefe. Der erste ist bereits eingetroffen (Seite 14).

Ich bin dankbar, dass mir die Möglichkeit gegeben wurde, der erste Herausgeber des Ricochet Journals zu sein und ich danke den Mitgliedern des Redaktionsteams, die alle großzügig ihre Zeit als kollegiale Zweitleser, Übersetzer und Beitragende zur Verfügung gestellt haben. Das Ricochet Journal ist nun geschaffen und wir bereiten den Weg für ein neues Zeitalter der Tomatis-Forschung!

Dr. Billie M. Thompson, RCTC
Herausgeber, Ricochet
Präsidentin der IARCTC
Mai 2004

Traducción Española

Estimados lectores:

Es establecimiento de un diario profesional no es una tarea que se toma a la ligera. En este caso, el Diario Ricochet es el resultado del esfuerzo colectivo de miembros de la IARCTC en respuesta al creciente numero de peticiones en cuanto a resultados de investigación acerca del Método Tomatis. Afortunadamente, al mismo tiempo que estas peticiones van en aumento, el Diario Ricochet es capaz de responder publicando dos ejemplares por años y ediciones especiales cuando se requiera con artículos revisados antes de aceptarse para su publicación.

Los artículos vienen de varios países y están escritos en una variedad de idiomas, mientras que siempre tendrán traducción al Ingles, siendo este el idioma oficial de la IARCTC. Estos artículos muestran resultados derivados de la utilización del Método Tomatis en investigaciones controladas y casos bien documentados. Son bienvenidos estudios retrospectivos e históricos y teorías relacionadas con el tema, así como criticas literarias y cartas al Editor.

La IARCTC es una asociación sin fines de lucro incorporada en Luxemburgo en 2001 y autorizada por Tomatis Developpement para ser la asociación de miembros del total de Consultores Tomatis Certificados (CTC). Todos los CTC están invitados a registrarse y pertenecer a la asociación de Consultores Tomatis Certificados y Registrados (RCTC). Pueden encontrar una lista de los miembros fundadores activos en este ejemplar de Ricochet (Pág. 85). La cuota anual provee apoyo significativo para reforzar nuestro trabajo como profesionales con reglas éticas por medio de Los Estándares de Practica.

La responsabilidad primordial de la IARCTC de acuerdo a sus miembros, es la investigación. El Comité de investigación se creo con la responsabilidad de revisar aplicaciones y adjudicar fondos y equipo para investigación sobre el Método Tomatis y para publicar Ricochet.

A pesar de la falta, en el pasado, de la publicación de investigaciones controladas sobre su trabajo en varios idiomas, desde 1970 se han presentado mas de un ciento de trabajos en conferencias oficiales de Consultores Tomatis, acerca de los efectos del Método Tomatis en individuos y en grupos. Muchos de estos basados en resultados de pre y post evaluación por medio de la no estandarizada Prueba de Escucha Tomatis, aunque algunos utilizaron instrumentos estandarizados de evaluación en lugar de esta prueba/ Al mismo tiempo, algunas universidades aceptaron tesis y disertaciones de estudiantes que investigaron algún aspecto del Método Tomatis.

Estos reportes y estudios, al añadirse a las contribuciones del Dr. Alfred A. Tomatis (1920-2001), muestran como el conocimiento se adquiere y expande a través del proceso de investigación conocido como Teoría Fundamentada, definida por B.G. Glasser y A.L. Strauss (*The Discovery of Grounded Theory*, 1967). La investigación en la Teoría Fundamentada comienza por preguntarse, continua al diseñar e implementar recolección de datos tanto cualitativos como cuantitativos para responder a estas preguntas y eventualmente resulta en el desarrollo de una teoría como interpretación de estos datos y en el refinamiento y creación de nuevas preguntas a investigar.

En la investigación temprana de Tomatis, a principios de los años 40 (con cantantes que tenían problemas de voz, lo cual eventualmente se encontró tenia relación con sus habilidades de escucha), tenia necesidad de encontrar una solución cuando los tratamientos médicos tradicionales fracasaron. Encontró una clave en un lugar inesperado: la comparacion en los resultados de pruebas audiometricas de los cantantes que a su vez, parecian identicas al resultado de las pruebas aplicadas a los trabajadores de una fabrica de municiones que presentaban perdida auditiva. No podía ignorar los datos, y principalmente, Tomatis quería

entender lo que estaba pasando con la información para así poder aplicar el conocimiento y proveer una solución practica para los cantantes. Esto evoluciono y esta documentado históricamente e publicaciones, patentes y presentaciones, es una teoría, mas preguntas a responder y una maquina para entrenar o re-entrenar el oído y la voz utilizando ciertos protocolos específicos (Pág. 49)

La tecnología patentada del Oído Electrónico es el corazón del Método Tomatis. Su tecnología analógica ha evolucionado por cuarenta años hacia una tecnología digital portátil que se adapta bien al siglo 21 para proveer aun mas grandes oportunidades de expansión al Método Tomatis.. Es con respeto que los miembros de la IARCTC rinden tributo al Dr. Tomatis por la búsqueda, a través de su vida, del conocimiento y soluciones practicas utilizando tecnología Pág. 43)

Podrían leer los 15 libros escritos por Tomatis siempre publicados en Francés y frecuentemente traducidos a otros idiomas como Ingles, Español, Alemán, Japonés, Italiano y Griego, para seguir la evolución de su teoría. Esta se extiende desde la primera observación de que uno debe mejorar la Escucha para mejorar la voz, hasta un amplio rango de observaciones y teorías relacionadas al rol que juega la escucha en el desarrollo fetal, el aprendizaje de un segundo idioma, la mejoría del lenguaje y el aprendizaje, la integración sensorial, el control motor, el equilibrio y la postura, la confianza en la auto expresión, la rehabilitación, el crecimiento espiritual y el desarrollo de conciencia.

El rango de temas y aplicaciones a investigar, relacionadas al Método Tomatis es inmenso, esto es debido en gran parte, al amplio rango de impacto que la escucha tiene en nuestra vida. Como profesión, nos enfrentamos con el reto de diseñar y obtener fondos para estudios e investigaciones controladas y publicación de resultados si es que queremos tener un impacto significativo en el mundo.

Para guiar la dirección futura de la investigación del Método Tomatis, la Dra., Susan Andrews, investigadora experimentada de los Estados Unidos, provee un panorama desde su posición como presidenta del Comité de Investigación (Pág. 16). Para permitir mayores posibilidades de investigación, incluimos información de cómo aplicar para recibir fondos y equipo para realizar investigación relacionada al Método Tomatis (Pág. 84)

Uno de los investigadores universitarios que ha publicado resultados sobre el Método Tomatis en los últimos 25 años, viene de la Escuela de Ciencias Psico-Sociales y Conductuales de la NW University (Campus de Potchefstromm) en Sud Africa. El Profesor DuPlessis y dos de sus colegas han provisto un articulo para este primer ejemplar de Ricochet, acerca de la utilización de una combinación del Método Tomatis y un programa psico-educativo. Este programa se enfoca a estudiantes Sud Africanas preocupadas por su peso. (Pág. 63) Uno se preguntara como las estudiantes están sentadas escuchando en lugar de hacer ejercicio. Este estudio se incluye aquí porque nos hace conscientes del numero de situaciones que deben ser controladas durante una investigación. También, existe una base para esta aplicación que el Dr. Tomatis identifica en el capitulo " Lenguaje e Imagen Corporal", en su primer libro "El Oído y el Lenguaje" (utilizado aquí con permiso). Este capitulo provee introspecciones adicionales en cuanto a conciencia de cuerpo y el Método Tomatis, y se imprime aquí con permiso (Pág. 51).

También incluido, del mismo libro "El Oído y el Lenguaje" esta el Epilogo que explica mas acerca del Método Tomatis y la Prueba de Escucha para aquellos que no estén familiarizados con el trabajo. (Pág. 55)

En Polonia, se han publicado una serie de cerca de treinta estudios acerca de patología de oído, nariz, garganta y lenguaje. Tres de los autores prepararon un articulo para esta edición de Ricochet (Pág. 75). Ellos representan un nuevo grupo de investigadores que contribuyen a nuestro entendimiento de las aplicaciones del Método Tomatis a la patología de lenguaje. También se incluye en este ejemplar, dos casos de patología de lenguaje presentados por Nicoloff de Australia (Pág. 30) y por Tatum, Oelfke y McCauley (Pág. 37) de los Estados Unidos, para ampliar la información en esta aplicación.

Otro caso es presentados por Trumps de Estados Unidos (Pág. 23) que muestra los resultados a largo plazo en una persona con lesiones severas en la cabeza. Este caso demuestra que el Método Tomatis frecuentemente expande el potencial de los cli-

entes mas allá de lo que otros creen posible.

Se incluye un resumen de un libro con los resultados de un proyecto de investigación llevado a cabo en varias Universidades de la Comunidad Europea, llamado Proyecto Lingua-Socrates. (Pág. 80)

También relacionado con el aprendizaje de un segundo idioma, es provisto por Murase, de Japón. En donde el Método Tomatis ha sido utilizado con excelentes resultados, para enseñar Ingles a estudiantes de preparatoria (Pág. 60). Se incluye también la lista de varios libros publicados en Japonés (Pág. 82).

Pueden ver, así, que los trabajos en esta edición vienen de cinco continentes: Europa, Africa, Australia, Asia y Americ a del Norte. Hemos recibido ya un numero importante de aplicaciones de Consultores Tomatis Certificados y Registrados con interés en investigación, e invitamos a investigadores externos con interés en el Método, a que participen.

Una investigación apoyada por la IARCTC se esta llevando a cabo en los Estados Unidos. El estudio investiga los resultados de la utilización de un Programa Educacional del Método Tomatis en niños normales de preescolar y primero de primaria para evaluar desarrollo de habilidades de pre-lectura. (Pág. 59). Dicho estudio puede impactar la aplicación educacional del Método Tomatis.

Han aparecido métodos derivados del Método Tomatis desde los años 70. Otros continuaran apareciendo a medida que crezcan las oportunidades de trabajo en estimulación auditiva. Este Diario da la bienvenida a estudios comparativos entre

Estos métodos y el Método Tomatis llevados a cabo por un Consultor Tomatis Certificado y Registrado. El crecimiento esperado en el campo del entrenamiento auditivo proveerá de amplio material para investigación en los próximos años.

Invitamos trabajos terminados de investigaciones, replicación de estudios, estudios comparativos, casos clínicos, desarrollo de teoría, análisis de libros y cartas al Editor. Cuando sea posible, se publicara el resumen de los artículos en uno o más idiomas además del Ingles. Invitamos cartas al Editor. La primera ha llegado (Pág. 14)

Agradezco la oportunidad de ser el primer Editor de Ricochet y agradezco a los miembros del Comité Editorial, todos los cuales han generosamente compartido su tiempo para revisar artículos, traducir y contribuir. El Diario Ricochet ha tomado vida y estamos comenzando una nueva etapa de investigación del Método Tomatis!

Dr. Billie M. Thompson, RCTC
Editor, Diario Ricochet
Presidente, IARCTC
Mayo 2004

With many thanks to our translators:
Amelia Flores-Elizondo
Valerie Drouot
Valerie Gas
Francoise Nicoloff
Joanna Ratynska
Peter Tinkl

Goals for the Tomatis Community Furthered by Journal Dedicated to the Method

First, we at Optimal Health & Learning Center want to congratulate and commend those who had the vision and took the time to make this journal a reality, and I appreciate the opportunity to have shared our findings. The Journal will be a resource for Tomatis Consultants worldwide, and through them, benefit those we serve.

In this issue, my team has presented cases in which speech therapy is augmented by simultaneous use of the Tomatis Method, and we have a speech therapist as part of our staff. I think it will benefit the Tomatis movement and the clients to have clients evaluated by audiologists, speech therapists, occupational therapists, developmental optometrists, psychiatrists, and psychologists as indicated, and to work cooperatively with these other professionals. Through this cooperative approach, the client is assured the best outcome, and other professionals learn the role the Tomatis Method can play.

We are also developing contacts with researchers in allied fields and planning cooperative studies. Our goal is to develop research protocols so that as we provide the Tomatis Method to our clients, we can collect meaningful research. We will share these protocols with others in the Tomatis community, so that we can pool our results. The Journal will play an important role as we all work together to advance the science and work of Alfred Tomatis, M.D.

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GUIDELINES FOR LETTERS. Letters discussing a recent article will have the best chance of acceptance if they are received within eight weeks of the article's publication. They should not exceed 400 words of text and five references. Letters reporting original research should not exceed 600 words and six references. All letters should include a word count. Letters must not duplicate other material published or submitted for publication. Letters will be published at the discretion of the editors and are subject to editing and abridgment. The author must state in a cover letter that he or she is the author and permits publication of the letter. Letters not meeting these specifications are generally not considered. Letters will not be returned. We prefer that letters be submitted electronically to Drbthmpsn@aol.com.

Using the Tomatis Listening Test for Research

The result of an enormous effort of a small group of dedicated individuals, Ricochet is springing forward in this 1st issue. Our warmest Thanks to Dr. Thompson and the Research Board of the IARCTC for this ground breaking endeavor. It is an honor to share the story of the Method's immersion in a multidisciplinary rehabilitation program for traumatic brain injury (TBI). In describing the Listening Tests of the client, writing the article brought to the fore front a major issue that looms large on our horizon.

I feel the IARCTC must adopt a single, uniform reporting system to describe changes that occur on listening tests so that we may:

1. Assist our professional community in future articles in Ricochet to communicate and compare change as a result of a Tomatis listening program.
2. Rate progressive change as an outcome due to participation in a Tomatis listening program.
3. Adopt a tool to communicate change for clients due to the listening program.
4. Provide the International Community with some system of comparative analysis between Tomatis listening programs for the purposes of research, quality assurance standards, and development of standardized pedagogical programs to be researched in institutional, educational, and business settings.

This is not to say that every listening center should use this system internally. Only that there should be some uniform way to communicate changes in the listening test as an organization to the outside world.

I believe that this matter is urgent enough to receive immediate attention and be communicated in the next newsletter of the IARCTC and between the committees for distribution to the entire organization. I propose that a survey of such systems used in Listening Centers be included in our second issue of Ricochet for contemplation, assessment, and analysis by the members of the IARCTC. It should be discussed and presented for a vote at our next International Assembly in Segovia in 2005. At best, the earliest time a uniform reporting system could be in use will be in our third Journal a year from now.

I thank you in advance for consideration in this undertaking and would be happy to participate in the collection of the information to help make this so.

Sincerely,
Dr. Michelle A. Trumps, DC, LOTR, RCTC
USA (504) 835-3535, FAX (504) 835-3550

Remarks About Research

Susan R. Andrews, Ph.D., RCTC,
Chair of IARCTC Research Board

ON THE EVE OF THE PUBLICation of the first professional journal dedicated to the Tomatis Method, I am honored to make some comments from the Chair about the International Association of Registered and Certified Tomatis Consultants (IARCTC) Research Board's hopes and plans for the future of the Tomatis Method and the future of the field of Sound Training.

The Research Board is one of the first standing Boards developed by the IARCTC. Our members hail from eight countries and bring varied professional backgrounds from psychology and medicine to voice and language. The Research Board has taken the position that it will stimulate and support research that has the potential to further our knowledge about the Tomatis Method of Sound Training and the new field of Sound Training in general.

Applications for new studies will be considered from IARCTC Members as well as from independent researchers. The Research Board has the authority to loan equipment to a study and to provide technical assistance to independent researchers who might not be trained in the Tomatis Method or to IARCTC members who might not consider themselves sufficiently competent in research.

In order to be considered for assistance, the proposed research must be well conceived and designed. The Research Board has a standard proposal format, which is available for download from our website, http://www.iarctc.org/. Solid research design, including random assignment of subjects to the treatment and control groups is essential. The use of proper control groups is another essential element for the study to be considered for assistance. Both qualitative and quantitative studies are encouraged and needed.

As a treatment modality that originated in Europe in the 1940s and 1950s, the Tomatis Method has not been studied extensively by independent researchers. Early proof of the Method's effectiveness was based on close observation of large numbers of patients treated by Dr. Tomatis and his co-workers. Alfred Tomatis was developing an entire new field of study, and he worked in much the same manner as that of Jean Piaget, who also worked in Paris around the same time. Tomatis and Piaget both applied their genius with a single-minded focus. Each man's life work provides an example of true experimental method; it involves detailed observations of each client's behavior and reactions, integrating the findings into a gradually evolving theory and science, and then making refinements before repeating the process. An entire Field of Sound Training and a method that reflects Tomatis' genius in the Method's complexity evolved out of this work.

As Tomatis recognized the value of his discoveries and the need to train others in what came to be known as the Tomatis Method, the early research, aimed at proving the effectiveness of the Method, began to be done and published in several countries. There have been many research studies completed and published in peer-reviewed journals; most of these by trained Tomatis Consultants, as only those would have the training in the Method and the equipment. These will be reviewed in another article, and the IARCTC Research Board is currently working on generating a comprehensive list of those articles worldwide. That list, once complete, will be published on the IARCTC website with a system for obtaining copies in place.

Why is research so needed now? There are four main areas of questions that need to be addressed, and the IARCTC

Research Board has – as a primary goal – the development of a comprehensive plan that will address these areas.

1. Almost all of the research that has been done was implemented by researchers trained in the Tomatis Method. This makes the research "suspect" by definition of the fact that the researcher was not an "independent" researcher. Thus, the inherent flaw in the "scientific method." If Colgate does the research on toothpaste, the conventional wisdom is that the results are not to be trusted as unbiased. Yet, anyone can buy Colgate toothpaste and conduct an experiment. The same is not true of Tomatis, or for many of the other Sound Training methods, for that matter. Special training is required, along with special equipment and materials, to implement a Tomatis treatment. Once someone has had that special training and even purchased the equipment to do the research, they are apparently no longer considered "independent."

The IARCTC Research Board is endeavoring to remedy this dilemma by offering loaner equipment and the expertise of the IARCTC Research Board for the design and implementation of the treatment. A fully trained IARCTC consultant can also be available to assist if one lives nearby. We are hopeful of encouraging more and varied "independent" research.

2. The Tomatis Method needs to prove its effectiveness relative to other modalities and relative to the many offshoots of the Tomatis Method. As the general public is now finally growing in its understanding and acceptance of the field of Sound Training as an important therapeutic modality, more and more there are "new offshoots" of Dr. Tomatis' historic work. Now, others want to jump on the "bandwagon," so as to speak. At the time that the Thompson and Andrews (1999) *IEEE Engineering in Medicine and Biology* article was published, at least seven extensions or methods "based on the Tomatis Method" had been identified, including Auditory Integration Training (AIT), BGC, Samonas, Joudry, Lowrey, Madaule, and Thompson. At least one of these is no longer available (BGC). AIT equipment has been seized in parts of the United States. Further, recently ASHA[1] has declared AIT as a treatment modality to be "off-limits" to its members. In addition, since the 1999 count, there are new manufacturers of equipment, such as Dr. Ron Minson, who was trained in the Tomatis Method and who makes an unsubstantiated claim that his equipment and methods are "as effective as Tomatis."

The Tomatis Method, represented by IARCTC, needs to prove its effectiveness relative to these other modalities and relative to the many offshoots of the Tomatis Method. Research comparing the relative effectiveness of different treatment modalities has rarely or never been done in a properly controlled study. For example, a comparison of the Tomatis Method with Fast ForWord or with Paul Madaule's Listening Fitness Trainer System to remediate auditory processing problems in five-year-olds would help inform treatment choices. Or, a study that helped define the most effective sequence of interventions (Tomatis > Fast ForWord versus Fast ForWord > Tomatis) for working with young autistic children would greatly assist treatment planning with such cases. A study comparing Madaule's machine, materials, and method, with Minson's machine, materials, and method, with the Tomatis' Electronic Ear – all using the same population is another example of the type of research that is sorely lacking.

3. The complexity of the Tomatis Method is a characteristic that is at once jealously guarded as "necessary and essential" by all fully trained Tomatis Consultants and it is that very complexity that is the first thing at risk once a new method of any type becomes available to the general public. One of the first things that people want to do when they copy a treatment modality is "simplify" and "reduce" the complexity of the original treatment. Some of the offshoot methods are already doing that. Dr. Tomatis had concerns about this eventual "regression to the mean" and it motivated him to try to keep the purity of the training and the Method intact. He feared that the Method would become watered down and not as effective. Unfortunately, however, studies do not exist that determine which component parts of the Tomatis Method significantly contribute to the effectiveness of the outcome and which components may be relatively unnecessary.

1. ASHA is the association representing most of the professionals (speech therapists and audiologists), who were briefly trained in AIT in the United States.

Some of the components of the Method and the specialized equipment that need to be researched include the following. The use of bone conduction in the specially designed headphones is considered a very important component to the Method's effectiveness. But, is it? There are no studies comparing equivalent groups and identical programs with the only difference being the use of bone conduction as part of the stimulation versus no stimulation. Several of the extension methods (AIT, Samonas, Joudry, Madaule) did not offer bone conduction until very recently when Dr. Tomatis' patents on bone conduction use expired.

When Tomatis first introduced the bone conduction in his equipment and method in the early 1980s, it became possible to reduce the first Intensive from 21 days of three hours a day to 15 days of two hours a day.[1] By Contrast, Joudry was describing success only when people had listened to hundreds of hours of her four tapes made from an early version of the Tomatis Electronic Ear without bone conduction.

A second special component of the Tomatis equipment is the built-in electronic gating. Many experienced Tomatis Consultants feel that this is a key component in the Method's effectiveness. But, no study has ever tested this hypothesis.

Other Tomatis professionals feel that the specially constructed tapes (now CDs) are key to the success of the treatment. These tapes have been recorded by densifying the high frequency sound on the tapes to ensure that when the music is filtered to let in high frequency sound only, that there is enough sound to properly stimulate the ear and the brain's high frequency receptors. However, there are no studies to show that this is truly an important component.

There are many other questions about which components of the equipment are essential to the Tomatis Method's effectiveness. There are also questions about which parts of the treatment program are essential for effectiveness. Again, these issues have never been put to experimental test. For example, how many hours (intensity of 30 hours, 60 hours, 90 hours, etc.) of Tomatis sound stimulation need to be given to individuals of different ages, with different types of problems (autism vs. language delay only vs. auditory processing problem) in order for the necessary or desired result to be obtained.

The Tomatis Method has both passive and active phases. Are both required for success? Dr. Tomatis originally had only "active" sessions in which the patient worked with a microphone to hum and repeat songs and words and phrases.

Does Gregorian Chant need to be used in the program? How long should the treatment continue and is it essential to allow breaks in between intense daily treatment sessions? Tomatis originally used breaks of 3 to 4 weeks as an integration period.

In fact, the program has changed quite a bit over the years while the professor was actively developing it. The actual program of sound/music stimulation that is written is another extremely complex variable in the Method and one that many research studies could be aimed at explaining.

Also, many of the Tomatis professionals use Dr. Tomatis' Listening Test as a way to design individualized programs of stimulation for each client. The Listening Test is similar to an audiogram but very different in that it is active listening perception that is being measured. The Listening Test has never been standardized and validated with other measures. Much work needs to be done on this set of variables as well.

4. And lastly, there is the question of whether or not it is the Mozart music itself that is responsible for the changes, rather than the equipment and the complex developmental method of treatment. This has become the source of much controversy in the wake of University of California at Irvine researchers' popular-press reports of the "Mozart Effect." In fact, the Mozart Effect is poorly understood, misquoted, and incorrectly confused with the Tomatis Method. The UC Irvine study reports a transitory effect of 10 to 15 minutes on only one area of ability – that of spatial-temporal reasoning – which resulted from kindergarten children listening to 10 minutes of one specific early Mozart piano concerto (K.448, Sonata in D for 2 pianos), played in the room without special equipment. The children showed a 10 to 15 minute advantage, which was only significant for the Object Assembly subtest

1. Nicoloff, Françoise. Personal Communication. February 2004.

from the WPPSI-R Performance IQ scales. Further, there has been some inconsistency in other researchers' ability to reproduce that effect.

In summary, as the Chairman of the Research Board of the International Association of Registered and Certified Tomatis Consultants, the advent of this new Journal signals the time for everyone to start thinking about ways in which the Tomatis Method can be more fully researched. The Method is rich and amazingly complex. Those of us who have been privileged to learn from and/or work with Dr. Alfred Tomatis appreciate what a complex man he was. On the one hand, Dr. Tomatis openly criticized the way research could be designed to prove most anything a researcher wanted to prove. On the other hand, his primary personal contribution to the world was his careful experimentation, his faithful observations and recording of results, and his continual changing of the Method and the equipment in an effort to continue to improve it. Dr. Tomatis was a genius and a dedicated researcher.

I challenge all Tomatis Consultants and researchers in the field of Sound Training generally to roll up their sleeves and start to systematically address these questions. The future of the field of Sound Training, all of which was fathered by Dr. Alfred Tomatis, depends on it.

May 15, 2004
Susan R. Andrews, Ph.D., RCTC
Clinical and Developmental Neuropsychologist
Chair, Research Board, IARCTC

Remarques à propos de la recherche

Susan R. Andrews, Ph.D., RCTC,
Présidente du Comité de Recherche de l'IARCTC

A la veille de la publication du premier journal professionnel dédié à la Méthode Tomatis, je suis honorée d'apporter mes commentaires, en tant que présidente du Comité de Recherche de l'Association Internationale des Consultants Tomatis Inscrits Certifiés, concernant les espoirs et les plans pour le futur de la Méthode Tomatis et de l'entraînement par la stimulation sonore.

Le Comité de Recherche est un des premiers Comités mis en place par l'IARCTC. Nos membres viennent de huit pays et possèdent des formations et des expériences professionnelles variées, de la psychologie et la médecine à la voix et au langage. Le Comité de recherche s'est fixé comme objectif de stimuler et d'apporter son soutien aux recherches qui peuvent faire avancer notre connaissance de la Méthode Tomatis et du nouveau champ de l'entraînement par la stimulation sonore en général. Ces projets peuvent émaner de membres de l'IARCTC comme de chercheurs indépendants. Le Comité de Recherche a autorité pour procurer un équipement ou apporter une assistance technique aux chercheurs indépendants qui n'auraient pas été formés à la Méthode Tomatis ou aux membres de l'IARCTC qui ne se sentiraient pas qualifiés pour entreprendre seuls une recherche.

Pour être retenus par le Comité, les projets doivent répondre à un certain nombre d'exigences de qualité, notamment en ce qui concerne leur conception.

Le Comité de Recherche a conçu à cet effet un exemple de projet standard, qui peut être consulté et téléchargé à partir de notre site Web http://www.iarctc.org/.

Une conception solide de la recherche, incluant l'affectation au hasard des sujets dans les groupes de traitement et de contrôle, est essentielle. L'utilisation de groupes de contrôle appropriés constitue un autre élément essentiel d'un projet postulant pour obtenir l'aide du Comité. Tant les études qualitatives que quantitatives sont encouragées et nécessaires.

Mode de traitement apparu en Europe dans les années 1940 et 1950, la Méthode Tomatis n'a pas été étudiée de manière extensive par des chercheurs indépendants. Les premières preuves de l'efficacité de la Méthode étaient basées sur l'observation minutieuse d'un grand nombre de patients traités par le Docteur Tomatis et son équipe. Alfred Tomatis a développé un champ d'étude entièrement nouveau, et il a travaillé d'une manière très similaire à celle de Jean Piaget, qui se trouvait à Paris à la même époque. Tomatis et Piaget ont tous deux employé leur génie avec une détermination absolue. Pour chacun de ces hommes, le travail de toute une vie nous apporte un exemple de vraie méthode expérimentale, construite autour de l'observation détaillée des réactions et du comportement de chaque client, intégrant les résultats dans une théorie scientifique évoluant graduellement et bénéficiant de perfectionne-

ment avant une nouvelle expérimentation. De ce travail est né le domaine de "l'entraînement par la stimulation sonore" et une méthode qui reflète la complexité du génie de Tomatis.

Lorsque Tomatis reconnut la valeur de ses découvertes et la nécessité de former d'autres personnes à ce qui en vint à être appelé la Méthode Tomatis, la recherche du début, qui tendait à prouver l'efficacité de la Méthode, commença à être publiée et appliquée dans de nombreux pays. A partir de là, de nombreuses études ont été accomplies et publiées dans des revues spécialisées, la plupart étant le fait de Consultants Tomatis, puisque ils étaient les seuls à être formés et à avoir un équipement.

Cela sera abordé dans un autre article et le Comité de Recherche de l'IARCTC travaille actuellement sur la production d'une liste détaillée de ces articles du monde entier. Dès qu'elle sera complète, cette liste sera publiée sur le site Internet de l'IARCTC et un système sera mis en place pour obtenir des copies de ces articles.

Pourquoi a t-on tant besoin de la recherche en ce moment ? Il y a quatre grands domaines d'investigation qui doivent être abordés et le Comité de Recherche de l'IARCTC a, pour but principal, le développement d'un projet global qui abordera ces domaines.

1. Presque toute la recherche qui a été effectuée jusqu'à présent fut accomplie par des chercheurs formés à la Méthode Tomatis. Cela rend la recherche “suspecte” par définition car les chercheurs n'étaient pas “indépendants”. Voici donc le défaut inhérent à la "méthode scientifique". Si Colgate fait de la recherche sur le dentifrice, la sagesse traditionnelle veut que les résultats ne soient pas fiables car partiaux. Pourtant, quiconque peut acheter du dentifrice Colgate et faire une expérience. Cela n'est pas vrai pour Tomatis, ou pour nombre des autres Méthodes de Traitement par la stimulation sonore d'ailleurs. Une formation spéciale est nécessaire, ainsi qu'un équipement et un matériel spécifiques, pour mettre en place un traitement Tomatis. Or, dès que quelqu'un a suivi une formation spéciale et éventuellement acheté l'équipement pour faire de la recherche, il n'est apparemment plus considéré comme “indépendant”.

Le Comité de Recherche de l'IARCTC s'efforce de remédier à ce dilemme en mettant à disposition des chercheurs un équipement et les compétences du Comité de Recherche de l'IARCTC pour la conception et la mise en place du traitement. Un Consultant Tomatis entièrement formé à la Méthode pourra également être disponible pour apporter son assistance. Nous espérons encourager davantage de recherches "indépendantes" et que celles-ci soient plus variées.

2. La Méthode Tomatis a besoin de démontrer son efficacité par rapport aux autres modes thérapeutiques et aux nombreuses ramifications de la Méthode Tomatis. Puisque se développent enfin la connaissance et l'acceptation par grand public de l'entraînement par la stimulation sonore en tant que mode thérapeutique important, il y a de plus en plus de "nouvelles ramifications" du travail du Dr Tomatis. Maintenant, d'autres veulent "prendre le train en marche", pour ainsi dire. A l'époque où fut publié l'article IEEE d'Ingénierie en Médecine et Biologie de Thompson et Andrews (1999), au moins sept extensions ou méthodes "basées sur la Méthode Tomatis" furent identifiées, cela comprenait les méthodes : Auditory Integration Training (AIT, Thérapie d'Intégration Auditive, d'après Bérard), BGC, Samonas, Joudry, Lowrey, Madaule, et Thompson. Au moins une d'entre elles n'existe plus (BGC). L'équipement de l'AIT a été saisi dans certaines parties des Etats-Unis. En outre, l'ASHA[1] a récemment déclaré à ses membres que l'AIT était un mode de traitement "en dehors des limites" c'est-à-dire non autorisé. De plus, depuis le recensement de 1999, il y a de nouveaux fabricants d'équipement, comme le Dr. Ron Minson, qui fut formé à la Méthode Tomatis et qui revendique, et cela sans fondement, que son équipement et ses méthodes sont "aussi efficaces que Tomatis".

Une recherche comparant l'efficacité relative de différents modes de traitement n'a que rarement ou même jamais été menée dans une étude appropriée. Par exemple, une comparaison entre la Méthode Tomatis et Fast ForWord ou avec le Système de Fitness pour l'écoute de Paul Madaule (Listening Fitness Trainer System) dans

1. L'ASHA est l'association représentant la plupart des professionnels (orthophonistes et ORL), dont certains membres furent brièvement formés à l'AIT aux Etats-Unis.

le traitement des problèmes de développement auditif chez les enfants de 5 ans aiderait à informer sur les choix de traitement. Ou bien, une étude contribuant à définir l'enchaînement d'interventions le plus efficace (Tomatis > Fast ForWord ou Fast ForWord > Tomatis) lors du travail avec les jeunes enfants autistes aiderait grandement la planification des traitements dans ce genre de cas. Une étude comparant la machine, le matériel et la méthode de Madaule avec la machine, le matériel et la méthode de Minson, avec l'Oreille Electronique de Tomatis – et utilisant toutes la même population, est un autre exemple du type de recherche dont nous manquons cruellement.

3. La complexité de la Méthode Tomatis a toujours été considérée jalousement comme étant “nécessaire et essentielle” par tout Consultant Tomatis formé à la Méthode et c'est cette complexité qui est la première mise en danger dès qu'une nouvelle méthode est disponible pour le grand public. Une des premières choses que les personnes souhaitent faire quand elles copient un mode de traitement est de "simplifier" et "réduire" la complexité du traitement original. Certaines méthodes parallèles le font déjà. Le Dr. Tomatis était inquiet à propos de cette éventuelle “régression vers le misérable” et cela le motivait pour essayer de préserver l'intégrité de la formation et de la Méthode. Il craignait que la méthode soit édulcorée et moins efficace. Malheureusement, cependant, il n'existe pas d'études déterminant quels composants de la Méthode Tomatis contribuent de manière significative à l'efficacité du résultat et quels composants seraient relativement superflus.

Les composants de la Méthode et de l'équipement spécialisé devant faire l'objet de recherche sont à mon sens les suivants. L'utilisation de la conduction osseuse dans les écouteurs spécialement conçus pour notre application est considérée comme un élément très important dans l'efficacité de la Méthode. Mais est-ce réellement le cas ? Il n'y a pas d'études comparant des groupes équivalents recevant des programmes identiques dont la seule différence serait l'utilisation de la conduction osseuse. Plusieurs méthodes parallèles (AIT, Samonas, Joudry, Madaule) n'utilisaient pas la conduction osseuse jusqu'à l'expiration très récente des brevets sur la conduction osseuse du Dr. Tomatis.

Quand Tomatis introduisit pour la première fois la conduction osseuse dans son équipement et sa méthode au début des années 1980, il fut possible de réduire la première session intensive de 21 jours à raison de 3 heures par jour à 15 jours à raison de 2 heures par jour[1]. En comparaison, Joudry ne décrivait de succès qu'après seulement des centaines d'heures d'écoute de ses quatre cassettes faites d'après une version antérieure de l'Oreille Electronique sans conduction osseuse.

Un second élément spécifique de l'équipement Tomatis est la bascule électronique intégrée. De nombreux Consultants Tomatis expérimentés pensent que c'est un composant clé dans l'efficacité de la Méthode. Pourtant, aucune étude n'a jamais été menée pour vérifier cette hypothèse.

D'autres professionnels Tomatis pensent que les cassettes (et maintenant les CD) spécialement conçues pour la Méthode Tomatis sont la clé du succès du traitement. Ces bandes furent enregistrées en densifiant les hautes fréquences pour conserver suffisamment de son pour stimuler convenablement l'oreille et les récepteurs de hautes fréquences du cerveau lorsque la musique est filtrée pour laisser passer uniquement les hautes fréquences. Cependant, il n'y a pas d'étude prouvant que c'est un composant réellement important.

Il y a beaucoup d'autres questions à propos des composants de l'équipement essentiels à l'efficacité de la Méthode Tomatis. De même, il importe de savoir quelles parties du programme sont essentielles en termes d'efficacité. Une nouvelle fois, ces interrogations n'ont jamais fait l'objet de tests expérimentaux. Par exemple, combien d'heures (30 heures, 60 heures, 90 heures, etc.) de stimulation par le son Tomatis sont nécessaires pour des individus d'âges différents, avec des types de problèmes différents (l'autisme par rapport à un retard de langage comparé à un problème de développement auditif) pour que les résultats nécessaires ou désirés soient obtenus.

La Méthode Tomatis comporte à la fois des phases passives et actives. Sont-elles toutes deux nécessaires pour la

1. Nicoloff, Françoise. Communication Personnelle. Février 2004.

réussite ? A l'origine, le Dr. Tomatis proposait uniquement des sessions "actives" pendant lesquelles le patient travaillait avec un microphone pour émettre des sons et répéter des chants, mots et phrases.

Doit-on nécessairement utiliser les Chants Grégoriens dans le programme ? Combien de temps devrait durer le traitement et est-il essentiel d'autoriser des pauses entre les sessions intensives ? A l'origine, Tomatis faisait faire des pauses de 3 à 4 semaines comme période d'intégration.

En fait, le programme a changé quelque peu au fur et à mesure des années pendant que le professeur le développait activement. Le programme actuel de stimulation par le son et la musique est une autre variable extrêmement complexe de la Méthode et des études pourraient être prévues pour l'expliquer.

De même, de nombreux professionnels Tomatis utilisent l'appareil de test du Dr. Tomatis comme un moyen de concevoir les programmes de stimulation individualisés pour chaque client. L'appareil de test ressemble à un audiogramme mais est très différent car c'est la perception active de l'écoute qui est mesurée. L'appareil de test n'a jamais été standardisé ni validé par d'autres mesures. Il reste aussi beaucoup de travail sur ce groupe de variables.

4. Enfin, la musique de Mozart elle-même est-elle ou non responsable des changements, plutôt que l'équipement et la méthode complexe de traitement de croissance. Cela est devenu la source d'une grande controverse à la suite d'articles de presse populaire sur l'étude "l'Effet Mozart" effectuée par les chercheurs d'Irvine à l'Université de Californie. En fait, l'Effet Mozart est mal compris, cité inexactement et confondu incorrectement avec la Méthode Tomatis. L'étude Irvine de l'Université de Californie rapporte un effet transitoire de 10 à 15 minutes sur seulement un domaine d'aptitude – celui du raisonnement spatio-temporel. Cette étude a porté sur des enfants en maternelle écoutant 10 minutes d'un concerto pour piano de jeunesse de Mozart (K. 448, Sonate en ré pour 2 pianos), joué dans la salle sans équipement spécial. Les enfants ont montré un gain de 10 à 15 minutes, qui fut seulement significatif pour le sous-test d'Assemblage d'Objet des échelles de Performances de QI de WPPSI-R. De plus, il y eut une certaine inconsistance dans la capacité des chercheurs à reproduire cet effet.

En résumé, en tant que Présidente du Comité de Recherche de l'Association Internationale des Consultants Tomatis Inscrits Certifiés (IARCTC), l'apparition de ce nouveau journal est le signe qu'il est temps pour tous de commencer à penser aux différentes façons dont la Méthode Tomatis peut être l'objet de recherches approfondies. La Méthode est riche et étonnamment complexe. Ceux d'entre nous qui furent privilégiés et qui se formèrent ou travaillèrent avec le Dr Tomatis savent quel homme complexe il fut. D'une part, le Dr. Tomatis critiquait ouvertement la manière dont une recherche peut être conçue de façon à prouver tout ce souhaite un chercheur. D'autre part, sa contribution personnelle au monde fut son expérimentation minutieuse, ses observations fidèles, l'enregistrement de ses résultats, les changements constants de la Méthode et de l'équipement dans son effort à continuer de l'améliorer. Le Dr. Tomatis était un génie et un chercheur dévoué.

Je demande à tous les Consultants Tomatis et à tous les chercheurs oeuvrant dans le domaine de l'entraînement par la stimulation sonore de remonter leurs manches et commencer à poser systématiquement ces questions. Le futur de notre travail, de tout ce qui a été créé par le Dr. Alfred Tomatis, en dépend.

15 mai 2004
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Traduction Valérie Drouot, RCTC

Tomatis Method: Integrator of Rehabilitation in a Traumatic Brain Injury (TBI) Case Study

Michelle Trumps, DC, LOTR, RCTC

ABSTRACT

The Tomatis Method (TM) is demonstrated to be a powerful adjunct to a comprehensive rehabilitation program in the treatment of traumatic brain injury. This case study outlines the problem list, goals, treatment plan, and outcome of a client successfully treated utilizing an extended Tomatis Program as a part of his outpatient rehabilitation program.

T.R. participated in a comprehensive therapy program which included sensory motor integration, neuromuscular re-education, cranial sacral therapy, psychological counseling, relaxation training, cognitive retraining, vocational retraining, and the Tomatis Method of Sound Therapy at a decreasing frequency from three times per week to three times per month for 36 months. T.R. took a single point landing on his head from 30 feet, recovered from a coma, but could not get out of the bathtub or drive. It is extraordinary that T.R. became a certified computer network technician, gainfully employed and making comparable pay, riding in his boat and fishing once again, repairing his own car and tinkering with others' by following this program.

While traditional therapies alone may have been able to get this man back to the work force in a lower functional capacity than prior to his injury, it appears that the quality of his life and his healing rate were accelerated by the inclusion of the Tomatis Method in his rehabilitation program. Clinical observations and qualitative shifts demonstrated by the listening tests bear evidence of a fundamental shift in the neurological processing of this gentleman toward modulation. These, coupled with the frank shift of ear dominance, are profound enough changes to warrant further investigation.

INTRODUCTION

Althea Gelpi, Nurse Case Manager (who had experienced the benefits of the Tomatis Method after a series of automobile accidents with a mild head injury) approached Dr. Susan Andrews, Clinical Neuropsychologist, coordinator and developer of the Center for Head Injury Rehabilitation, to develop and coordinate a multi-disciplinary team for T.R., who had experienced a significant head injury following electric shock while working for a sign company. A team of professionals was pulled together, each providing a vital link in the rehabilitation process.

Dr. Andrews headed the team of professionals and coordinated the cognitive rehabilitation process. Listening training, cognitive rehabilitation activities, sensory motor integration, cranial sacral therapy, and neuromuscular re-education activities were provided as outlined in this case study by Dr. Michelle Trumps, DC, LOTR. Dr. Steve Thompson, EDD, LPC, provided weekly counseling with T.R. Highlights of this treatment were significant in assisting T.R. to clearly identify his work limitations and adjust his goals. Sessions with Dr. Thompson also assisted T.R. to adjust to the limitations of his injury and the potentials in his future. Dr. Cindy Ashkins, DSW, provided Imago Relationship Therapy to T.R. and his partner. Keith Thompson, LMT, provided neuromuscular massage and additional soft tissue work. Vocational Rehabilitation was provided by Barney Hedgewood and coordinated by Ms. Gelpi.

Traditionally, following TBI outpatient programs, the rate of return to work is poor. Referral to vocational training and rehabilitation programs is slow. Tashjian and Hayward (1993) found that voca-

tional training was significantly delayed for persons with traumatic brain injuries, averaging seven years post-injury among 2,700 cases reviewed. (1) Dikmen and colleagues (1994) found that among patients with severe brain injuries who had been employed before their injuries, only 37 percent were employed two years later. (2) A study by Virginia Medical School found that seven years post injury, one in three TBI patients were found to be employed in lower paying, less competent positions. (3).

The treatment team felt that it could provide an immersion program that would address the physical, emotional, cognitive, and vocational needs of T.R. within a reasonable timeframe. It was felt that at the end of this program, his total rehabilitation program and his long term care needs would fall below the average lifetime cost of an individual suffering from TBI, found by a National Institute of Health panel in 1998 to be between $600,000 and $1.9 million.

Because of their extensive experience in traumatic brain injury rehabilitation and their joint interest in the New Orleans Listening Center, Dr. Andrews and Dr. Trumps proceeded to integrate the Tomatis Method into T.R.'s program in an effort to accelerate his recovery. This effort was fully outlined to the insurance company and supported by the employer.

It is felt that quality of life and healing rate were accelerated by the inclusion of the Tomatis Method in the rehabilitation program. T.R. was admitted to this comprehensive rehabilitation program six months following his injury. Within the 36 months that followed, T.R. was able to regain command of his life by resuming his ability to drive, by passing multiple examinations in an extensive certification process, and by becoming gainfully employed. Throughout the course of treatment, T.R. reclaimed some ability to repair small engines, to maintain his car, and to assist his family with light construction needs and their car repair on a limited basis. Leisure activities ensure a person's quality of life, and T.R. was able to enjoy such activities as riding in his boat and fishing.

HISTORY

T.R. is a 25-year-old electrician who fell from a ladder following an electric shock while working on a bank sign. This gentleman made a pinpoint landing headfirst on the right side of his head from nearly 30 feet in the air. CPR was delivered and he was resuscitated at the scene. He was in a coma for 48 hours. Incongruently, he was discharged from the hospital eight days later. There were multiple fractures to the right wrist, right eye orbit and maxillary bones, requiring reconstructive surgery on an outpatient basis before being admitted to The Tomatis Method program six months later.

When he returned home, he walked with an unsteady gait and had difficulty getting into and out of the bathtub. He took several falls. He was fearful that he would never work again and that he would not be able to provide for a family when that time came. He was unable to drive due to seizure activity and balance and visual tracking problems.

In addition to his employment as an electrician, T.R. repaired small machines and automobiles. He served in the Army during the crisis in Kuwait in 1991. Prior to the injury, he was an active and agile athlete who trained for the Tour de France while stationed in Europe. He was an avid snow skier. He spent long hours on his boat fishing. There was no additional significant medical history.

INITIAL PROBLEM LIST

1. Face: Decreased muscle tone in the mouth with difficulty holding food and liquids on the right side. Paralysis on the right side of the face in facial movements and extra-orbital edema. Inability to elevate the right eye or isolate right eye movements from the left, such as winking.
2. Headaches: Tegretol for seizure disorder, localized, instant on right side, and generalized headache on stress.
3. Intrinsic muscle atrophy in the right-dominant hand with pitting edema at the wrist, decreased range of motion, and weakness to the shoulder.
4. Hypersensitivity to facial and right upper extremity tactile stimuli.
5. Visual motor tracking, coordination deficits: Diplopia in static vision, and also in tracking at left and right of midline. Eyestrain and significant saccadic movements in horizontal, vertical, diagonal, and rotational planes.
6. Visual perception deficits: Latency response and kinesthetic processing of visual information noted. Reversals present. T.R. missed the sequencing order and number of repetitions 8:8 attempts on a bilateral motor coordination test

of visual memory of movement and of the ability to plan motor activity with visual input. He also had difficulty with reversals in a vertical plane (installed a light switch upside down).

7. Auditory function: Constant tinnitus, requiring use of a fan at night to drown out the noise so he could sleep. Significant hearing loss in the left ear requiring a hearing aid. Difficulty with focusing and filtering functions of the ear, screening out and differentiating the source of background environmental noise from stimulus.
8. Auditory perception: Auditory reversals, misinterpreting sounds and instruction, difficulty determining the source and direction of stimulus. (He asked if there was some form of auditory dyslexia.)
9. Vestibular (movement) perception: Deficits present in the vestibular system (responsible for orientation of the body in space, proprioception, body image, spatial relations, perception of movement and time). Nystagmus tests revealed greater excursion of the eyes and pronounced nausea following rotation to the left. A slight nystagmus at rest increased when his gaze widened. Adaptation to sleep in waterbed required.
10. Balance: Normal static standing balance with eyes open. Weaving and was inability to correct or maintain balance with eyes closed. Anxiety and lack of coordination in the testing. Lacked ability to use arms to balance while standing on either foot. Leaned to the right side when standing on the right side, accentuating the tilt and causing loss of balance without the ability to extend his arm to protect himself from injury. Had difficulty stepping into and out of his bathtub, moving around furniture and through doorways, falling on three occasions prior to initiation of treatment.
11. Self care: Greater effort and more time required for basic hygiene, simple household tasks, and light car maintenance. Inferior quality work is reported. He separates money into envelopes to ensure he has the cash to pay his bills. He has difficulty with tool use and puzzles. It took him six hours to change the brakes on his car and he said he had parts leftover.
12. Cranial sacral therapy assessment: Diminished and unbalanced excursion of cerebral spinal fluid rhythm. Diminished mobility of the right occipital plate at the suture. Bilateral temporal lobe asymmetry. Edematous sinus under the right eye with positional tearing of the eye. Adhesions noted in the sphenoid, temporal mandibular joint and frontal plate sutures.
13. Cognition: Impaired organization, planning, attention, concentration, memory, and executive function.
14. TOVA: A high level of inattention and impulsivity as well as a significant delay in processing time demonstrated by The Test of Variables of Attention. A summary of TOVA measures and the course of the findings found in Table 1 are significant indicators of the outcome of treatment.
15. The Tomatis Listening Test: Given monthly. A full description of the tests and program are found in the Listening Program section as they are significant indicators of the complete outcome of treatment.

GOALS AND TREATMENT PLAN

A four-phase treatment plan was established to integrate the complexities of his clinical picture. The goal and focus of each phase is highlighted below, followed by a list of modalities used throughout the entire treatment plan.

Table 1: TOVA Scores Over Duration of Treatment

Phase	RSM	RSM	ASM	ASM	Actives	Actives	Actives	Actives
Date	6/95	7/95	9/95	10/95	12/95	5/96	6/96	5/97
Inattention	128	61	70	75	255	84	57	44
Impulsivity	41	44	44	44	45	42	44	37
Time	108	84	113	90	84	70	77	54
Variability	113	83	109	116	97	79	90	65

Phase 1 Goal: Normalize basic sensory information.

Three-to-five-hour treatment days were provided two to three times per week for eight months. T.R. participated in a comprehensive sensory motor integration training program to normalize the auditory, visual, vestibular, and tactile sensory systems. Activities were provided to reorganize basic sensory information, improve the ability to process sensory information (filter, screen, and focus) and improve attention, concentration, and memory.

Phase II Goal: Normalize perceptual motor awareness.

Three-to-five-hour treatment days were provided one to two times per week for eight months. These integrated perceptual motor skills and strategies to organize new learning, improve speed of information processing, as well as instruction in strategies to improve time and money management, work simplification, body mechanics, and safety.

Phase III Goal: Community reintegration with vocational re-education.

One-to-three-hour treatment days were provided two to four times per month for six to eight months in addition to vocational rehabilitation evaluation, consultation, and training. During this phase, T.R. was to resume the independent living skills of driving and shopping. In preparation for vocational training, we also initiated prevocational training with hobbies of small engine mechanics, car repair, followed by evaluation of T.R.'s potential to return to work as an electrician.

Phase IV Goal: Return to work and independent living.

One-to-three-hour treatment days were provided one to four times per month for six to ten months to augment and support the vocational rehabilitation process. Executive strategies of problem solving and planning were provided to plan learning strategies and to understand course content. We addressed the physical difficulties associated with the demands of training in preparation to return to work, as well as the perceptual and cogni-

Table 2: Listening Test Responses Over Duration of Treatment

Date	5/30/95	9/11/95	11/7/95	1/24/96	6/25/96
Phase	RSM	Pre ASM	Post ASM	Actives (375)	Actives (625)
Ear Dom/db	Left 15 db	Left 15db	Left 10db	Right 15db	Right 15db
Selectivity	Open	Open	Open	Closed R6000hz	Open
Bone Err L/R	0 / 5(!)3(?)	1(!)1(?) /3(!)5(?)	1(?) / 5(!)3(?)	0 / 4(!)2(?)	0 / 3(!)2(?)
Air Err L/R	0 / 11	10 / 8	4 / 3	0 / 0	0 / 5
Crossover L/R	None	None	9 RUE / 2LUE	1RUE / 3LUE	None
Air Avge L	50db	50db	50db	50db	55db
Spike db hz L	40db 125hz	40db 750hz	40db 1500hz	35db1000/1500hz	35db 750hz
Dip db hz L	60db 4-8000hz	65db 6000hz	60db 4-8000hz	50db 2000hz	70db 8000hz
Quality/Transition	Smooth	Dx15db 4000hz	Smooth	Dx10db 4000hz	Smooth
Air Avge R	30db	20db	15db	15db	15db
Spike db hz R	20db 3000hz	5db 3000hz	5db 3000hz	0db 3000hz	5db 3000hz
Dip db hz R	35db 2000hz	25db 6000hz	25db250/6000hz	20db 6000hz	20db 2000hz
Quality/Transition	SPx15db2000hz	SPx15db 2000hz	SPx10db 2000hz	Smooth	Smooth
BoneAvge L	20db	20db	20db	20db	25db
Spike db hz L	15db 4000hz	10db1500/4000hz	15db1500/3000hz	15db1500hz	None
Dip db hz L	30db 250hz	25db 2000hz	25db1000/2000hz	30db1000/2000hz	30db 1500hz
Quality/Transition	Wide1500-4000	Wide 2000-4000	Smooth	Wide 2000-4000	Dip 1500hz
BoneAvge R	15db	15db	25db	15db	20db
Spike db hz R	10db 1000hz	None	20db 3000hz	-5db 3000hz	10db 4000hz
Dip db hz R	30db 2000hz	30db 2000hz	40db 2000hz	35db 2000hz	30db 2000hz
Quality/Transition	JSx25db 750hz	Dx15db 1500hz	Dx20db 1500hz	SPx35db2000hz	Dx10db1500hz

tive difficulties with the demands of independent living and return to work.

MODALITIES

1. Sound sensory integration of auditory, visual, vestibular, and tactile systems, using the Tomatis Method and activity based therapy for two hours per treatment as tolerated.
2. Sequencing and motor planning activities to augment cognitive gains, organization and executive strategies.
3. Cranial sacral therapy to normalize the cerebral spinal fluid rhythm and the movement of the sphenoid, temporalis, occipital, and frontal plates.
4. Neuromuscular re-education to improve the ability of the sinuses to drain and the motor function of the right face, eye, mouth.
5. Myofascial release and re-education of right upper extremity neck and back.
6. Vestibular stimulation incorporated with physical and mental sequencing activities to improve motor planning skills. Sustained, filtered, divided, and alternating attention and concentration training.
7. Instruction in relaxation training and coping mechanisms to maintain and augment cognitive improvement and psychological gains.
8. Driving assessment.
9. Preliminary vocational training for realistic goal setting, time management, planning, organization, work simplification, and money management. Body mechanics training in the arenas of leisure and household activities.
10. Vocational assessment.
11. Problem solving skills, adaptation to challenges, and learning skills training.

TOVA SUMMARY

It is well known in cognitive rehabilitation that attention is a strong indicator of frontal lobe functional integrity and healing in TBI. Attention and concentration are cognitive functions that are early indicators of TBI and are known to be one of the last to reorganize in the rehabilitation process. (4)

The Test of Variables of Attention was implemented throughout T.R.'s treatment to track cognitive reorganization. It is a twenty-three minute continuous performance test that measures Inattention, Impulsivity, Response Time, and Variability. It has no learning curve, so each test is a fresh assessment of these variables. Table 1 tracks TOVA scores. A T-Score of 50 is equivalent to the standard deviation score of 100. The T-Score distribution has a mean of 50 and a standard deviation of 15. Scores from 40T to 65T are considered within normal limits. Over 65T is abnormal.

TOVA Score Summary

In a study presented by Trumps and Andrews to the Congres Tomatis International, Neuchatel, Switzerland, October, 1995 based on data collected in their Listening Center, significant trends were identified using the TOVA that are felt to be key markers of change when used with the Listening Test to determine the client's programming needs. (5)

T.R.'s TOVA scores reflect several trends of the Listening Program. Inattention and response time improved to normal over the course of treatment. Patient variability scores wobbled repeatedly until nearly normalizing in May of 1997. The domain of Impulsivity never wavered from normal scores.

The domain of Inattention improved remarkably after the onset of the program and during the RSM. At the ASM, Inattention became slightly disorganized. The ASM was performed only with a balance shift from 10 to 8 because of seizure precautions. Inattention became completely disorganized with the introduction of shifts in the balance of the program starting in March. Balance was shifted from 8 to 5 until May of 1996 and the Inattention domain improved. In June of 1996, balance was shifted even further between 7 and 3 and Inattention completely normalized and continued to improve throughout the program.

LISTENING PROGRAM DESCRIPTION

No guidelines have yet been established by Ricochet to describe the results of listening tests and the Tomatis Method program protocols. Table 2 depicts the trends of changes observed in the series of listening tests. Trends between phases are easily demonstrated by a left-to-right visual scan of the chart. By grouping the variables of Air & Bone Conduction Listening Threshhold averages, Spike, Dip, and Quality, the reader can compare like curves in each ear (Left Air to Right Air, Left Bone to Right Bone).

A significant finding in the case of T.R. has been tracked at the New Orleans Listening Center, but

was not identified by Dr. Tomatis as a listening test variable. It is the use of the opposite arm to correctly indicate the ear in which the stimulus was provided. This is present when the dyslexic individual begins to shift laterally toward right dominance and more consistent laterality organization. It is included here because its appearance exactly coincides with T.R.'s laterality shift toward right ear dominance.

The Listening Test Table Legend

Bone Errors are identified with (!) indicating a frank error and (?) indicating uncertainty or a "both" response. Air Errors is a sum of the actual "x" on the graph.

The "Average" value is an actual figure rounded to the nearest factor of 5. "Average Air" is determined by adding the Air decibel values, dividing by 11. "Average Bone" is determined by adding the Bone decibel values, dividing by 8.

Decibel Values are actual values as listed on the listening test graph except for the Decibel Values listed on the Quality/Transition Rows. Decibels listed in the Quality/Transition Rows are the relative change in decibel values.

The Quality of the Curves is described as follows:

Wide is a drift between air and bone conduction indicated in low frequency (125-500 Hz) or high frequency (2000-4000 Hz) ends of the graph.

Smooth is average 5db-10db changes especially in communication ranges .

Spike (SP) or Dip is less than a Smooth curve. A Spike (Lower Volume but Up on the Graph) and Dip (Higher Volume but Down on the Graph) = >10db change. It is judged by how it looks on the graph .

Jagged means More than one Spike or Dip or Combination db change of >10db.

IS means an additional Spike from decibel listed at the frequency (JS 25db 750Hz).

ID means an additional dip from decibel listed at the frequency listed. An additional frequency may be added to give a better picture of the curve.

Programming Summary:

A developmental Tomatis Method program was administered over a total of a period of 36 months and included 675 thirty-minute sessions. Specific parameters were very gradually adjusted in T.R.'s program because of seizure activity and significant imbalance observed on the listening tests.

Interesting evolutions noted in the Listening Test were indicated on Table 2 by the word "Crossover." After the ASM and as the shift from left ear dominance to right ear dominance occurred, it appeared that the bridge built in the dominance transition was demonstrated by the use of the opposite hand to indicate a response to AIR conduction stimuli. This interesting piece of data occurred exactly at the onset of a more aggressive adjustment of balance following the ASM and until T.R. measured right Ear Dominance by 15 decibels, supporting what Tomatis Method practitioners have long clinically experienced. Dyslexia is a laterality issue that can most immediately be treated through a shift of ear dominance.

RESULTS

Dr. Tomatis postulated that one can affect the entire nervous system through the auditory apparatus. Drs. Andrews and Thompson describe in detail a triad of neurological integration through specific neurological pathways that feed and modulate vestibular, visual, and linguistic processing. (6)

The cranial nerves may benefit by sheer proximity of the stimulation in the Tomatis Method program. The optic, occulomotor, trochlear, abducens, and spinal accessory nerves (6) in their proximal physical location on the pons are millimeters from the facial and acoustic nerve. Thus, in this case study, stimulation from the Tomatis Method program is regarded as a significant contributor toward normalized tactile sensation, motor control, and facial symmetry. At the termination of T.R.'s rehabilitation program some nerve damage remained, demonstrated by the inability to close the left eye and a hearing loss in the left ear .

The ear has long been seen as important to the regulation of balance, posture, and movement of the entire body. The ear helps to regulate eye movements and spatial awareness. (6) In comparison to the classical sensory integration techniques of Ayres, the Tomatis Method may well prove to be a more efficient and elegant form of sensory integration. In this case study, T.R. demonstrated resoluion of Diplopia. Balance and coordination normalized, and he was able to climb onto and repair the roof of his trailer during his treatment program. T.R. experienced remediation of the acquired deficits in visual tracking and coordination, visual and auditory perception, and reversals in processing.

Additionally, with every problem on the initial problem list, solved, T.R. was able to do some small engine repair on car and boat and home maintenance. He resumed fishing, hunting, and riding in his boat, as well as driving. T.R. was able to read without headaches and to study and pass certification exams in a new occupational field in computer networking.

T.R. became gainfully employed in a different field with a comparable salary within three years of the injury, far surpassing the documented average of seven years post-injury (1). Tomatis' assumption that the brain needs sound energy to enable the thinking process and the development of intelligences (7) is supported by the improvements that T.R. experienced in all aspects of his treatment program. Although one of many modalities implemented, the Tomatis Program appears to have affected change in every domain of need for T.R. and, in this way, served as a definitive integrator in his rehabilitation process.

Note: A summary description of the listening program by phases is available at www.iarctc.org to Registered Certified Tomatis Consultants. The actual program is redundant, extensive and handwritten, and is also available to RCTCs.

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Case Studies of Children with Dyspraxia Following Intervention with a Tomatis Method Program

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ABSTRACT

A report about two cases of children with a diagnosis of a pathology most commonly known as Developmental Dyspraxia are presented, showing changes in speech and other abilities following participation in a Tomatis Method program in Australia. These cases deal specifically with forms of Developmental Dyspraxia called Verbal Dyspraxia. Definitions, main theories, and characteristics of Developmental Dyspraxia inform about what this condition is and how it manifests. Also included is a detailed description of the Tomatis Method program and the physiological and scientific theory basis for observed changes in abilities. Finally, simple conclusions are offered to highlight benefits provided by the Tomatis Method program for those who suffer from Developmental Dyspraxia. (Note: This paper is a summary of a presentation given in May 2003 at the International Tomatis Conference held in Semmering, Austria.)

DYSPRAXIE & MÉTHODE TOMATIS

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Résumé

Cet article cherche à montrer les effets de la Méthode Tomatis sur une pathologie plus connue sous le nom de Dyspraxie. Les études de cas qui seront présentées sont plus spécifiquement des cas de Dyspraxie verbale. L'article inclue des définitions et un profile de la dyspraxie du développement : ce que c'est, comment elle se manifeste, et les caractéristiques associées. Cette étude présente aussi quelques théories à propos des causes de la Dyspraxie et comment la pathologie de la dyspraxie verbale a été adressée en utilisant la Méthode Tomatis. Les études de cas montrent de façon détaillée le cas de deux jeunes enfants atteints de dyspraxie verbale et les progrès qu'ils ont réalisés avec la Méthode Tomatis. Enfin, cette étude offre des conclusions montrant les effets positifs de la Méthode Tomatis avec des personnes souffrant de dyspraxie du Developpement.

Cet article est un résumé de la présentation faite par Françoise Nicoloff en Mai 2003 lors du Congrès International Tomatis à Semmering en Autriche.

WHAT IS DYSPRAXIA?

Developmental Dyspraxia is often known by many different names, including developmental coordination disorder, the hidden handicap, motor learning problems, minimal brain dysfunction, sensory integrative problems, and perceptual-motor dysfunction. Developmental Dyspraxia is thought to be a neurologically based disorder, a motor planning difficulty that is present from birth. It is believed to be an immaturity of the motor cortex part of the brain such that messages are prevented from being properly transmitted to the body. It is thought to affect up to one in twenty children, with boys identified four times more frequently than girls.

The three types of Developmental Dyspraxia are Oral Dyspraxia, Verbal Dyspraxia, and Motor Dyspraxia. Oral Dyspraxia affects children at the level of reproduction of movements of the mouth; children have a hard time making the correct movements with their mouth for the formation of words. Motor Dyspraxia can be seen to inhibit an individual from moving as planned, Motor Dyspraxia also effects the organization of sensory input. Verbal Dyspraxia

causes children to have difficulties making sounds into words. Verbal Dyspraxia is often characterized by an individual's difficulty in producing speech sounds and in sequencing them together into words. Expressive language is usually delayed. Often children with Verbal Dyspraxia are also diagnosed with Oral or Motor Dyspraxia. However, it is important to recognize the distinction between these different terms.

Praxis and Dyspraxia

The term "Dyspraxia" comes from the word "praxis," which means "doing or acting." Praxis itself refers to the generation of volitional movement patterns for the performance of a particular action. It is the ability to select, plan, organize, and initiate the motor pattern that is the foundation of praxis. The term "dyspraxia" is used to describe a dysfunction of this praxis. Dyspraxia then is a disorder of praxis. It is a disorder of the process of ideation (where one forms an idea of using a known movement to achieve a planned purpose). It is a disorder of motor planning (where one plans the action needed to achieve the idea), and it is a disorder of execution (carrying out the planned movement).

Developmental Dyspraxia is often associated with problems of perception, language, and thought and often manifests itself as a difficulty in different areas. Often these difficulties lie in the organization of the speech musculature (tongue, lips, palate, jaw, cheeks, throat muscles), and they affect the voluntary production of sound. Oral dyspraxia is thought to be a disorder of speech articulation, rather than a non-linguistic disorder. As such, the manifestations of the disorder are seen and are involved in speech production, not in the understanding of language nor in the way words are put together into sentences. Even though this is so, the two latter problems can also be present in any dyspraxic case, especially when it comes to sentence production.

Effects of Dyspraxia

Developmental Dyspraxia may affect any or all areas of development - physical, intellectual, emotional, social, language, and sensory - and may impair an individual's normal process of learning. Each individual is affected in different ways and to different degrees. Often Developmental Dyspraxia is inconsistent in that it may affect the individual one day but not the next.

Characteristics Associated with Dyspraxia

Many characteristics are associated with dyspraxia, some of which are listed below:

- Poor balance, posture, and sense of direction.
- Poor fine and gross motor coordination, for example difficulties with throwing and catching a ball or difficulty hopping, skipping, or riding a bike.
- Poor awareness of body position in space.
- Difficulties with vision.
- Use of a lot of mime and gesture to communicate.
- Tactile dysfunction.
- Sensitivity to touch, for example, intolerance of having hair or teeth brushed or nails and hair cut and finding some clothes uncomfortable.
- Difficulty with reading, writing, and speech.
- Confusion about which hand to use.
- Poor social skills.
- Emotional and behavioral problems.
- Slow to learn to dress or feed themselves.
- Phobias or obsessive behavior and impatience.
- Average or above average intelligence with socially acceptable behavior at school but immature behavior at home (frequent tantrums).
- Difficulty understanding logic and reason.

Characteristics Specifically Associated with Dyspraxia on the Level of Speech and Language:

Many speech and language characteristics associated with dyspraxia are listed below:

- Speech problems, including delayed emergence and incoherent production.
- "Groping" or searching for the correct position of the tongue and lips, such that a child's tongue may seem to go everywhere while he/she tries to find the correct position.
- Presence of Oral Dyspraxia, whereby the child cannot imitate oral movements on command, such as poking out one's tongue on demand.
- Using a limited number of sounds.
- Difficulty in producing sequences of sounds.
- Inconsistency of output, for example, on three attempts of the word "dog," the child may say "bog," "gog," and "dod."
- Inability to voluntarily produce an isolated sound or sequence of sounds that have been produced before.

- Discrepancy between sounds used in a spontaneous conversation and those that can be produced in isolation or on request.
- Having no or very few words (up to 100 to 200 words in the child's vocabulary).
- Attempting to make no more than ten two-word combinations.
- Struggling to talk, exhibiting trial and error attempts to say words, accompanied by great frustration.
- Many of these children can understand language at a more advanced level than their limited speech would suggest.

Causes, Theories

Caroline Bowen (Children's Speech Sound Disorders questions and answers, 1998) outlines five main theories that explain the possible basis of Dyspraxia as being due to one of the following:

1. An auditory processing problem.
2. A very specific, specific language impairment affecting language acquisition at the sound-syllable-prosody level.
3. An organizational problem with sequencing the movements required for speech.
4. A difficulty with making volitional movements for speech production.
5. Various combinations of these factors.

Treatment

From our studies and observations it seems that a combination of different therapies works well and benefits the child the most, specifically including the following:

- Tomatis Method program
- Speech therapy
- Occupational therapy for sensory-integration
- Others appropriate for a specific child

CASE STUDIES USING THE TOMATIS METHOD WITH CHILDREN WITH DYSPRAXIA

TIM'S STORY

At age three years, Tim was diagnosed as Dyspraxic with a severe comprehension problem. His speech therapist referred him to the Tomatis Method program. At the age of two and a half years, Tim was unable to say much and was unable to understand simple instructions that his peers could understand. His parents were speaking Hebrew at home. Tim had many tantrums and showed his frustration by relying on non-verbal communication, such as high-pitched screaming. Tim's expressive and receptive skills were delayed at least twelve to eighteen months. At three years, he was not putting more than two words together and did not have consonants at the end of many words.

Tim completed the first thirty hours (over fifteen days) of the Tomatis Method program in January 2001. (Over the next two years he completed a total of 155 hours of this training.)

Within the first ten days, his parents noticed some changes, and by the end of the fifteenth day, these changes were quite dramatic. He began to use much longer and more complex sentences. His vocabulary increased, and he seemed to be aware when he said a word incorrectly. He would attempt to say the word a couple of times until he was able to pronounce it. Tim began to engage in more imaginative play, imitating scenes from children's videos and reproducing a number of phrases using them in the correct context. He had fewer tantrums and very little high-pitched screaming. He used words more when playing with his sister and other children. Overall he seemed less frustrated due to the fact that he was able to express himself more freely. He appeared to be a more assertive and confident little boy.

After the initial 30-hour program, Tim underwent two eight-day continuation programs, each four weeks apart. Changes continued to be noted; however, these were subtler. He tended to ask many more questions, especially to ask permission using the phrase, " Can I?" His level of comprehension improved; he began to cooperate more and began to express his feelings with words instead of tantrums. Socially, he began forming close friendships at kindergarten and communicating well with his peers and teachers. He became better at sharing, asking to have turns, and letting his friends know when he was finished so they could have a turn.

Tim's Story from RCTC View

In the initial consultation, Tim's mother told of a death in her immediate family, which occurred during pregnancy, and also of a long birth process for Tim. Mother reported that Tim also had a few ear infections during his infancy. According to Tomatis, these traumatic experiences can all have an effect on listening development.

Tim's developmental milestones were on time except for language, which had delayed development. From the view of an experienced Certified Tomatis Consultant of 27 years, many children with this developmental history show immaturity in the development of listening skills at the level of auditory processing. Results of Tim's initial assessment indicated that he did not seem to be processing sounds with sufficient clarity and accuracy.

The diagnosis of Dyspraxia was also indicative of immaturity of the vestibular system, a significant part of the inner ear that is responsible for motor control, organization of motor movement, motor planning, sensori-spatial perceptual skills, and balance.

Tim had an immediate response of improvement with the Tomatis Method program. Within four hours of listening, he was able to increase sentence length, a tangible demonstration of the first two laws of the Tomatis Effect observed in the voice of a child. Tim's voice demonstrated increased reception of inclusion of more harmonics perceived by the ear and by the immediate and unconscious inclusion in his voice.

Report from Tim's Mother about His First Term at School

Tim had an amazing start in school. For a child who was initially very adamant about not going to school and had no interest in reading or writing, Tim thoroughly enjoyed going after doing the Tomatis Method program.

Tim settled into his new environment with ease. He tried very hard to be accepted with the boys. He learned approximately 60 sight words and could read 99% of them with no difficulties. He was also able to retrieve more than 20 words from his head and write them down from memory. He even wrote sentences without copying, such as, " I can see my home," or, " I can jump." Tim enjoyed doing homework, and actually reminded his mother to about it. They endeavored to revise his words nearly every day. He happily read from the little reader given to him each week at school. He was also more willing to do extra work from his speech therapist. He appeared more mature and capable of doing more work, demonstrating he simply wanted to learn and was proud of his achievements.

Tim's drawings improved, having more detail, color, and imagination. He wrote and drew at nearly every opportunity, whether at home on paper, on the white board, or on the computer. The writing was clear and legible. He got excited whenever he discovered that he could read words at the supermarket or in a newspaper or a book. He was more confident with his speech and often talked while role playing with toys, and repeated phrases used by his teacher. He did not mind being corrected. His excellent visual memory appeared to help him read. Although his comprehension improved, a prominent delay still existed with his comprehension, and sometimes certain questions needed to be reworded in order for him to understand them.

Report from Speech Therapist

Tim's process of speech development was accelerated after he started the Tomatis Method. He did not need to have instructions repeated as frequently, and was also able to complete activities upon first instruction. Before The Tomatis Method program he could repeat three syllables at a time, while afterward this increased to six. He had longer utterances, and his sentences had more words and better organization.

CHRIS'S STORY

Chris had a normal and uneventful birth, but afterward he required a colostomy, followed by several major surgical procedures. He had pressure equalizing tubes inserted at age three years because several middle ear infections left him with glue ear and a moderate hearing loss. At age two years, Chris was referred to a Speech Pathologist because he was not forming many words and did not seem to understand simple commands.

He was diagnosed with Receptive and Expressive Dyspraxia. Chris's speech pathologist recommended that his parents encourage him to communicate by using some simple sign language. In spite of this assistance, Chris did not progress well with speech and language development. He also had some physical challenges, such as low muscle tone and fine motor difficulties. Chris was left handed, like his mother. He could not put his sandals on, and although he was dressing himself, he was not good at orienting his clothes or shoes. He was also unable to ride a bicycle or catch a ball, activities that require good bilateral coordination.

The speech therapist recommended the Tomatis Method in October 2001, when Chris was almost

four years old, saying she had seen improvement for children with Chris's difficulties when they participated in this program. Chris's mother was an occpational therapist and believed in early intervention, so Chris started the program immediately.

The Mother reported, " After the second day of Tomatis, this child, who had never really said much and never formed a meaningful sentence, asked me clearly in a Delicatessen, 'Mum, are you going to have carrots today? ' I looked down, in such shock, and then he proceeded to tell the shopkeeper that I wouldn't have carrots on my sandwich today. It s hard to explain to a Delicatessen worker why you are crying over your son asking you if you want carrots!"

After a year of Tomatis, eight intensives in all, Chris was transformed into a sociable, confident, talkative boy. He attended the Transition class at Scots College Prep, and the teachers commented on the great improvement they saw during the year.

At almost five years of age, Chris began to take a great interest in books and stories and to try to sound out some words. He also started to take note of his surroundings, remembering landmarks and places from the past such as roads on which he once traveled.

Chris's motor skills also improved, including more coordination in running, climbing, handwriting, and fine motor activities.

As the Tomatis Method program continued, Chris's improvements also continued in many areas. Though further gains became less obvious as he reached age appropriate abilities in some areas, his parents continue to see the benefits of persevering with the program.

It appears that Chris senses the benefit as well! He knows when he needs to listen more and asks his parents when he is going back.

Chris's story from RCTC View

Chris was nearly four years old when seen for initial assessment. He would speak to his mother softly, but did not speak directly to the tester. Occasionally he would use a deaf talk type of voice. He could put only five to six words together and could not say long sentences. Chris had no social communication with his peers at preschool, where he had been badly bullied, kicked, and punched. He tried to express himself, but since his speech was muffled and not well articulated, his peers could not understand him.

On the first day of the Tomatis Method program, it was as if we had found the key to unlocking Chris's world or as Chris's father said, " It has been like someone has lifted a veil from over him." At the end of the first 30 hours, Chris's father reported, " It's a miracle! Chris has started to interact and initiate conversation with other children in the park. He goes to them and says: 'Hello, my name is Chris and what is yours? '" Chris is more assertive with his father. " He shouts at me," says the father; "In the past, he would just start to cringe or to cry."

Chris completed 94 hours of Tomatis Method program over thirteen months. Consultations with Chris's mother were important to help her focus on the positive aspects of her son's progress, which meant a review of her reflection about the way she viewed Chris.

Chris's program was designed according to his parents feedback, his tests, and his speech therapists observations. Working closely with a child's parent and the other professionals with whom he works assists us to establish both a closer relationship to a child and a refined approach to resolving his problems.

Report from Chris's Mother about His First Term at School

Now Chris is able to ride a bicycle. He can swim, snorkel and catch a ball. He is very involved in school activities and his own projects He wants to learn and tell others about his work. He is interested in signs and wants to read and to spell.

The family moved to Queensland last Christmas, where he is settling beautifully into his new environment and new school. His parents report he is very motivated.

His mother recently reported that Chris loves writing. She gave an example of how he constantly asks about and writes down words. One morning he came to the breakfast table with his pen and pad and asked her how to spell " breakfast" and promptly wrote it down. He takes delight in his recent achievements, which is perhaps the single most exciting outcome for his parents when they observe his little face light up when he demonstrates his new abilities! Chris loves maps and uses them to work out where he is going. He enjoys the computer and is quite efficient with standard kin-

dergarten games. He can count to 100. Chris has taken a real interest in reading, having learned quite a few sight words to get him started.

His speech continues to be a little regressed, and he confuses the order of sounds in some words, such as "bremember" for "remember" and "mote troll" for "remote control." He uses "f" sounds instead of "th" and some single words run together.

He still has poor motor control of his mouth; he still dribbles at times and can be unconscious of the way he is eating. Since this control may be a sign of vestibular dysfunction that further Tomatis Method training could address, his parents are considering continuing the program.

Physically he has taken much more interest in playing ball games, bouncing and catching balls and occasionally kicking the ball around. The Tomatis Method program improves the sense of balance and coordination organized through the vestibular system, which, in turn, improves fine and gross motor skills.

Chris is singing all the time! Metaphorically, his parents say that every day their hearts sing when they see or hear Chris conquer something new that gives him so much pleasure. His parents attribute the majority of his improvements to the Tomatis Method program; his mother recalls the significant moment when her view changed of Chris's potential. " I always remember back to that first day after Tomatis when that little boy who hardly strung two words together asked me if I wanted carrots on my salad sandwich... it all took off from that moment!"

Report from the Speech Therapist

Before the Tomatis Method program, voice production was impossible for Chris. After completing a number of intensives, he started getting into the nuance of the voice sounds, for example: coming (sounding) from the front of the mouth instead of at the back (sounds from the front and from the back require quite different mouth movements). Chris made a fantastic effort on his part, getting into the nuance of making the different sounds despite it being a difficult task and not easily achieved. A dramatic change in his confidence level has followed speech his improvement.

BENEFITS OF THE TOMATIS METHOD

These case studies show some benefits of using the Tomatis Method program with individuals with dyspraxia. For example:

- In general, words are more clearly spoken.
- Speech errors affecting vowels as well as consonants decrease. For instance, 'milk' might be pronounced 'mih', 'muh' or 'meh .'
- The Tomatis Method program fine-tunes coordination of the different components of the mouth for production of appropriate sounds.
- The Tomatis Method program improves comprehension.
- The Tomatis Method program improves organization of the speech musculature to bring more control to the voluntary production of sound.
- Social, emotional, physical, and behavior modifications occur.
- The Tomatis Method program reduces anxiety in any communication task and increases the child's confidence by being able to say what he or she wants and needs.
- The Tomatis Method program modifies the organization of a child's responses in communication.
- In all cases observed at the EARobic Centre in Sydney, within a few days of intensive ear stimulation with the Electronic Ear, the child's language improves dramatically.
- The Tomatis Method program appears to modify behavior by making it easier to communicate, to interrelate and to develop potential.

CONCLUSION

The Tomatis Method program improves the part of Dyspraxia associated with Motor Planning Disorder, bringing more ability to appropriate use, control, and coordination of the tongue and mouth muscles for production of specific sounds, including speech. It appears that use of the Tomatis Method assists children to move their tongues more quickly and easily to the correct position to form words so that word production attempts are more successful. Placement of the sound in the mouth is more precise with improved muscle control.

The Tomatis Method program increases the ability of a child to understand instructions and respond to teaching. The integration of grammatical structure proceeds much faster as sound stimulation creates new brain pathways for speech

comprehension and production. One's ability to process auditory stimulation is changed as a result of new neural connections. The Tomatis Method program stimulates the nervous system to re-pattern when a pattern was not previously formed properly or lost through accident, illness, or trauma.

At the level of perception, which is often referred to as a more receptive process, children doing the Tomatis Method program start to more accurately perceive sounds within three weeks, compared to those participating only in traditional speech therapy whose response improvement is typically after six weeks. "The beauty of The Tomatis Method program for children with Dyspraxia, " says Esther Bruhl, Speech Therapist, " is that children can improve quickly without the need to struggle to achieve the right sounds. " This improvement also makes the process less repetitive for the speech therapist, and therefore less frustrating for both therapist and child.

The Tomatis Method program also affects emotional and behavioral responses to life. Not only does it improve listening but by improving these skills and the organization of a child's responses in communication, it also decreases their frustration, resulting in fewer tantrums and other disruptive behavior.

By the end of Tim's Tomatis Method program, his attempts at producing sounds and words resulted in less physical and emotional frustration. As his control of fine and gross motor skills improved, his physical abilities and confidence using them were enhanced.

Our association with outside professionals such as speech language therapists and occupational therapists has shown them how the Tomatis Method program facilitates and speeds up their own work. It has also produced some much-needed and positive collaboration for the best outcome for the child and parents.

Note: Tomatis Method program descriptions for these cases are available online to Registered Certified Tomatis Consultants.

Tomatis-Assisted Speech Therapy

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KEY WORDS: Tomatis, Tomatis Method, Speech Therapy, Augmented Speech Therapy, Speech-Language Therapy, Autism, Auditory Processing Disorder, APD, Attention Deficit Hyperactivity Disorder, ADHD, Oral Motor Therapy.

ABSTRACT

OBJECTIVE: Since Tomatis Listening Training is said to activate the auditory and attention circuits of the brain, we wanted to see if there was a synergistic benefit from combining it simultaneously with speech therapy. METHODS: In the first case, a fourteen-year-old girl with Autism and no speech despite eight previous courses of speech therapy, received 30 hours of Tomatis Listening Training, followed by ten months of three weekly one-hour sessions of simultaneous speech therapy and Tomatis Listening Training. In the second case, a nine-year-old boy with Attention Deficit Hyperactivity Disorder, Auditory Processing Disorder, poor school performance, and secondary impaired phonemic awareness, received simultaneous speech therapy and Tomatis Listening Training. RESULTS: The girl in case one now has functional use of 34 words and 17 sounds and has had many social improvements. The boy in case two went from a phonemic awareness rating level of mid second grade to a rating of beginning fifth grade in a period of four months, which is faster than usual.

SPRACHTERAPIE MIT TOMATIS-UNTERSTÜTZUNG (VON JOHN TATUM)

ZIELE: Da ein Tomatis-Hörtraining die für die Gehörwahrnehmung und Aufmerksamkeit relevanten Bereiche des Gehirn aktivieren soll, wollten wir herausfinden, ob es einen Synergetischen Nutzen gibt, es mit einer gleichzeitigen Sprachtherapie zu kombinieren. METHODEN: Im ersten Fall erhielt ein vierzehnjähriges autistisches Mädchen ohne Sprachfähigkeit trotz acht vorheriger Sprachtherapie-Anwendungen ein Tomatis-Hörtraining von 30 Stunden, gefolgt von dreiwöchigen Sitzungen mit gleichzeitiger Sprachtherapie und Tomatis-Training über einen Zeitraum von zehn Monaten. Im zweiten Fall wurde ein neunjähriger Knabe mit Aufmerksamkeits-Defizit-Hyperaktivitäts-Syndrom, Hörverarbeitungsstörungen, schlechten Schulleistungen und sekundär verminderter Phonembewusstsein einer gleichzeitigen Sprach- und Tomatis-Therapie unterzogen. ERGEBNISSE: Das Mädchen in Fall eins besitzt nun einen funktionalen Wortumfang von 34 Worten und 17 Lauten und konnte sich sozial stark verbessern. Der Knabe von Fall zwei entwickelte sich von einer Bewertung des Phonembewusstseins in der mittleren zweiten Stufe zum Beginn der fünften Stufe innerhalb von 4 Monaten, eine schnellere Entwicklung als üblich.

RÉSUMÉ

Tomatis et Orthophonie

Etant donné que l'on dit que la rééducation de l'écoute Tomatis stimule les circuits nerveux de l'audition et de l'attention, nous avons voulu savoir s'il y avait un avantage synergique à combiner simultanément la Méthode Tomatis avec l'orthophonie.

LES MÉTHODES : Le premier cas est celui d'une jeune fille de quatorze ans autiste présentant une absence totale de langage en dépit d'une rééduca-

tion orthophonique de huit séances et de 30 heures de rééducation Tomatis de l'écoute, suivies ensuite pendant dix mois à raison de trois fois par semaine en même temps d'une heure de séance d'orthophonie et de séances Tomatis. Le deuxième cas est un garçon de neuf ans présentant un trouble de déficit de l'attention avec hyperactivité, un trouble auditif d'intégration sensorielle, de pauvres résultats scolaires, et un trouble secondaire de la conscience phonémique, qui a bénéficié en même temps de séances d'orthophonie et de séances de rééducation Tomatis de l'écoute.

LES RÉSULTATS : La jeune fille du premier cas a maintenant l'utilisation fonctionnelle de 34 mots et de 17 sons et montre beaucoup d'améliorations sur le plan social. Le garçon du deuxième cas est passé en quatre mois d'un niveau de deuxième année du primaire au niveau de cinquième année du primaire en ce qui concerne la conscience phonémique. Ce délai de quatre mois montre que la combinaison de ces deux formes de thérapie opère de façon plus rapide que d'habitude.

TERAPIA DE LENGUAJE APOYADA CON EL METODO TOMATIS

OBJETIVO: Ya que se dice que el Metodo Tomatis de Entrenamiento Auditivo activa los circuitos cerebrales auditivos y de atencion, queriamos ver si habia un beneficio sinergetico combinandolo simultaneamente con terapia de lenguaje. METODOS: En el primer caso, una nina autista de catorce anos y sin lenguaje a pesar de 8 cursos previos de terapia de lenguaje, recibio 30 hrs de Entrenamiento Auditivo Tomatis seguido por diez meses de tres sesiones semanales de una hora de terapia de lenguaje y metodo Tomatis. En el segundo caso, un nino de 9 anos con Deficit de Atencion e Hiperactividad y con Desorden de Procesamiento Auditivo, pobre rendimiento escolar y secundariamente, conciencia fonemica debilitada, recibio en forma simultanea terapia de lenguaje y Entrenamiento Auditivo Tomatis. RESULTADOS: La nina en el primer caso tiene ahora uso funcional de 34 palabras y 17 sonidos asi como mejorias varias a nivel social. El nino del segundo caso,paso de un nivel de segundo grado en conciencia fonemica a un nivel de quinto grado en 4 meses, lo cual es mas rapido de lo normal.

INTRODUCTION

During JT's Tomatis Professional Training experience with Dr. Billie Thompson, RCTC, he observed an Initial Assessment with a three-year-old boy with Autism. The child was verbally and physically "stimming" (i.e. repetitive actions to stimulate the brain) and oblivious to those around him. When taken to a room with some toys, he did not play appropriately, but rather used the toys for "stimming" and, in a forceful way, still ignored others. Dr. Thompson had the mother hold the boy in her lap, with his back to her and her arms around him so he could not remove the headphones. He protested only a few minutes and then became calm and cooperative. He was then placed on the floor with a wooden train set and began playing appropriately with this toy. With this remarkable and almost immediate transformation, it was now clear that it was possible to train and teach this attentive brain. His mother seemed relieved and pleased that he could keep the headphones on for the entire two-hour daily listening session. She began to change her expectation of what her child could accomplish.

BACKGROUND

The background of Tomatis Listening Training is relevant to this work. Alfred Tomatis, M.D. was an Ear, Nose, and Throat specialist in Paris, France. He was the son of an opera singer, and some of his first patients were opera singers who could no longer sing certain notes they once had produced. After examining and treating their vocal cords did not help, he thought to do a hearing test. He was surprised to find that their audiogram looked similar to those of ammunition factory workers who had hearing loss from exposure to loud sound. He also noticed that the frequency the singers could not sing was the same frequency they were having trouble hearing. He concluded that the voice only contains what the ear hears. Dr. Tomatis was able to prove this by having subjects produce a vowel sound while simultaneously listening to themselves with the sound filtered in various ways. He observed that the vocal production changed immediately and unconsciously according to the filtering. He realized at that time that the ear controls the voice, and concluded he only had to train the ear to restore the voice. In time, he also discovered that he also needed to include microphone work to listen to one's own voice heard with a good quality through

the Electronic Ear he developed. The device allows the music of Mozart and other sounds to be supplied through air and bone conduction, with a patented delay between their processing. The sounds can be filtered, and multiple adjustments individualize the listening experience based on assessment of listening and of client response (Tomatis, 1991).

The ear is involved in speech because those who cannot hear can only speak with a great deal of speech therapy, and even then, their speech does not sound completely normal. This relationship between ear and voice is illustrated by an observation that when songbirds are incubated by birds that do not sing, the hatchlings do not sing. (Negas, no date, in Tomatis, 1996). If we want our clients to "sing," why not let Mozart sing to them through the Tomatis equipment?

With his early research with singers, Dr. Tomatis clarified the relationship between the ear and speech. He formulated three laws, known as the Tomatis Effect with its two corollaries. These scientific principles were confirmed independently of Tomatis at the Sorbonne by and presented to the French Academy of Medicine and the French Academy of Science.

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.

Besides speech, the ear is also involved in attention. Some of those early opera singers reported improvements in energy level, thinking and attention in addition to their voice changes. Some singers had children with similar problems and asked Dr. Tomatis to work with them, too. This began a process of discovery of many and varied applications for the Tomatis Method, for children as well as adults, opening insight into problems with school learning related to listening disabilities. Problems with attention continue to bring people to consider Tomatis Listening Training. Indeed, the three-year-old boy with autism noted above exhibited an immediate improvement in attention with the Tomatis headphones on.

Tomatis worked with many celebrities who give him credit for assisting their success and brought attention to his research and method. Gerard Depardieu, celebrated French actor who has American films to his credit since learning English through the Tomatis program, describes his early experience with the program. Depardieu was nineteen years old when he started and had significant emotional, hearing, and speech problems. He credits Dr. Tomatis with helping him overcome his difficulties and freeing his mind to think. "Before Tomatis, I could not complete any of my sentences. He helped give continuity to my thoughts, and he gave me the power to synthesize and understand what I was thinking" (Chutkow, 1994).

The authors at Optimal Health & Learning Center and the members of International Association of Registered and Certified Tomatis Consultants (IARCTC) are committed to increasing research about the Tomatis Method and sharing findings with others. Since Tomatis Listening Training activates the auditory and attention circuits, and since the aforementioned child was immediately able to focus and stop "stimming" with the Tomatis headphones, it seemed logical to see if combining Tomatis Listening Training with speech therapy would have a synergistic benefit.

MATERIALS, METHODS, AND RESULTS

Case One

A fourteen-year-old female with a diagnosis of Autism was referred for Tomatis Listening Training, having completed her first intensive with Dr. Thompson and then continuing with our center when it opened. The girl did not verbally communicate other than to make grunting sounds to punctuate her gestures. She interacted little with others and was impatient to go home. She was under the care of and referred by Jeffrey Bradstreet, MD, an international leader in the latest treatments for Autism Spectrum Disorder. She had completed eight different extensive courses of speech therapy, including oral motor therapy, since the age of four years. Despite these treatments, when she presented to us, she could only make the three sounds of "Ba", "Da", and "Ma."

At the commencement of treatment, the parents completed the Abilities-To-Be-Improved Form, in which they noted their priorities for changes for

their child. Then each day they were asked to complete a Daily Observation Form, which assisted our staff to monitor changes at home to accompany their own observations of the child in the center. After the first intensive of 30 hours of Tomatis Listening Training without integrated speech therapy, the parents reported increases in awareness of auditory input, independence, motivation, and desire to communicate as noted on the interim Abilities-Improved Form. She was reported to be more receptive to language input and more willing to try new experiences. She was calmer, more tolerant, less irritable, sleeping better, and no longer overly sensitive to sound. Additionally, her parents also reported that she tried to verbalize more and to sing.

Because the girl appeared receptive to practicing speech sounds we proposed and the parents agreed to a program integrating simultaneous Tomatis Listening Training with the Lindamood® Phoneme Sequencing Program, (LiPS) (Lindamood, 1998). At this time the child began listening to more filtered Mozart music to focus her to the English language range of sounds. The LiPS program is a structured method of teaching awareness and production of basic sounds or phonemes. Caroline McCauley, RCTC with six years experience administering the LiPS Program, administered this part of the program. She provided approximately 30 minutes of active Tomatis microphone work with the LiPS content followed by 30 minutes of passive Tomatis Listening Training for three weekly sessions over ten months, (a total of approximately 120 hours). The girl's parents reported that she was "really trying to talk," attempting to ask questions, understanding others' conversations, using non-prompted words, exhibiting less frustration when moving from one task to another, and becoming more interactive with peers. Where she used to obsessively watch only videotaped Disney movies, she began to watch regular television. She appeared to enjoy sitting down and practicing her words at home. When periodically asked if she wanted to stop the speech and listening sessions, she now said she wanted to continue.

Other changes in daily living skills were noted. After nine months of work with us, she went for her regular dental exam. Until that time, for the first 15 years of her life, she had to be held down by a dental assistant on each extremity and by her father holding her head so that the dentist could pry her mouth open with an instrument and work on her teeth. Because her father noticed many global positive changes since starting Tomatis, he asked her to cooperate now, and she did! Her father reported that when she sat in the chair, opened her mouth, and followed the dentist's instructions, the dentist was amazed and touched by the transformation.

At this point, JO continued treatment of the child using Beckman Oral Motor Therapy (Beckman, 2000) and traditional speech therapy for sound production, for a total of five months. She did 30 minutes of active Tomatis Listening Training with speech therapy content and 30 minutes of passive Tomatis Listening Training.

To date, this client has mastered the following speech sounds in isolation: /p, b, t, d, f, v, th, s, m, n, w, wh, ee, a, o, oe, oo/. She is currently working on mastering the following speech sounds in isolation: /k, g, <u>th</u> (voiced), z, sh, ch, l, r, i/. She can now say functional words such as "sorry", "meat", "teeth", "tooth", "sad", "happy", her name, "meet", 'Bye", "man, "mom", "map", "feet", "me", "toss", "food", "off", "on", and can identify the use of them in sentences. She is working on mastering the production of words such as "Hi", "dad", "bat", "ball", "fish", "please", "sheep", "hot dog", "bun", "toes", "cheese", "ham", "bean", "moon", and "peas". Considering she had little to no speech prior to starting Tomatis Listening Training and then continuing with combined active Tomatis work with speech therapy exercises, the girl has experienced significant improvement in communication, attention, comprehension, socialization, daily living skills, and learning in general. This case also demonstrates that older children as well as younger children can gain from this program because much of the stimulation to the brain comes through the ear.

Oral motor therapy, a treatment used to strengthen the oro-facial muscles necessary for eating and speech, was a focus in many of this client's speech therapy sessions. The initial Beckman Oral Motor Assessment found these results: decreased range of movement for the jaw, 0% posterior cheek strength bilaterally, 0% jaw strength bilaterally, 0% tongue movement toward gum massage, 33% lateral tongue movement to lower gum and cheeks bilaterally, 0% lateral tongue movement to the left upper gum, 33% lateral tongue movement to the right upper gum, 0% tongue tip elevation, and 0% tongue midblade elevation. For three months, she has been

receiving Beckman Oral Motor therapy, (Beckman, 2000 and personal training and consultation) including Beckman deep tissue release (Beckman, 2002), with simultaneous Tomatis Listening Training three times a week. Currently, her only weaknesses are with her tongue midblade elevation (67%) and tongue tip elevation (33%). She has made great gains and continues to improve with more oral motor sessions. Having the ability to move the structures necessary for speech makes the production of specific speech sounds much easier. The combination of Tomatis Listening Training, speech therapy, oral motor work, and her motivation and diligent practice of her newly learned sounds and words have made a dramatic impact on her overall speech.

CASE TWO: A nine-year-old boy in fourth grade was referred because of significant difficult in spelling, writing, and penmanship, despite obvious normal or higher intelligence. He had previously been diagnosed with Attention Deficit Hyperactivity Disorder (ADHD), yet prior attempts at neurofeedback and medication elsewhere had not significantly improved his school performance. In addition to psychiatric history and examination, we administered the Test of Variables of Attention (TOVA), a computerized and standardized test for attention and ADHD. We ordered psycho-educational testing by an outside psychologist and audiology evaluation by an audiologist specializing in Auditory Processing Disorder. These evaluations confirmed the diagnosis of ADHD and Auditory Processing Disorder (APD). Our staff also administered the Lindamood® Auditory Conceptualization Test (LAC), and assessed his overall language skills. He was administered the Clinical Evaluation of Language Fundamentals, Fourth Edition (CELF-4) (Semel, Wiig, & Secord), Test of Auditory Reasoning and Processing Skills (TARPS) (Gardner, 1992), and the Test of Auditory-Perceptual Skills - Revised (TAPS-R) (Gardner, 1996). His overall performance on the CELF-4 was in the borderline range of functioning, with language memory being his area of most difficulty. His auditory perceptual skills were above average for his grade level, although areas of difficulty included auditory memory for numbers (forward and backward), auditory word memory, and auditory word discrimination. Because of his APD, he had poor phonemic/phonological awareness. On the LAC test, he scored in the middle of second grade (Converted Score of 62) in his ability to discriminate one phoneme from another and to segment a spoken word into its constituent phonemic units. These skills are necessary for reading and spelling competence.

Following a thorough consultation with his parents regarding the findings and training and treatment options, they approved the recommended plan. He continued medication he was on for ADHD (Strattera-atomoxetine HCL) and started the Tomatis Listening Training. On the second day of Tomatis Listening Training, he began work with the Lindamood® Phoneme Sequencing Program (LiPS), during an active Tomatis Listening Training session. While both the LiPS program and Tomatis Listening Training stand individually in success, combining them proved to be of additional help for this client, as shown by re-administration of the LAC. After 60 sessions (60 hours) following approximately four months training, the boy received a Converted Score of 87, placing him above his grade level at the beginning of fifth grade in his phonemic/phonological awareness skills. In addition to the scores, he has frequently made comments regarding his own perception of easier reading, spelling, and comprehension in school activities. These kinds of gains usually take twice as long (115-120 hours of intensive treatment). Therefore combining Tomatis with the LiPS program resulted in a significant savings of time and money.

DISCUSSION

In case one, a girl with Autism, who could not speak despite repeated trials of speech therapy, has begun to speak. In case two, a boy with attention and auditory processing difficulties, who performed significantly below grade level, alleviated the need to wear headphones in the classroom and improved his overall school performance. He now scores above grade level in his phonemic awareness, with resulting improvements in his previously weak area of language arts. Tomatis' scientific discovery that the ear controls speech, described as The Tomatis Effect (above), explains theoretically and physiologically why training the ear can improve speech.

These cases illustrate the synergistic benefit of combining Tomatis Listening Training with speech therapy, providing the added benefit to these children of increased performance with reduced time and money.

The authors also note they routinely combine Tomatis Listening Training with Nanci Bell's ® Visualizing and Verbalizing for Language Comprehension and Thinking program, (V/V™), with a similar augmenting effect. If visualization and language comprehension is weak, 30 hours of passive Tomatis Listening Training is followed by using V/V™ during active Tomatis sessions. Then LiPS will be used with active Tomatis sessions for auditory processing, reading, and spelling problems. The usual Tomatis protocol of two hours of Tomatis Listening per day for 30 hours is continued, followed by a four-week break, and then another 30-hour intensive of Tomatis. During one of the two Tomatis hours, they do LiPS or V/V™ protocols for active voice Tomatis Listening Training sessions. During the four-weeks following completion of the intensives, rather than taking a complete break, from one to three hours of active Tomatis Listening Training using LiPS, V/V™, or speech therapy is continued each week. If a child's problems are more serious, 30 to 60 hours of Tomatis will be implemented before adding the other programs in order to provide the foundational ability to listen upon which all language is built. The recommended protocol to provide the best outcome takes into consideration goals for the child, their starting abilities, and money and time resources available to the family.

Other professionals are invited to review these cases and explore adding Tomatis Listening Training to their services, including those for Sensory Integration Disorder and other types of presenting problems that involve the analysis of sound and of movement by the ear. By combining Tomatis Listening Training with speech therapy, greater than normal gains are achieved, results occur more quickly, and new capabilities emerge for the child.

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Tribute from Members of IARCTC to Dr. Alfred A. Tomatis (1920 – 2001)

Billie M. Thompson, Ph.D., RCTC,
Chair of IARCTC

DR. ALFRED A. TOMATIS (1920 – 2001) spent the last half of the twentieth century developing a method of sound stimulation and consultation that carries his name. He was a French ear-nose-throat specialist, philosopher, author, psychologist, educator, and inventor well known worldwide for a wide variety of applications with which his method worked. As an entrepreneur, he created the Electronic Ear, a machine that held various patents in many countries and that is the cornerstone to his method.

Dr. Tomatis garnered both controversy and praise, the former because he questioned and sometimes challenged established beliefs and the latter because his method facilitated desired changes in people's lives. He invited us to think differently about human potential and how listening is the most basic skill for communication and learning. The word "person" originates from "per" and "son" (sound), and each of us is represented by how we listen to and speak with sound.

Our ears also organize our movement in three-dimensional space, and we must listen to our bodies to move well.

Tomatis developed a Listening Test to chart a person's listening strengths and weaknesses to provide helpful information when developing Tomatis Method programs. They allow those trained to use the Method to observe changes that occur during and following participation in these programs. Both the Method and the Listening Test can be subjects of research published in this journal.

The contributions of Dr. Tomatis began in the 1950s when he discovered a scientific principal, known now as the Tomatis Effect. He observed that a group of opera singers with whom he worked could no longer produce the sounds they needed with their voices and they required a solution because their jobs were in jeopardy. His discovery came after traditional medical treatments failed to improve their voices, and he began to research by asking, "What else can I do?" His thoughts turned to the audiometer he used to test hearing loss of thousands of ammunition factory workers, and he decided to test the singers' hearing. This was a serendipitous choice, as it turns out, because the source of the voice problems was not with the larynx but rather with the ear. As he reviewed results of the singers' hearing tests, he noticed how similar they were to the tests of the factory workers, and Dr. Tomatis made an astounding discovery. The missing sounds from each person's voice were the identical sounds missing from that person's ears.

Dr. Tomatis asked another question based on his observation. "Could the voice only produce the harmonics contained in the ear?" He was engaged in the research process known as grounded theory (Glasser & Strauss, 1966), in which one begins by asking questions, then gathers qualitative and quantitative data and refines questions, and then evolves theory. This process is visible from the fifteen books Tomatis wrote, the many

articles and conference presentations, and the proprietary protocols developed working with thousands of clients. This specific question evolved into theory known as the Tomatis Effect, with two corollaries added as the Electronic Ear took form and was used with the singers. The Tomatis Effect is the basis for the Tomatis Method.

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.

The Tomatis Effect was scientifically verified independently of Dr. Tomatis at the Sorbonne University in 1957. Following use of Tomatis Method with singers, others asked another question of whether it could help them with improvements in other communications areas. The answer "We can try" resulted in more observations and more questions that continue into the future about applications for which it could be used. Listening became distinguished from hearing and acknowledged for the major role it plays in our communication and learning processes. Even before birth we are listening and influencing the development of the fetal brain, since the only sensory system fully developed before birth, showing up four and a half months into the process, is the ear. It appears that our ears are necessary for the brain's proper development. Over eighty percent of the pathways in the brain connect to the auditory or vestibular systems. Tomatis first proposed this role of the fetal ear and considered this information when developing Tomatis Method programs.

Dr. Alfred A. Tomatis left a legacy of the Tomatis Method and began what Dr. Susan Andrews and I describe as "The Emerging Field of Sound Training" (IEEE Engineering in Medicine and Biology, Feb/Mar 1999). Members of the IARCTC pay tribute to Dr. Tomatis by carrying this work forward and promoting funding and publication of Tomatis Method research. This task is essential for broad acceptance worldwide from the scientific community and from those who determine its inclusion in programs in society for people of all ages. The lifelong work of Dr. Tomatis supports people to listen to themselves, others, and the environment. Good listeners can receive information from others and also express their own views toward creating a safe and sound world in which to live.

HOMMAGE DES MEMBRES D'IARCTC À DR. ALFRED A. TOMATIS (1920 - 2001)

Billie M. Thompson, Ph.D., RCTC, Présidente d'IARCTC

LE DR. ALFRED A. TOMATIS A passé la dernière moitié du vingtième siècle à développer une méthode de stimulation par le son et de consultation qui porte son nom. C était un spécialiste en oto-rhino-laryngologie, un philosophe, un auteur, un psychologue, un éducateur, et un inventeur français bien connu dans le monde entier pour une grande variété d'applications avec lesquelles sa méthode a fonctionné. En tant qu'entrepreneur, il a créé l'oreille électronique, une machine qui détient divers brevets dans de nombreux pays et qui est la pierre angulaire de sa méthode.

Le Dr. Tomatis a suscité à la fois polémique et éloge, la première parce qu'il a interrogé et a parfois défié la croyance établie et le dernier parce que sa méthode facilite les changements désirés dans la vie des gens. Il nous a invités à penser différemment au potentiel humain et à voir comment l'écoute est la compétence la plus fondamentale pour la communication et l'étude. Le mot personne provient de « per » et « son » et chacun de nous est représenté par la façon dont nous écoutons et parlons en utilisant le son. Nos oreilles organisent également notre mouvement dans l'espace tridimensionnel, et nous devons écouter nos corps pour bien nous mouvoir. Tomatis a développé le test d'écoute pour dresser une carte des points forts et faibles de l'écoute de la personne afin de fournir des informations utiles pour le développement des programmes réalisés avec la méthode de Tomatis. Pour ceux qualifiés comme praticiens de la méthode, Ils permettent d'observer les changements qui surviennent pendant et après la participation à ces programmes. La méthode et le test d'écoute peuvent être des sujets de recherche publiés dans ce journal.

Les contributions du Dr. Tomatis ont commencé dans les années 50 quand il a découvert un principe scientifique, connu maintenant comme « l'effet Tomatis ». Il a observé qu'un groupe de chanteurs d'opéra avec qui il a travaillé ne pouvait plus produire les sons qu'ils avaient besoin d'émettre avec leurs voix et ils chercher une solution pour éviter de mettre leur carrière en péril. Sa découverte est survenue après que les traitements médicaux traditionnels aient été sans effet sur leurs voix, et il a commencé à chercher en se posant la question « Qu'est ce que je peux faire d'autre ? » Ses pensées se sont tournées vers le test auditif qu'il avait l'habitude d'utiliser pour examiner la perte d'audition de milliers d'ouvriers d'usine souffrant de surdité. Il a donc décidé d'examiner l'audition des chanteurs. Il s'avère que ce fut un choix judicieux, parce que la source des problèmes de voix des chanteurs était non avec le larynx mais plutôt avec l'oreille. Alors qu'il passait en revue les résultats des tests auditifs des chanteurs, il a noté à quel point ils étaient semblables aux tests des ouvriers d'usine. Le Dr. Tomatis a fait ainsi une découverte étonnante. Les sons absents de la voix des chanteurs étaient les mêmes sons qui manquaient dans les oreilles des ouvriers travaillant dans le bruit. Suite à ses observations, le Dr. Tomatis s'est posé une autre question. Est-ce que seule la voix peut reproduire les harmoniques contenues dans l'oreille ? Il s'est engagé dans un procédé de recherches connu sous le nom de théorie de base (Glasser et Strauss, 1966), dans lequel on commence en posant des questions, puis on recueille des données qualitatives et quantitatives et on raffine les questions, et puis la théorie évolue. Ce processus est évident dans les quinze livres que Tomatis a écrits, les nombreux articles et présentations lors de conférences, et le fonctionnement développé par les protocoles de propriété industrielle avec des milliers de clients. Cette question spécifique s'est transformée en une théorie connue sous le nom d'effet de Tomatis, avec deux corollaires supplémentaires, l'oreille électronique qui a evolué et a été utilisée avec les chanteurs. L'effet Tomatis sert de base à la méthode Tomatis. Loi 1 : La voix ne contient que les harmoniques que l'oreille peut entendre. Loi 2 : Si vous donnez la possibilité à l'oreille d'entendre correctement les fréquences distordues ou les sons qui ne sont pas entendus correctement, ceux-ci sont immédiatement et inconsciemment reproduits dans la voix.

Loi 3 : En imposant pendant un certain temps une certaine audition, on modifie de manière permanente l'audition et la phonation.

L'effet Tomatis a été scientifiquement prouvé indépendamment du Dr. Tomatis à l'université de la Sorbonne en 1957 à Paris. Après l'utilisation de la méthode Tomatis avec les chanteurs, cela a fait émerger d'autres questions à savoir si elle pouvait aider dans d'autres secteurs de communication. La réponse fut « On peut essayer » et eut comme conséquence plus d'observations et encore plus de questions qui ont continué à évoluer avec les applications pour lesquelles la Méthode Tomatis peut être employée. Tomatis a ainsi distingué l'écoute de l'audition et a reconnu l'oreille dans le rôle principal qu'elle joue dans notre communication et nos apprentissages. Même avant la naissance nous écoutons déjà et cela influence le développement du cerveau foetal, puisque le seul système sensoriel à s'être entièrement développé avant la naissance, et cela des quatre mois et demi de la grossesse, est l'oreille. Il s'avère que nos oreilles sont nécessaires pour le développement approprié du cerveau. Plus de quatre-vingts pour cent des voies dans le cerveau sont reliées aux systèmes auditifs ou vestibulaires. Tomatis est le premier à avoir proposé ce rôle de l'oreille foetale et a pris en compte cette information pour développer les programmes utilisés dans l'application de méthode de Tomatis.

Le Dr. Alfred A. Tomatis a laissé pour héritage la méthode de Tomatis et a commencé ce que le Dr. Susan Andrews et moi décrivons comme «le champ émergeant de l'utilisation du son dans la rééducation » (IEEE Engineering in Médecine et Biologie, Fév./Mars 1999). Les membres de l'IARCTC rendent hommage au Dr. Tomatis en poursuivant ce travail et en contribuant au financement et à la publication de la recherche sur la méthode de Tomatis. Cette tâche est essentielle pour remporter dans le monde entier l'adhésion à la Méthode Tomatis par la communauté scientifique et par ceux qui déterminent son introduction dans les programmes pour les personnes de tous les âges de la société. Tout au long de sa vie, le Dr. Tomatis a oeuvré pour permettre aux personnes de

s'écouter et d'être à l'écoute des autres et de leur environnement. Les bons écoutants reçoivent leur information des autres et peuvent également exprimer leurs propres opinions pour créer un monde sonore sûr dans lequel vivre.

IN WÜRDIGUNG VON DR. ALFRED A. TOMATIS (1920 - 2001)

Dr. Billie M. Thompson, Ph.D., RCTC, Vorsitzende der IARCTC

DR. ALFRED A. TOMATIS entwickelte in der letzten Hälfte des 20. Jahrhunderts eine Methode der Klangstimulation, die seinen Namen trägt. Als ein französischer Hals-Nasen-Ohren-Spezialist, Philosoph, Autor, Psychologe und Erfinder war er weltweit bekannt für die Vielfalt an Anwendungen seiner Methode. Er entwickelte ein patentiertes Gerät, genannt Elektronisches Ohr, das einen Eckpunkt der Methode darstellt.

Dr. Tomatis erntete sowohl Widerspruch als auch Verehrung, ersteres, weil er etablierte Ansichten hinterfragte und ihnen manchmal auch widersprach, letzteres, weil seine Methode viele ersehnte Lebensveränderungen erleichterte. Er lud zum Nachdenken über das menschliche Potential und über das Zuhören als grundlegendste Voraussetzung für Kommunikation und Lernen ein. Das Wort „Person" stammt von „per" (für) und „son" (Klang) ab und jeder Mensch wird dadurch charakterisiert, wie er dem Klang zuhören und in der Sprache wiedergeben kann. Unsere Ohren beeinflussen maßgeblich unsere Bewegung im dreidimensionalen Raum und wir auch unserem Körper zuhören, um uns gut bewegen zu können. Tomatis entwickelte einen Hörtest zur Feststellung der Stärken und Schwächen der Hörfähigkeit, um wichtige Informationen für die Entwicklung der Tomatis-Programme zu erhalten. Damit können die in der Methode ausgebildeten Personen die während oder nach einem Hörtraining auftretenden Veränderungen feststellen. Sowohl die Methode als auch der Hörtest sind Gegenstand der in diesem Journal veröffentlichen Forschungen.

Die ersten wissenschaftlichen Erkenntnisse sammelte Dr. Tomatis in den 50er-Jahren, als er das wissenschaftliche Prinzip erforschte, das als der „Tomatis-Effekt" bekannt werden sollte. Er stelle fest, dass einige Opernsänger, die er behandelte, manche für ihre Stimme wichtigen Klänge nicht mehr hervorbringen konnten. Weil damit ihr Beruf in Gefahr war, suchte er nach Lösungen. Da die traditionellen medizinischen Methoden keinen Erfolg bei der Verbesserung der Stimme zeigten, frage er sich: „Was sonst kann ich noch versuchen?" Seine Gedanken wanderten zu den Audiometern, mit denen er üblicherweise die Gehörverluste von Fabrikarbeitern testete, und er entschied sich, auch das Gehör der Sänger zu testen. Dies war, wie sich herausstellte, eine richtige Wahl, denn die Stimmprobleme lagen nicht an den Stimmbändern sondern an den Ohren. Als er die Hörtestergebnisse betrachtete, stellte er viele Ähnlichkeiten mit den Tests der Fabrikarbeiter fest und Dr. Tomatis machte einer erstaunliche Entdeckung. Die in der Stimme fehlenden Klänge waren ident mit den vom Ohr nicht wahrgenommenen Frequenzen.

Aufgrund dieser Entdeckung stellte sich Dr. Tomatis eine andere Frage. „Kann die Stimme nur Frequenzen produzieren, die auch das Ohr wahrnimmt?" Er ging nach einem Forschungsprinzip genannt „begründete Theorie" (Glasser & Strauss, 1966) vor, bei der man sich zuerst Fragen stellt, dann qualitative und quantitative Daten sammelt, damit die Fragen weiter verfeinert und schließlich eine Theorie entwickelt. Dieser Prozess ist aus den fünfzehn Büchern, die Tomatis schrieb, ersichtlich, sowie aus den vielen Artikeln und Konferenzvorträgen und aus den vertraulichen Aufzeichnungen, die aus seiner Arbeit mit Tausenden von Klienten entstanden. Aus dieser spezifischen Frage entstand eine Theorie, Tomatis-Effekt genannt, die später um zwei Folgesätzen erweitert wurde, als das Elektronische Ohr entwickelt und mit Sängern eingesetzt wurde. Der Tomatis-Effekt ist die Basis der Tomatis-Methode.

Gesetz 1: Die Stimme enthält nur Frequenzen, die auch das Ohr wahrnehmen kann.

Gesetz 2: Wenn man dem Ohr die Möglichkeit gibt, die schlecht gehörten Frequenzen wieder korrekt wahrzunehmen, dann sind diese sofort und unbewusst wieder in der Stimme enthalten.

Gesetz 3: Durch eine über einen bestimmten Zeitraum vorgenommene Stimulation des Hörens kann das Gehör und die

Phonation dauerhaft verändert werden.

Der Tomatis-Effekt wurde 1957 unabhängig von Dr. Tomatis an der Sorbonne Universität wissenschaftlich verifiziert. Nachdem die Tomatis-Methode bei Sängern Erfolge zeigte, stellte sich die Frage, ob sie auch in anderen Kommunikationsbereichen Verbesserungen herbeiführen könnte. Die Antwort „Wir versuchen es“ führte zu weiteren Beobachtungen und zu weiteren Fragen, die zu möglichen zukünftigen Anwendungen führen. Das Zuhören wurde von Hören unterschieden und seine wichtige Rolle bei Kommunikation und bei Lernprozessen festgestellt. Sogar vor der Geburt beeinflusst das Hören die Entwicklung des fötalen Gehirns, da das Ohr nach viereinhalb Monaten der Schwangerschaft das einzige vor der Geburt voll entwickelte sensorische System darstellt. Es zeigt sich, dass das Ohr unabdingbar für die Entwicklung des Gehirns ist. Über achtzig Prozent der neuronalen Vernetzungen im Gehirn sind mit den auditiven und vestibulären Systemen verknüpft. Tomatis zeigte als Erster diese Bedeutung des fötalen Ohres auf und bezog sie in die Entwicklung der Programme der Tomatis-Methode ein.

Dr. Alfred A. Tomatis überließ uns als Vermächtnis die Tomatis-Methode und begründete das, was Dr. Susan Andrews und ich als “Das wachsende Feld das Klangtrainings“ beschreiben (IEEE Engineering in Medicine and Biology, Feb/März 1999). Die Mitglieder der IARCTC zollen Dr. Tomatis Anerkennung indem sie seine Arbeit weiterführen und Forschungen betreffend die Tomatis-Methode finanzieren und veröffentlichen. Diese Aufgabe ist für die breite Anerkennung durch die wissenschaftliche Gemeinde und durch jede, die über ihre Nutzung für die Gesellschaft entscheiden, unabdingbar. Die lebenslange Arbeit des Dr. Tomatis unterstützt alle, die auf sich, auf andere und auf ihre Umwelt hören. Gute Zuhörer können nicht nur besser Informationen von anderen empfangen, sie können auch ihre Ansichten besser ausdrücken, um so eine sichere und vernünftige Welt für uns alle zu schaffen.

TRIBUTO DE LOS MIEMBROS DEL IARCTC AL DR. ALFRED A. TOMATIS (1920-2001)

EL DR. ALFRED A. TOMATIS pasó la segunda mitad del siglo veinte desarrollando un método de estimulación auditiva y consulta que lleva su nombre. Fue Otorrinolaringólogo, filósofo, autor, psicólogo, educador e inventor, conocido mundialmente por una amplia variedad de aplicaciones en las que su método funciona. Como empresario, creo el Oído Electrónico, una máquina que tiene varias patentes en muchos países y que es la piedra angular de su método.

El Dr. Tomatis generó tanto controversias como alabos, lo primero porque cuestionó y amenazó creencias establecidas y lo otro porque su método facilita cambios deseados en la vida de las personas. Nos invitó a pensar de forma distinta acerca del potencial humano y de como la Escucha es la habilidad más básica de comunicación y aprendizaje. La palabra persona se origina de "per" y "son" (sonido) y cada uno de nosotros estamos representados por la forma en la que escuchamos y hablamos con sonido. Nuestros oídos también organizan el movimiento en un espacio tridimensional y debemos escuchar a nuestro cuerpo para movernos bien. Tomatis diseño una prueba de escucha para graficar las fortalezas y debilidades en la forma de escuchar la cual provee de información importante para el desarrollo de un programa Tomatis. Esto permite a aquellos que tienen el entrenamiento, observar cambios que ocurren durante y después de la participación en este programa. Tanto el Método como la Prueba de Escucha pueden ser temas de investigación publicados en esta revista.

Las contribuciones del Dr. Tomatis comienzan en los años cincuentas cuando descubrió un principio científico, conocido como Efecto Tomatis. Observó que un grupo de cantantes de ópera con los que trabajaba, no podían ya producir con su voz los sonidos, y requerían de una solución ya que sus trabajos se veían amenazados. Su descubrimiento vino después de que los tratamientos médicos tradicionales fallaron en mejorar sus voces, y comenzó a investigar preguntándose: Que mas puedo hacer? Sus pensamientos se enfocaron al audiómetro que utilizo para evaluar la audición de los cantantes. Esto fue una casualidad, que, como ahora sabemos, la causa del problema de voz no era la laringe, sino, el oído. Al revisar los resultados de la audición de los cantantes, noto cuan similar eran a los resultados de las prue-

bas aplicadas a los trabajadores y, el Dr. Tomatis hizo un gran descubrimiento. Los sonidos que faltaban en la voz de una persona eran idénticos a los que faltaban en el oído de la persona (como mostraban las audiometrías).

El Dr. Tomatis se hizo otra pregunta basado en esta observación: Puede la voz solo reproducir los armónicos contenidos en el oído? Se involucro en el proceso de investigación llamado "Teoría Fundamentada" (Glaser & Strauss, 1996), en la cual uno comienza por preguntarse, después, recopila datos cualitativos y cuantitativos y refina las preguntas, y de ahí, nace la teoría. Este proceso es visible en los quince libros escritos por Tomatis, los artículos, conferencias y protocolos desarrollados a partir del tratamiento de miles de clientes. Esta pregunta especifica evoluciono en la teoría conocida como "Efecto Tomatis", con dos corolarios agregados al tomar forma el oído electrónico y ser utilizado en los cantantes. El Efecto Tomatis es la base para el Método Tomatis.

Ley 1: La voz contiene solo los armónicos que el oído puede oír.

Ley 2: Si le das al oído la posibilidad de oír correctamente las frecuencias distorsionadas de sonido que no oye de forma correcta; estas son inmediata e inconscientemente restituidas al oído.

Ley 3: La audición impuesta y mantenida por un tiempo suficiente, resulta en la modificación permanente de la audición y fonación.

El Efecto Tomatis fue científicamente verificado de forma independiente del Dr. Tomatis en la Universidad de la Sorbona en 1957.

A raíz de la consiguiente utilización del Método Tomatis con cantantes, otros plantearon la pregunta de si podía ayudarlos mejorando otras áreas de comunicación. La respuesta: "Podemos intentar" resulto en mas observaciones y mas preguntas que continúan en el futuro acerca de mas aplicaciones.

La Escucha se distingue de la Audición y es reconocida por el importante rol que juega en otros procesos de aprendizaje y comunicación. Desde antes de nacer estamos escuchando e influenciando el desarrollo del cerebro fetal, ya que el único sistema sensorial completamente desarrollado ante de nacer, apareciendo a los 4 meses y medio dentro del proceso, es el oído. Pareciera que nuestros oídos son necesarios para que el cerebro se desarrolle adecuadamente.

Mas del 80% de las vías neurales conectan con los sistemas auditivo y vestibular. Tomatis propuso este rol del oído fetal y considero esta información al desarrollar los Programas del Método Tomatis.

El Dr. Alfred Tomatis dejo el legado del Método Tomatis y comenzó lo que describo como: "El Campo Emergente del Entrenamiento Auditivo" (IEEE Engineering in Medicine and Biology, Feb/Mar 1999). Los miembros de la IARCTC rinden tributo al Dr. Tomatis llevando el método hacia delante y promoviendo los fondos y publicación de la investigación sobre el Método Tomatis. Esta tarea es esencial para la aceptación de la comunidad científica en el ámbito mundial y para aquellos que determinan su inclusión en programas sociales para todas edades y tipos de gentes. El trabajo del Dr. Tomatis, apoya la escucha de la persona misma, de los otros y de su medio ambiente. Los que son buenos para escuchar, pueden recibir información de otros y expresar también sus propios puntos de vista para crear un mundo seguro y estable para vivir.

Historical Development of the Tomatis Method

The development of the Tomatis Method is shown below by a list of discoveries, publications, and technology patents (examples from US shown to represent timing of patents filed worldwide).

1944 - 49
- Audio-Vocal Cybernetics
- Professional Deafness among Singers

1949 - 51
- Electronic Ear without Automatic Balance
- Applications Observed

1951 - 53
- Electronic Ear with Gates and Electronic Controls
- Report to Professional Oto-Rhino-Laryngologie Society Paris
- Musical Ear Article Published French Journal ORL
- Correction of the Singing Voice Course at Faculty of Medicine in Paris

1953 - 55
- Intrauterine Listening
- Ontogenesis
- Phylogenesis
- Publications in French Journals and Courses

1955 - 61
- Applications in Other Fields – Physiological Problems, Linguistics, Articulation, Phonetics, Academics, Psychological
- Listening Test
- Tomatis Effect Proven Independently at the Sorbonne, 1957

1961 - 70
- Mother's Voice
- Intrauterine Life Problems
- Infancy Profound Problems
- *L'Oreille et le Langage* published 1963
- Dyslexia Article published 1967
- "Integration of Living Languages" Article published 1970
- US Patent 3,043,913 Apparatus for the Re-education of the Voice
- US Patent 3,101,081 apparatus for the Conditioning of the Auditory Lateralization
- US Patent 3,101,391 Apparatus for the Acoustic-Ambience Conditioning of a Medium
- Tomatis Method Made Available at Child Study Centre at the University of Ottawa 1968-1979

1970 - 76
- Bone Conduction Added (Vibrators)
- Auditory Physiology
- Ménière
- *Education et Dyslexie* published 1971
- *Le Libération d'Oedipe* published 1972
- Music of the Child presented at Regional Symposium of Music
- First Annual International Congress for Audio-Psycho-Phonology
- *Vers L'écoute Humaine*. Tome 1 and 2 published 1974
- "The Reeducation of the Voice – Different Methods of Treatment" published in *La Vie Médicale* in 1974
- "The Role of the Ear in Music Therapy" published in 1974

1976 - 78
- Three Integrators
- Listening Posture
- Phono-Cutaneous Reflexes
- Functional Neurology
- *L'Oreille et la Vie* Published 1977
- US Patent 4,021,611 Electronic Hearing Apparatus
- APP Congress in Montréal, 1978
- "Music and Neuro-Psycho-Physiological Effects" at the International Society for Music Education in London, 1978
- *Education and Dyslexia* English Translation by Louise Guiney 1978 (first English translation about AA Tomatis' work)

1978 - 85

- Precession
- US Patent 4,021,611 Audio-Vocal Integrator Apparatus 1980
- US Patent 4,327,252 Apparatus for Conditioning Hearing 1982
- Automatic, Mechanical Movements
- Begin work with MDS Health Group and set up Tomatis Electronics Canada
- Toronto Listening Centre opens 1978
- "The Ear and The Child" Presented at Conference at University of Ottawa, 1979
- "The Ear and the Difficulties of Learning," Montreal, 1979
- Symposium on APP at University of Potchefstroom, 1980
- *La Nuit Utérine* Published 1981
- "The psychological and sensory life of the fetus," Milan, 1984

1985 - 92

- Worldwide Expansion of the Method
- US Patent 4,615,680 Apparatus and Method for Practicing Pronunciation of Words by Comparing the User's Pronunciation with the Stored Pronunciation
- First US Center opens in Cleveland 1986, closes 1991
- Additional US Centers open in Phoenix and Tucson, AZ, Bethesda, MD, Dallas, TX, New Orleans, LA, Amherst, MA, Denver, CO, San Francisco, CA
- Translations of Books Into Five Languages
- *L'Oreille et la Voix* Published 1987
- *Les Troubles Scolaires* Published 1988
- *Neuf Mois Au Paradis* Published 1989
- *Vertiges* Published 1989
- *Nous Sommes tous Nés Polyglottes* Published 1991
- *About the Tomatis Method* published 1988 by Gilmor, Madaule, and Thompson, as Editors
- *The Conscious Ear* English Translation of *L'Oreille et la Vie* by Billie Thompson, 1991

1992 – 94

- AA Tomatis retires, Transfers Ownership of Tomatis International, S.A. to Christian Tomatis

1994 – 2000

- *The Ear and Language* English Translation of *L'Oreille et la Langage* by Billie Thompson, 1996
- Emergence of Diverse Groups Representing Different Methods and Equipment Based in the Tomatis Method
- Various Court Decisions Regarding Ownership of Rights and Right to Use Tomatis Name
- *Écouter l'universe* published, 1996
- "Emerging Field of Sound Training" appears in *IEEE Engineering in Medicine and Biology,* Mr/Ap 1999, first appearance in Medline of Tomatis Method
- Portable Mini Electronic Ear developed
- Set up Tomatis Developpement S.A. in Luxembourg and transfer ownership of all rights from Tomatis International S.A.
- Establishment of Internet sites about the Tomatis Method by a variety of certified and noncertified people

2001-2004

- Formation of IARCTC and adoption of Standards of Practice for the Profession
- Death of Dr. Alfred A. Tomatis
- Research protocols established for educational and clinical research
- Death of Christian Tomatis
- Standards of Practice assists Tomatis Consultant in a European Union country to demonstrate Tomatis Method as a profession and to receive government funding for a program
- Publication of *Ricochet*, Volume 1, Number 1

Language and Body Image

Alfred A. Tomatis
Excerpt from *The Ear and Language* (Used by Permission)

The deepest thing in man is his skin.

--Valery, L'Idée fixe

Perhaps the best definition of our concept of language is communication with another through the intermediary of Self. When we speak, no one is more amply informed than ourselves. To succeed we have to use our whole body, because that is what our world begins by. It is our body we first have to assure and convince of the truthfulness of our discourse. Our body lends itself to this game, and the word plays on it like a resounding instrument with multiple chords and infinite variations. The body obeys with incredible suppleness all the extravagances of our thoughts.

The human body is the instrument of language, and human language is the song that makes it resound. Man's body is the instrument man's thought uses to speak.

The body as a whole takes part in expression, simple as the means of it may be. The body contributes to expression through looks, through mime, through movements, through attitude, through the whole of our living and dynamic being. The body controls expression by hearing, by sight, by the skin, by all our senses sharpened to this exercise that, since our penetration into the world of sound, is the one that has done the most to make us human.

We transmit our language through the whole body. What we mean to communicate are not sounds, words, sentences, nor acoustic phenomena; what we wish to transmit are deeply felt sensations really lived within us by our sensory neurons, chords that our speech has sounded upon us with persuasion, precision, warmth, and enthusiasm.

We want to stamp with our seal the tactile impressions our speech makes upon the keyboard of our sensations.

We know vaguely and instinctively that these same chords will be transmitted to our listener. If he is caught up in our game, he cannot help but use his whole body to interpret and translate us. He unconsciously matches his expression-sensing apparatus to ours, while we keep him in resonance by means of our own chords.

To let our body sing is to transmit to other people our proprioceptive sensations. If the song is ample and harmonious, if it is supple and easily produced, it will transmit the warmth of a calm and powerful thoracic expansion; if it is narrow and strained, it will imprison us within the same anguish that blocks its emission.

The image of our body, that our spoken word permanently forms, is drawn and sculpted in its finest detail under our sonic touch.

We speak in order to give ourselves pleasure. We wrap ourselves in our acoustic mirror so as to get to know ourselves better. Our language models itself on our body, such as that body is defined in us, such as we conceive of it thanks to the information that we have available. There is a relative interaction here that reflects our own way of communicating with ourselves. Our choice of control, the virtuosity with which we are able to exploit our sensory keyboard, will determine the means by which we obtain information, which in turn will determine our means of control. A series of chain reactions all resulting from their common interreactions will thus unfold, accelerate, and enrich itself.

The image of our body, a reflection of our speech, is projected into space to the extent that the image of our speech bursts out of the image of our body.

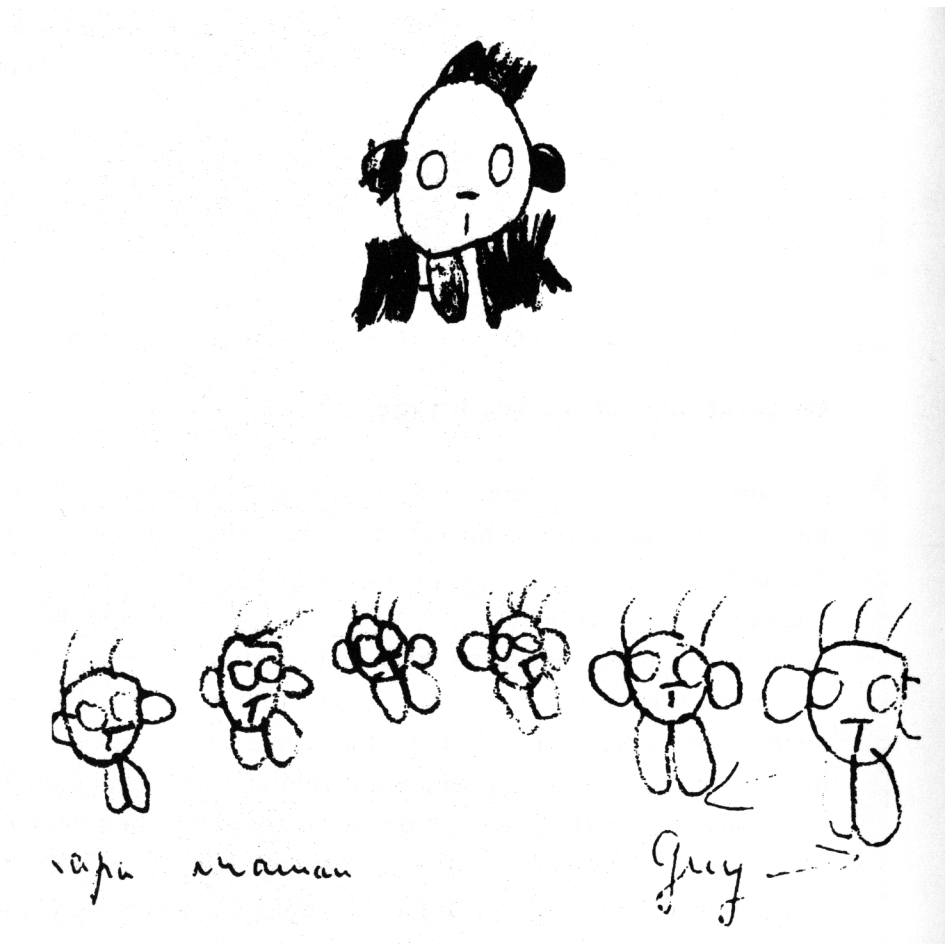

Figure 1: Picture of a man and family drawn before re-education.

Our bodily knowledge, sum of the knowledge of our expressions, will be solidly structured in proportion to its adherence to thought, as far as such adherence is humanly possible.

The resulting pyramidal and dynamic form of the Self that springs from this rests on the most substantively and unconsciously automatic corporeal bases. Superposed on it is the wise and fragile scaffolding of sensory control, master of the voluntary act, master of regulation, originator of laterality. The latter appears as the dynamic centralization of the act of control.

Clinical work offers us a case in point: a seven-year-old child is referred to us by a colleague, a pediatrician and psychiatrist, for considerable retardation in language associated with a serious intellectual deficit. Examination reveals a child of normal constitution, if anything, rather advantaged in stature, puffy faced and of poor mobility, quite turbulent in his behavior, and absolutely incapable of making himself understood, as all his words are mispronounced. Study of his laterality reveals bilateral responses, which are at the mercy of our young subject's fantasy and convenience. When we give him a drawing test and ask him to draw a man we observe a circle with a central spot: the global representation of his Self without differentiation of any part of his body. We decide to undertake an education of his language. As a result of this education, which is carried out under specified conditions with the help of electronic filters, we note language development in the child, despite his low intelligence quotient. At the end of three months his language becomes intelligible, right-handedness appears and the drawings the child makes of a man assure us of the progress in his body awareness. A head now surmounts the body and the limbs detach from the body with precision; feet and hands terminate the caricature. We return the child to his family at that time, forgetting or rather not knowing that he was to stay two or three days with a grandmother who was unconvinced or uninformed about our techniques. In a few hours, thanks to a few observa-

tions, no doubt pertinent in a schooling context but catastrophic for the psycho-sensory and psychomotor faculties we had tried to awaken in our little guy, his language falls apart as if by a spell. Nothing is left of what we had built. Laterality is replaced by the initial ambivalence, while the body schema is again translated by a poorly defined circle without differentiation of any kind. Without losing courage we take back our little patient. Rapidly in a few days everything is built up again, but we take the precaution of instructing the family.

Better than a long lecture, the experimental reconstruction of language demonstrates the evolutionary parallelism of the double acquisition of speech and body image.

It is from this reincarnation of the word that the sound of a language is born. As Father Jousse says, its rhythm and balance depend on it; its phraseology is confirmed by it; its syntax is founded on it; last but not least, its memorization depends on it.

From language and from it alone arises this conscious body that will speak. It is not without danger that such a lovely edifice is built, and the risk involved is born of the excessive pleasure we take in listening to ourselves. We then quickly forget what we wanted to say, in order to seek only the narcissist image inconsequentially stuck to the word, no longer adhering to thought. It is here that the myth of the tower of Babel finds new strength. Everyone had been using language only in order to see their own body. As we know, this cult of the individual was to put an end to the only hope we had of understanding ourselves and of conveying to ourselves the seed of unique and universal thought.

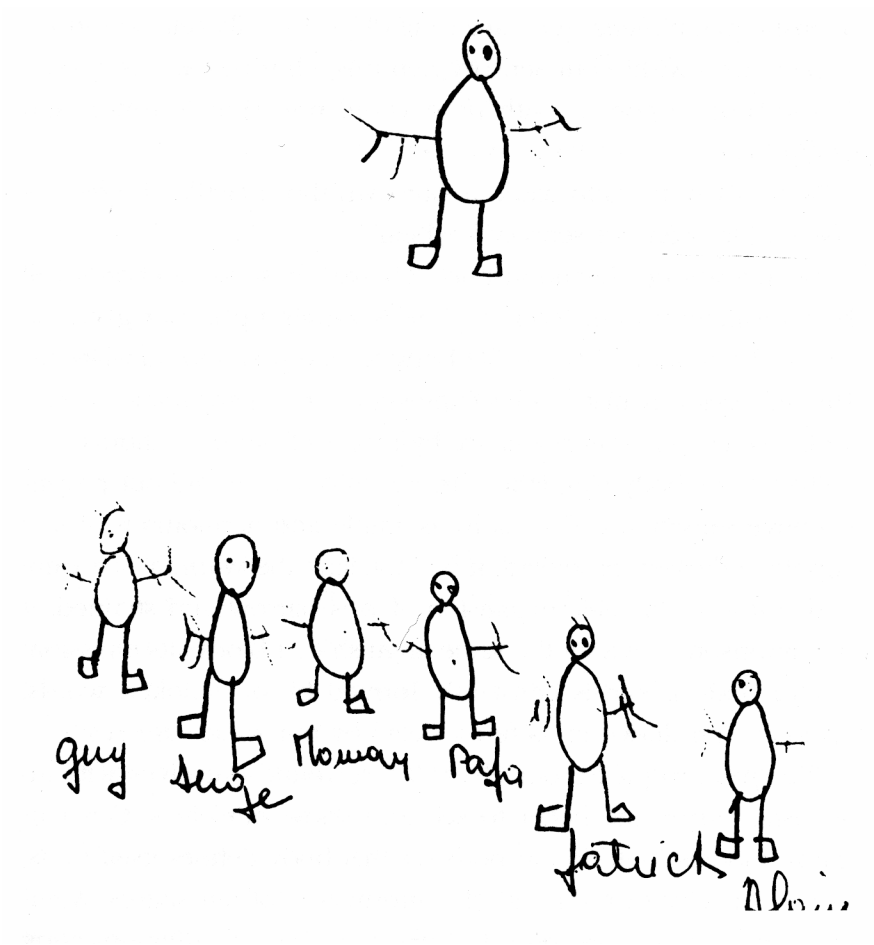

Figure 2: Picture drawn by the same child after fifteen hours of audiovocal conditioning.

We would like to keep the reader with us, let him touch with his fingers what we have described, let him experience by ever-renewed example each of our chapters, elaborate for him in detail the clinical and therapeutic characteristics only touched upon in these pages. In short, we would wish that by practicing all these techniques, where speech reigns supreme, our reader would become initiated into the world of language that completely absorbs all those who venture into it. But those who speak the same language are never completely separated from one another, and since happily, everything hasn't yet been said,

the best of encouragements still awaits us, i.e., that of a forthcoming encounter.

Have we managed to involve the reader in our subject? Will he know how to use his body to interpret us, to translate us onto his body? Have we ourselves been sufficiently convinced to convey to him in the rhythm of these resonances what we would like him to feel? Shall we hear him argue in his turn, with the same enthusiasm: "When you speak, sound pours from your mouth like water overflowing from a basin. It inundates and spreads over your whole body. Without your knowledge but nonetheless assuredly, syllable waves break and wash against you. The whole surface of your body marks their progress by the skin's sensitivity, which is controlled as if by a keyboard sensitive to acoustic touch."

The Tomatis Method, Listening Test, and Electronic Ear

Billie M. Thompson, Ph.D., RCTC
(Expanded version of the AFTERWORD of the English Translation of ***The Ear and Language*** *by Alfred A. Tomatis (1996)*

ONE COULD GENERALLY describe the Tomatis Method as a sound stimulation and educational intervention that improves the functioning of the ear, communication through language, desire for communication and learning, body image awareness, audio-vocal control, and motor control. It begins with an Initial Assessment, which includes tests of listening and lateral dominance and drawings. A consultation follows to review the results of the assessment and the detailed personal history, to determine appropriate goals for the person, and to recommend a program if one can be helpful in achieving the goals.

The human ear has the functional capabilities to do at least the following:

1. Perceive sound,
2. Process sound without distortion,
3. Discriminate between higher and lower sounds,
4. Perceive spatial origin of sounds,
5. Attend to sounds we want to hear and tune out ones we don't want,
6. Transmit energy (cortical charge) to the brain,
7. Integrate information from muscle movement,
8. Establish balance/equilibrium,
9. Stimulate neuro-vegetative balance,
10. Control phonation,
11. Control musical ability.

These functions can be altered at any age by accident, illness, or emotional trauma. By using the Method developed by Dr. Tomatis, it is possible to restore to the ears their essential effectiveness when the cause is not conductive or sensorineural damage. It should be noted that sometimes what appears to be solely an organic or sensorineural difficulty can be at least partly due to poor functioning, delayed development, or one's emotions. When poor functioning occurs, poor self-esteem, low motivation, and even depression may follow.

A well functioning ear is described as a good listening ear. It can tune in across the entire sound spectrum to sounds it wants to hear and tune out those it does not. It can perceive and analyze every part of the frequency spectrum with maximum speed and precision. It integrates muscle movement received from the entire body. A good ear is mirrored by a voice with good tone and quality. That is, a good voice reflects a good ear. We listen, speak, sing, read, write, and learn with our ears.

The Listening Test identifies the ears' functional abilities by evaluating strengths and weaknesses. It is possible to compare a person's listening to the ideal good functioning ear based on the following criteria:

1. Hearing threshold within normal range.
2. An open auditory selectivity to identify and compare higher and lower frequencies of sounds.
3. A precise auditory spatialization to identify the direction of the source of the sound.
4. An ascending curve slope up to 3000-4000 Hz with stabilization at this level and a slight drop in the highest frequencies, to allow easier discrimination between sounds.
5. An attention to externally perceived sounds we want to hear and the ability to tune out those we do not want, and the parallel perception of bone and air conducted sounds over the frequency spectrum.
6. Evenness of reception and an absence of distortion and stress in the response curve of the ear.

7. Balance of bone and air reception within and between both ears.
8. A right audio-vocal lead ear for the neurologically most efficient pathway directly to the speech center in the left brain hemisphere.
9. Vestibular integration of muscle and sensory information for effective motor coordination.
10. Reception of high frequency sounds to energize the brain.

The failure of one or several of these parameters provokes a disharmony that results in impaired listening and, consequently, deficient learning and self-esteem. Others who know a person (such as parents, teachers, and employers) can observe symptoms of poor listening in areas of receptive language, expressive language, motor control, and behavior/attitude.

According to Tomatis, a listening problem that is not the result of organic lesion is generally associated with a psychological origin. In thousands of case studies he observed that many clients experienced or described times in their early lives when there were refusals or reluctance to accept certain stimuli from the environment, specifically those of spoken language. These included separations from the natural mothers at an early age, disruptive home environments, physical and emotional abuse, and difficult births or pregnancies. These were times of emotional trauma, possibly coupled with physical trauma, and the closing out of such information was used as protection.

Shutting out information is actually possible. It manifests itself at the physiological level by a relaxation of the muscles of the middle ear. This state of flaccidness, akin to a "blinking" of the ear, considerably impedes the passage of sound. Unfortunately, it is not as easy for the ear as it is for the eye to open again. If the muscles of the middle ear are inactive for too long, they lose their muscle tone. Sounds are imprecisely perceived and, as a result, incorrectly analyzed. In other words, listening is impeded.

In order to assist the human ear to establish or re-establish its full potential, Dr. Tomatis developed and patented components of the Electronic Ear, special headphones with bone and air conduction, and special audio tapes to use with the Electronic Ear. He holds patents throughout the world, including seven in the U.S. (See The Conscious Ear for a listing of U.S. patents.)

The Electronic Ear and headphones use four mechanisms:

1. Filters to regulate sound so that the information is altered or modified inside the specific band of the good functioning ear in order to suppress distortion. Besides settings to extend the range of listening and speech as wide as possible, the filters can be set to improve reception for a particular language and to develop a musical ear.
2. The Electronic Gate en-ables the ear to attune itself automatically and spontaneously for listening. Stimulation of the middle ear is effected by the alternating passage of sound from one channel that relaxes the muscles to another channel that tenses or focuses the muscles. The alternation from one channel to another is automatically regulated by an electronic gate that opens and closes itself according to the varying signal. Repetition of the action over time maintains the ear's ability to perceive and analyze sound properly.
3. Balance control prepares the right ear for becoming the lead ear. Sound intensity fed via headphones to the left ear is progressively reduced.
4. Timing of sound reception is controlled to allow for gradual change to more efficient patterns of reception and processing.

Sessions with the Electronic Ear and interim tests and consultations are scheduled following the Initial Assessment. Usually it is better to begin with an intensive training, but a more extended initial program over a longer period can be used in some instances.

Each listening program has three phases: auditory (receptive) training, breaks for integration, and audio-vocal (expressive) training.

The first phase is primarily passive and opens up the ear to develop a better listening.

The second phase allows the person time to experience, integrate, and habituate the new listening patterns.

In the third phase, the person continues at a prescribed rate over several more weeks to develop the audio-vocal control necessary to maintain the gains independently of the Electronic Ear. This occurs with sufficient active session practice with one's own voice heard with a good

quality through the Electronic Ear and may require several eight-day audio-vocal intensives. This goes back to the premise cited in this book, that the voice can only produce what the ear can hear.

The length of program varies depending on the person's motivation, degree of difficulty, and neurological maturity and age. With many people who are very cut off from others (of which the autistic are the most disconnected) or who have suffered central nervous system damage, the treatment may extend over a year or longer with many breaks for integration. A typical length of program is 60 hours of listening sessions spread over several months, with the actual length determined at reassessment. One typically starts with a 15-day intensive, followed by a break of three to four weeks, then an eight-day intensive, followed by another break of four to six weeks, and another eight-day intensive.

During the training the person listens through the Electronic Ear to sounds of music and voice that have been electronically filtered to stimulate the improved focusing ability of the ear. By increasing the selective power of the ear, the person can perceive sound with less distortion and analyze it more precisely over the whole frequency range, from fundamental frequencies to the highest harmonics.

For a non-trained ear, the fundamental frequency of a sound too often masks its harmonic spectrum, and the person has difficulty in controlling voice timbre (the mix of higher harmonics). Consequently, the voice stays flat, with no modulation. By improving listening, the speaker has the opportunity to improve voice quality, fluency, modulation, and articulation, for their own personal benefit and others who listen. Implications for education and the workplace are vast. When one's voice conveys energy and interest to others, the invitation to listen is more readily accepted.The program can help the musician who is unable to adjust his or her ear to listen to the harmonics of the sounds emitted by voice or instrument to better regulate the melody. By listening to filtered music through the Electronic Ear, the muscles of the middle ear are trained to accommodate or attune to the higher harmonics of any sound source and gradually improve control of voice timbre.

Besides the ear, the whole body listens. Good listeners become aware of and acquire correct listening posture during the auditory-vocal training phase of the program. They develop an erect but not stiff spine, a slight forward tilt of the head with eyes closed, a relaxed neck and jaw, and open chest to allow ample breathing. The posture is easiest when sitting on a high stool or standing with the small of the back against a wall and when listening to the high frequency sounds of the filtered music.

Tomatis explored the many functions of the human ear and covered what follows in other books that followed *L'Oreille et le Langage*. For him, the ear is primarily a system to effect a cortical charge and to increase the electrical potential of the brain. Sound is transformed into nervous influx by the cells of the Organ of Corti in the inner ear, sent on to the brain cortex, and from there to the entire body to tone up the whole system and impart greater dynamism. Not all sounds give this charging effect. Tomatis points out that on the basilar membrane the cells of Corti are much more densely packed in the area responsive to high frequencies than in the area responsive to low frequencies. Therefore, high frequency sounds are more energizing than lower ones. In contrast, low frequency sounds not only supply insufficient energy to the cortex, but they may even tire the person by inducing motor responses that absorb more energy than the ear can provide. People who tend to be tired or depressed often have dull, toneless voices with very little high-frequency content. The energizing effect of high frequency music is helpful for people who have suffered strokes or other physical difficulties resulting in low energy.

Increased cortical charge from listening to high frequency filtered sounds results in improved motivation, greater ease in work, lower level of fatigue, increased sense of vitality, improved attention, concentration, and memory, and less required sleep. All of these factors, but particularly the increased abilities of concentration and of memory, can help the person considerably in improving communication and learning.

Tomatis demonstrates that the vestibular (balancing) and cochlear (decoding of sound) functions of the ear are joined in a single system. Anatomically, the vestibular nerve presents

itself at every level of the medulla, and is thereby directly connected with all the muscles of the body. Stimulation of the ear by filtered music affects body image and has many implications for learning, which requires awareness and control of the body, arms, wrists, hands, and fingers. Also, the vestibular system controls temporal-spatial awareness, which is required for rhythm and equilibrium.

Tomatis describes how the vagus nerve, the sensory auricular branch of the pneumogastric nerve, regulates through its branches the larynx, the pharynx, and the organs of the body. The auricular branch connects to the outer surface of the eardrum, thus forming a link between our inner, neuro-vegetative life, and the outside world. Clients often experience a balancing of the neuro-vegetative system, including sleeping and eating patterns, and must adjust medication doses as the nervous system becomes more efficient.

Sounds stimulate emotional states (such as fear) and somatizations (such as angina pectora, gastric and intestinal troubles, overeating, and anorexia). Listening to filtered music through the Electronic Ear enhances the tension of the tympanic membrane which, when tensed, attenuates the amplitude of the vibration of the sensory auricular branch, and in turn regulates the vagus nerve. This regulation is generally experienced as a sensation of well-being by the person, as a liberation from a heavy load with an ill-defined content. The client becomes more self-confident, more aware of abilities, more willing to use his or her voice from a position of empowerment rather than from inadequacy.

Audio-vocal sessions consist of repetition of words and phrases alternated with sessions of singing and music (filtered or non-filtered). The words and phrases progressively train the ear to listen for the entire harmonic range of sound information. During repetition, the client's voice is picked up by a microphone and modified by the Electronic Ear and instantaneously fed back to him or her by the earphones. The filters adjust the voice over the entire speech and musical spectrums to give high quality control and more efficient analysis of the sound. Because the larynx emits only those harmonics that the ear hears (proven at the Sorbonne in 1957 and known as the Tomatis Effect), the word, sentence, or musical phrase is emitted with greater control. When the ear listens well, the whole body is involved. Learning becomes easier, and more potential skill and intelligences can be developed.

As a follow-up to the audio-vocal program, the person is strongly advised to practice some phonatory exercises every day for a minimum of half an hour. The client is given an exercise of reading aloud while maintaining good audio-vocal posture and holding the right hand close to the right of the mouth to strengthen right audio-vocal dominance so the voice quality, rhythm, and flow will improve.

Once the person has completed just the passive phase of the program, he or she is much more able and motivated to work with teachers and other professionals, such as psychologists and psychiatrists, speech language pathologists, physical and occupational therapists, osteopaths and physicians whose specialties involve using language, posture, motivation, and motor control. The person is better able to learn in the formal traditional educational settings and to develop skills easily that once were very difficult.

While many researchers are just beginning to investigate and report on the impact of the ear in our lives, this book shows that Tomatis developed not just a theory but also a practical method to work at the source of many functional, emotional, and relational problems – that of poor listening. It is a Method that is surprisingly quick and has many long-range impacts on a person's health and well-being.

Effectiveness of the Tomatis Method in Improving Auditory Processing and Pre-Reading Skills in Normal K and First-grade Children

Susan R. Andrews, Ph.D., RCTC

A double-blind research study was approved for partial funding by the IARCTC Research Board. The study director is Dr. Susan R. Andrews, Ph.D., RCTC, who is a Clinical Neuropsychologist. Also on the research team are Dr. Michelle Trumps, DC, LOTR, RCTC and Dr. Billie Thompson, Ph.D., RCTC. The location is a public charter school in the USA.

The Board awarded support of two types to the research team:

1. Equipment to provide the Tomatis Method to the subjects in the study.

2. Funds to pay for pre and post tests by blinded testers.

The study began in January 2004 in a public charter school in the USA. The study was completed in May 2004, and the results will be published in a future issue of *Ricochet*.

The full title of the study is "The effectiveness of the Tomatis Method of Listening Training in improving auditory processing and pre-reading skills in normal kindergarten and first grade children, using a less intense program of stimulation that fits into normal school curriculum."

The purpose of the research is to demonstrate the effectiveness of Educational Listening Training in improving the learning abilities and reading readiness of a normal population of young school-aged children. A major goal of this research is to prove that a less intense program of stimulation can be effective for normal, young, pre-reading school children. The obvious importance of this proposal is that if improvements in pre-reading skills can be demonstrated using only an hour a day for 60 days, then it becomes possible for the Tomatis Method to be integrated as a normal part of the reading curriculum in classrooms all over the world.

The areas of pre-reading that are expected to improve are the following:

1. Auditory processing
2. Visual memory
3. Basic attention and concentration

Year 1 Pilot Study: Use of Tomatis Method with Japanese High School Students Learning English as a Foreign Language

Kuniko Murase, RCTC

Kanto Kokusai High School in Tokyo, Japan provides training in the foreign languages of English, Chinese, Russian, and Korean. In 2003, Kanto Kokusai HS was selected as ìSuper English Learning High Schoolî by the Japanese Ministry of Education and Science and received financial aid for a three year pilot program to use the Tomatis Method for teaching English as a foreign language. A ten-week Tomatis Method pilot program was provided by teachers Yoko Miyoshi and Kana Matsumura between April 15 and July 10, 2003 to one class of students in their regular classroom (n = 40). Three other classes (in = 120) used Classical English Language Training. The five Tomatis Electronic Ears, headphones with bone and air conduction, and other related equipment were put away and not available to the Classical English Language Groups when they used the classroom in which all four classes met.

In the pilot study it was assumed that the two groups were at the same pre treatment level before the training. Despite the lack of standardized pre assessment for both groups, the initial pilot study provides several outcomes of value. The researchers were able to test the equipment, train the teachers to use it, preview test administration, observe studentsí reactions to the equipment and materials, and integrate Tomatis Method training into the classroom and curriculum. These are important findings related to school use of the Tomatis Method. Also, the performance of the students in the Tomatis Method group is encouraging because they advanced in every measure on the assessments provided. This first year of the pilot program provides information from which to make a more rigorous research design for the third year.

Reported here is information about the results of the first year pilot that indicate a more rigorous study could be done.

DESCRIPTION OF TOMATIS METHOD TRAINING

Several types of listening and vocal training practice were used only with the Tomatis Method program:

1. Listening through the Electronic Ear for 45 hours (4.5 hours per week) to a variety of filtered and non-filtered sounds. The content of the sound was provided by the manufacturer, Tomatis Dëveloppement, on CDs and consisted of the following:

   a. Portions of the English translation of *The Little Prince* read aloud by a native North American English speaker, used for passive listening.

   b. Text, words, and phrases spoken by North American and Canadian voices, used for repetition by the students.

   c. American folk songs for children for passive listening.

   d. Mozart for passive listening.

   e. Gregorian Chant for passive listening.
2. Instruction for using good listening posture.
3. Homework of reading aloud Japanese text.

One type of audio-vocal practice (practice speaking English with Native American English teachers) was used 50 minutes each week by the Tomatis Method Group and 100 minutes by the Classical English Language Group.

PRE AND POST MEASURES FOR TOMATIS METHOD GROUP ONLY

Tomatis Listening Test

Pre and post Tomatis Listening Tests were completed by Certified Tomatis Consultants for the Tomatis Method Group. Studentsí individual thresholds of listening perception for each air conduction and bone conduction frequency stimulus were measured pre and post English

language training and then combined to make group average pre and post threshold curves shown separately for right and left ears (Figure 1).

The post Tomatis Listening Tests indicated improvement in group ability to more easily perceive the sounds spoken in the target language, which for American English is in the range of 750 Hz through 3000 Hz, with the overtones of the English language extending upward. T-Tests compared pre and post individual combined frequency scores of results in Figure 1 and showed significant improvement of perception at least at the .05 level for the frequency range of 2000 Hz to 6000 Hz in the left ear and 4000 Hz in the right ear. This is indicative of improved perception in the English language range and also in the overtones of the language in the left ear. It is interesting that most of the changes are in the left ear, which supports the theory that the right brain controls more learning a second language, while the left brain controls more using oneís native language.

Sonograms

Students in the Tomatis Method Group each recording their voices speaking English on audiotape as a sonogram. Specific reception curves for several languages were identified by Dr. Alfred A. Tomatis using sonograms, and they were reported in *LíOreille et la Vie*, 1977, and *Nous Sommes Tous Nés Polyglottes,* 1991. According to Tomatis, native speakers of a language have a more attuned listening perception to a specific range of frequencies emphasized within their native language. At the same time, a language spoken natively in one country may sound different spoken natively in another country. For example, American English spoken in the United States sounds different than British English spoken in the United Kingdom.

Native American Teachers, who were not blind to the treatment, evaluated three aspects of English speaking competency from the sonograms (fluency, pronunciation, and intonation) with the pre and post results shown in Table 2.

PRE AND POST MEASURES FOR COMPARING TOMATIS METHOD GROUP WITH CLASSICAL ENGLISH LANGUAGE GROUP

School English Comprehension Proficiency Test

Kanto Kokusai High School tested the Tomatis Method Group and one of the Classical English Language Groups on a competency of general English comprehension shortly after the pilot program started. Table 3 shows English language proficiency group average percentage scores and the number of treatment hours completed by each group prior to test. This is included here to document that one third the time was needed for the Tomatis Method Group to score slightly higher than the Classical English Language Group.

Figure 1. Averaged Group Listening Perception Thresholds from Pre and Post Individual Tomatis Listening Tests of Tomatis Method Group (n = 40)

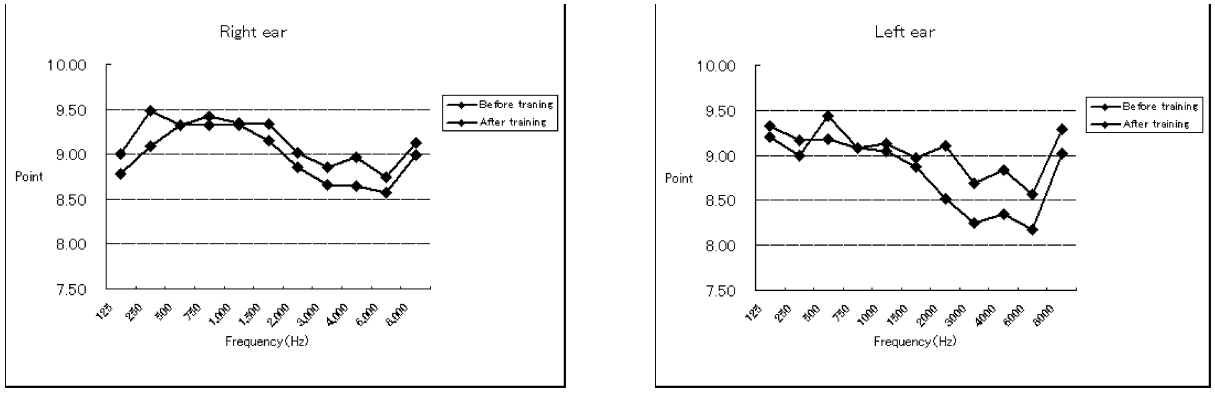

Table 2: Group Average Improvement of Pronunciation

Aspect of competency	Point maximum	Pre Tomatis	Post Tomatis
Fluency	5	3.25	3.5
Pronunciation	5	2.98	3.57
Intonation	5	2.98	3.82
Average total items		3.08	3.80
Standard deviation		0.78	0.57 (>.001)

Table 3: Two Group Comparison of English Language Proficiency Test by % of Correct Answers

Group	Hrs of Classically Taught Lessons Prior To Test	% Correct Answers
Tomatis Method Group (N = 40)	11	78%
Classical English Language Group (N = 39)	33	72%

Assessment of Communicative English (Authorized Official Test)

Assessment of Communicative English published by the Association for English Language Proficiency Assessment was given at Kanto Kokusai High School students on April 30, 2003 (after nine hours of Tomatis Method training) and again on January 18, 2004 (after completion of Tomatis Method training). This 80 minute timed test has norms for Junior High School, High School, College, and University levels. 98 questions are divided into Part 1: Listening (300 points) and Part 2: Vocabulary, Grammar (300 points) and Reading (300 points) for a total of 900 points.

Pre and Post Scores showed the Tomatis Method Group improved to a higher ranking over the nine months following initial testing, going from 8th to 5th rank, whereas the Classical English Language Group did not advance as much, going from 11th to 10th rank.

An informal report said several students in the Classical English Language Group had recently returned from the USA, which gave some ranking advantage over the Tomatis Method Group, in which none of the students had studied abroad.

CONCLUSIONS

The data indicates support for setting up a rigorous research design for the third year of the pilot study, which begins April 2005 and ends March 2006. The design could include several pre and post standardized measures, blind assessment, and random assignment to establish greater significance of results. A good description of both treatments is also necessary.

The Impact of a Combined Tomatis and Psycho-Educational Program on Weight Preoccupied, Female South African Students

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ABSTRACT

THIS INVESTIGATION WAS AIMED at evaluating whether the Tomatis Method (TM) and a Psycho-Educational Program (PEP) would reduce weight preoccupation, decrease negative mood states and enhance psychological well-being among weight preoccupied, female students of North-West University, a peri-urban institution. A three-group, pre-post-assessment design was used. Twenty-one students meeting criteria for weight preoccupation were recruited. Assessment involved the Profile of Mood States, Sense of Coherence Scale, Tennessee Self-Concept Scale and Eating Disorder Inventory. Participants were assigned non-randomly to Group 1 (TM + PEP), (n = 7); Group 2 (PEP only), (n = 7) and a non-intervention control group (Group 3, n = 7).

Group 1 attended 40 half-hour sessions of Tomatis stimulation, followed by a brief psycho-educational program. Group 2 only attended the PEP.

Since both programs resulted in significantly reduced weight preoccupation and enhancement of aspects of psychological well-being, while negligible change occurred within the control group, their efficacy was partially proved. Limited by time constraints, program specific strengths need expansion and re-scrutiny in further research with larger, multicultural samples of weight preoccupied females.

RÉSUMÉ

Cette recherche vise à évaluer si l'association de la Méthode de Tomatis, programme d'intégration neurosensorielle et un programme Psychopédagogique a pour effet de diminuer le souci concernant le poids, de réduire les états d'esprit négatifs et d'améliorer le bien-être psychologique parmi des étudiantes soucieuses de leur poids. La recherche s'est faite sur trois groupes avec une évaluation pré et post expérience. On a recruté vingt et une étudiantes, qui présentaient des problèmes de poids et s'en tracassaient. Les outils d'évaluation suivants ont été utilisés: le Profil des Etats d'Esprit, l'Echelle de Cohérence, l'Echelle du Concept de Soi de Tennessee et l'Inventaire des Désordres alimentaires. Les étudiantes ont été réparties en 3 groupes :

Groupe 1 (Méthode Tomatis + le programme Psychopédagogique), (n=7);

Groupe 2 (le programme Psychopédagogique seulement), (n=7)

et un groupe de contrôle ne bénéficiant d'aucune intervention (Groupe 3, n=7).

Le Groupe 1 a participé à 40 séances d'une demie heure avec la Méthode de Tomatis, pendant une période de trois semaines et a ensuite assisté à 4 séances du programme Psychopédagogique. Le Groupe 2 a seulement bénéficié du programme Psychopédagogique. Le niveau d'inquiétude concernant le poids a significativement diminué dans les deux groupes expérimentaux, mais le niveau du bien-être psychologique est resté inchangé dans les deux groupes. L'utilité des deux programmes a été partiellement prouvée, du fait que tous les deux ont induit une dim-

inution significative de la préoccupation concernant le poids. L'étude ayant été limitée due à des contraintes de temps, il faudrait faire une recherche plus extensive et minutieuse en tenant compte des qualités de chaque programme et en l'appliquant sur des échantillons plus grands et multiculturels, avec des étudiantes concernées par leur poids.

ZUSAMMENFASSUNG

Diese Untersuchung zielt darauf ab festzustellen, ob eine Anwendung der Tomatis-Methode (TM) und eines psycho-pädagogischen Programms (PEP) die Gewichtsprobleme verringern, den schlechten Stimmungszustand reduzieren und das psychische Wohlbefinden bei Studentinnen der Nord-West-Universität, einer stadtnahen Institution, verbessern könne. Ein Verfahren mit drei Versuchsgruppen in einem Vorher-Nachher-Vergleich wurde eingesetzt. Es wurden einundzwanzig Studentinnen, die den Kriterien der Gewichtsprobleme entsprachen, ausgewählt. Die Evaluierung umfasste das „Profil der Stimmungslagen", die Skala „Sense of Coherence", die „Tennessee-Skala des Selbstkonzepts" und die „Klassifikation von Essstörungen". Die Versuchspersonen wurden nicht-zufällig in Gruppe 1 (TM + PEP), (n=7), Gruppe 2 (nur PEP), (n=7) und eine Kontrollgruppe ohne Intervention (Gruppe 3, n=7) aufgeteilt. Die Gruppe 1 nahm an 40 halbstündigen Tomatis-Sitzungen teil, gefolgt von einem kurzen psycho-pädagogischen Programm. Gruppe 2 besuchte nur an das PEP.

Da beide Programme die Gewichtsprobleme deutlich reduzierten und das psychische Wohlbefinden signifikant verbesserten, während die Kontrollgruppe vernachlässigbare Änderungen zeigte, wurde ihre Effektivität teilweise bewiesen. Zeitliche Einschränkungen und die Auswertung programmspezifischer Stärken erfordern ausgedehntere Untersuchungen in weiteren Forschungsarbeiten mit größeren, multikulturellen Proben von Studentinnen mit Gewichtsproblemen.

RESUMEN

Esta investigación esta dirigida a evaluar si una combinación del Método Tomatis de entrenamiento de integración sensorioneural y un Programa Psico-Educacional, pudieran resultar en una reducción de la preocupación relacionada con el peso, disminución de estados de animo negativos y aumento de bienestar psicológico en estudiantes del sexo femenino.

Se utilizo un diseño pre-post evaluación en tres grupos. Se reclutaron veintiún estudiantes que cumplían el requisito de preocupación por su peso. La evaluación se llevo a cabo por medio de los siguientes instrumentos: Perfil de Estados de Animo, Escala de Sentido de Coherencia, Escala Tennessee de Auto Concepto y el Inventario de Trastornos de la Alimentación. Después se asignaron en forma no aleatoria al Grupo 1 (Método Tomatis y Programa Psico Educacional) (n=7); Grupo 2 (Programa Psico-Educacional) (n=7); y un grupo control sin intervención (Grupo 3) (n+7).

El Grupo 1 atendió 40 sesiones de media hora del Método Tomatis durante 3 semanas y después 4 sesiones del Programa Psico Educacional. El Grupo 2 atendió solo las 4 sesiones del Programa Psico Educacional. La preocupación por el peso se redujo en forma significativa en los dos grupos experimentales pero el bienestar psicológico no mostró cambio.

La utilidad de ambos programas se comprobó parcialmente, ambos resultaron en reducción significativa de la preocupación con el peso. Como el estudio tenia limitaciones de tiempo, la fortaleza especifica del programa necesita expandirse y revisarse en investigación sobre muestras mayores y multiculturales son la misma preocupación sobre el peso.

INTRODUCTION

EATING DISORDERS AND eating disorders not otherwise specified (APA, 1994), including weight preoccupation, represent a significant health concern in modern Western society. This is particularly true amongst students, men and westernized black women (Biby, 1998; Brazelton, Greene, Gynther & O'Mell, 1998; Butters & Cash, 1987). Western women are often perceived as successful, beautiful and acceptable only when meeting the "thin ideal" female body image, often totally unrealistic, and hence unattainable (Brazelton, et al., 1998; Brownell, 1991). Failure leads to body dissatisfaction, associated with chronic dieting, weight preoccupation and compromised psychological well-being (Brownell, 1991; Har-

ris, 1995; Polivy & Herman, 1987; Senekal, 1994). A diminished sense of psychological well-being may manifest itself in poor self-acceptance, inability to resist social pressures, low self-esteem, lack of vigor, anxiety, depression, and difficulties in forming meaningful relationships and facing life's challenges.

Extensive research has been conducted on causes, effects, and treatments of eating disorders like anorexia, bulimia nervosa, and obesity. However, research on weight preoccupation per sé has been limited, presumably since society accepts it as being normal (Polivy & Herman, 1987). Given the high incidence of weight preoccupation among female clients/students, the high risk of developing full-blown eating disorders, and the fact that no single effective treatment with lasting effect has been devised, our study was deemed appropriate. We resolved to evaluate the impact of a twofold intervention on weight preoccupied students. It was assumed that the sound training and consultation of the Tomatis Method (TM) (Tomatis, 1987, 1991, 1994) would relax weight preoccupied persons and rekindle their inner motivation, thus enhancing openness to a brief Psycho-Educational Program (PEP), based upon an eclectic, integrated approach.

Eating disorders, sub-clinical eating disorders, weight preoccupation, and body dissatisfaction are terms often used in combination or intertwined, causing confusion as to what is implied. Weight preoccupation is defined by Garner et al., (1984) in terms of cognitive aspects (i.e., a persistent over-concern with body shape and weight) and behavioral aspects (i.e., chronic dieting) resulting in negative affect (affective aspects). In differentiating eating disorders from weight preoccupation, Nylander (1971) suggested a continuum hypothesis after finding that the majority of adolescent girls in his study perceived themselves as being overweight, while only 10% presented with eating disorders. Thus, weight preoccupied individuals do not necessarily meet criteria for eating disorders, whereas all individuals diagnosed with eating disorders are weight preoccupied (Oates-Johnson & De Courville, 1999).

Since eating disorders imply weight preoccupation, partially overlapping etiologies may be assumed. Societal pressure, perfectionism, family dynamics, including overemphasis on achievement and physical appearance, and genetic predisposition are reported as etiological causes of eating disorders, thus possibly also accounting for weight preoccupation. Additionally, irrational thoughts and beliefs about body shape and weight impair conceptualization of realistic self- and body images or attitudes associated with control of bodily and eating behavior (Mintz & Betze, 1988; Senekal, 1994). Irrational beliefs are also associated with poor self-awareness and inability to regulate mood and affect, leading to feelings of inadequacy, negative self-concepts, negative body images and self-ideal-discrepancies. (Brazelton et al., 1998; Butters & Cash, 1987; Philips, 1991). Personality traits also increase the risk of weight preoccupation. Oates-Johnson and De Courville (1999) identified 'sociotropic' individuals, presenting with exaggerated needs for love, affection, approval, and encouragement; oversensitive to interpersonal criticism and attempting to gain self worth by pleasing others, and rigidly adhering to traditional female roles.

Due to multifactorial causes and complexities associated with treatment of eating disorders and weight preoccupation, a burgeoning array of therapies has been developed, some of them also relevant for WP. Psycho-education, cognitive behavior therapy, narrative therapy, interpersonal therapy, family therapy and pharmacological therapy, have all been used partially successfully in treating eating disorders, yet often without lasting effects (Balthrop, 1996; Butters & Cash, 1987; Garrett, 1998). Clearly an innovative, holistic approach is called for. Since weight preoccupation consists of cognitive, behavioral and affective aspects it was decided to combine the TM with a PEP, assuming they would complement each other.

Though the training manual of the TM acknowledges its applicability to eating disorders, (Centre Tomatis, 1995) no rationale is therein provided. However, high anxiety, low self-esteem, poor self-awareness (interoceptive) and perfectionism is prevalent in potential eating disordered and weight preoccupied individuals (Davis, 1996). The TM is associated with anxiety reduction (Du Plessis & Van Jaarsveld, 1988) and self-esteem enhancement (Gilmor, 1982; Rourke & Russel, 1982).

Thus, if the sound stimulation of the TM could result in anxiety reduction, it might induce lowered perfectionism, which could render participants more susceptible for the impact of the PEP, tailored to issues underlying weight preoccupation

Since recent studies involving the TM have demonstrated that reduction of negative affect coincided with enhanced psychological well-being (Coetzee, 2001; Akakios, 2002), albeit with non weight preoccupied individuals, it was decided to include a measure of general psychological well-being, too. Conceptualizations of psychological well-being, an elusive construct, have lead to various holistic models, mainly focusing on a combination of intra-psychic as well as interpersonal qualities, including affective, spiritual, physical, cognitive, self and social aspects (Antonovsky, 1993; Diener, Emmons, Larsen & Griffen, 1985; Roothman, Kirsten & Wissing, 2003; Ryff & Keyes, 1995; Ryff & Singer, 1996; Suominen et al. 2000; Wissing & Van Eeden, 2002; Witmer & Sweeny, 1992). These authors have proposed that psychological well-being essentially entails life satisfaction, a sense of coherence (a sense that life is meaningful, manageable and comprehensible) as well as purposefulness in life. It also entails the absence of severe forms of negative affect such as anxiety and depression, affect balance, as well as a general attitude of optimism or positive life orientation and good physical health (Diener, 2000; Ryff & Singer 1998). Other characteristics of psychological well-being are the ability to regulate behavior and social pressures from within (autonomy), to allow improvement in self and behavior over time (personal growth), as well as the ability to face up to life's challenges (Ryan & Deci, 2001; Ryff & Keyes, 1996). Self-acceptance, positive self-regard, as well as quality and meaningful connections to others, and being able to manage everyday affairs and relationships are also emphasized (Ryan & Deci, 2000; Ryff & Keyes, 1996).

The brief Psycho-Educational Program, constructed from relevant threads of current eating disorder therapies and presented within a psycho-educational context, was grounded in the following assumptions:

1. Expanding participants' awareness of subtle, unceasing media enticements to conform to society's unrealistic thin ideal, would reduce their defensiveness and increase motivation to articulate an informed, personal stand to protect themselves from societal/media "onslaughts." Numerous examples from popular local fashion magazines would explicate the situation.
2. Increasing awareness of irrational thoughts and beliefs associated with weight preoccupation and stimulating cognitive restructuring, by means of cognitive behavioral methods, would break the vicious cycle of low self-esteem, dysfunctional thinking, and abnormal eating behavior (Beck, 1991).
3. Societal pressure further reduced by exploring alternatives for problem identities through a narrative approach (Balthrop, 1996; Garrett, 1998).
4. Addressing adverse effects of family dynamics, i.e., a need for love and approval ("I'm OK") and tendencies to gain self-worth by pleasing others ("games") by transactional analytic methods (Berne, 1964). Learning to allow a situation to determine which of the three ego states ought to be in control, so that an even balance among the three might be achieved, could lead to self-nurturing behavior, self-approval, diminished sensitivity to criticism, and a well-adjusted life.

In light of these assumptions, the investigation was aimed at assessing whether a combined Tomatis and PEP would lead to: (a) statistically significant reductions in weight preoccupation and negative mood states, exceeding that of Group 2 (the PEP-only group) and Group 3 (the control group); (b) statistically significant enhancement of psychological well-being, exceeding that of Group 2 (PEP-only group) and Group 3 (the control group). The following was hypothesized: (a) participation in a combined Tomatis and PEP would reduce weight preoccupation and negative mood states, and enhance psychological well-being; and (b) that differences would significantly exceed the impact of the PEP, applied on its own.

METHOD

Research design

A three-group pre-post-assessment design was used.

Participants

Twenty-one weight preoccupied female students from North-West University's Potchefstroom campus were recruited and assigned (non-randomly, because of their schedules) to Group 1 (Tomatis stimulation + PEP), (n = 7); Group 2 (PEP only), (n = 7); and Group 3 (control group), (n = 7).

Inclusion criteria

(i) Signs of both body dissatisfaction (as measured by the Body Dissatisfaction and Drive for Thinness subscales of the Eating Disorder Inventory (EDI) with higher scores reflecting more severe manifestations of weight preoccupation;

(ii) Repeated attempts to lose weight;

(iii) Not meeting the DSM IV criteria for formal eating disorders like anorexia and bulimia nervosa (American Psychiatric Association, 1994).

Procedure

The study was introduced in undergraduate psychology students' contact sessions and in female dormitories. Prospective participants completed the Eating Disorder Inventory (EDI) and a biographical questionnaire, individually or in small groups after confirming interest in the project. Items were scored according to EDI guidelines. Of 27 prospective participants initially screened, one was excluded for meeting the criteria for bulimia nervosa. Twenty-one completed the pre-post assessment.

Written informed consent was obtained from participants after being informed about the study. Pre-assessment followed. Group 1 commenced with the combined program. Forty half-hours of the TM were attended, followed by the brief PEP. Group 2 attended only the PEP. Group 3 was a non-intervention control group. Post-assessment was completed at one month post-program.

Measuring instruments

The Eating Disorder Inventory (EDI) is a 64-item self-report instrument consisting of 8 subscales designed to assess psychological and behavioral characteristics associated with anorexia and bulimia nervosa (Garner, Olmsted & Polivy, 1983). Three subscales (Drive for Thinness, Bulimia, and Body Dissatisfaction) assess attitudes and behaviors regarding eating, weight and body shape. The remaining subscales (Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, and Maturity Fears) reflect psychological traits relevant to eating disorders. The Drive for Thinness items assess excessive concern with dieting, preoccupation with weight, and fear of weight gain (Garner, Olmsted & Polivy, 1983). Items were scored according to EDI guidelines, with higher scores reflecting more severe manifestations. A reliability coefficient of 0.90 was reported by Garner et al. (1983). In the current study an alpha coefficient of 0.80 was obtained, indicative of high reliability.

The Profile of Mood States (POMS) is a checklist of 65 items, measuring mood states including Tension-Anxiety, Depression-Dejection, Anger-Hostility, Vigor, Fatigue and Confusion (McNair, Lorr & Droppleman, 1992). Adequate test-retest reliability, internal consistency and construct validity are reported (McNair et al., ibid.). In the current study, high Cronbach alphas were obtained for Tension-Anxiety (0.87), Depression-Dejection (0.95), Anger-Hostility (0.92), Vigor (0.86), Fatigue (0.82), and Confusion (0.82), comparing well with Coetzee's (2001) finding of Cronbach alphas of: Tension-Anxiety (0.87), Depression-Dejection (0.89), Anger-Hostility (0.89), Vigor (0,49), Fatigue (0.88) and Confusion (0.64).

The Sense of Coherence Scale (SOC) of Antonovsky (1993), a reliable indicator of general psychological well-being, measures a global, pervasive orientation to life, grounded in the idea that life events are comprehensible, manageable and meaningful. In this study, an alpha coefficient of 0.93 was obtained, which compares favorably with internal consistency indices ranging from 0.74 to 0.93 reported by Antonovsky.

The Tennessee Self-Concept Scale (TSCS) of Roid and Fitts (1989) incorporates five components to attain a global indication of self-concept, including: Physical Self, Moral-Ethical Self, Personal Self, Family Self and Social Self. In the current study, a high reliability coefficient of 0.71 was obtained.

The Tomatis program

Group 1 attended the Tomatis program over a three-week period, listening to four sound stimulation sessions per day, four days a week but merely averaged 41 half-hour sessions, due to approaching year-end examina-

tions. The Tomatis program consisted of:

1. The passive phase of listening to Mozart's violin concertos, during which low frequencies were gradually filtered from the music by means of the Electronic Ear (Model A1). During this phase the participants' hearing was exposed to "micro-earobics," an exercise of the middle ear muscles to enhance listening. The sound was also progressively focused on the right ears, to establish or strengthen right ear dominance (Madaule, 1994; Tomatis, 1991).
2. The active phase of audio-vocal stimulation followed, during which the participants sat upright and articulated sentences into microphones, while their voices were enriched in the middle and high frequencies by the Electronic Ear (Tomatis, 1991; 1994). Rapid transition from passive to active phase was in keeping with the training philosophy of the Paris Tomatis Center (Altar, 1995). To prepare participants for the PEP, which involved, inter alia, positive self-talk, they read brief, self-affirming statements conducive to stimulating positive attitudes and expectations (Cameron, 1999), which would arguably orient them positively for the PEP. Reading activity commenced at session 30, took place every fourth session and lasted 10 minutes, after which they resumed listening to non-filtered music, followed by filtered sound.

Psycho-educational program

This component consisted of four group sessions, of one-and-a-half hour's duration each. Initially six sessions were planned, but the program was condensed, in view of participants' tight academic schedules and time spent attending Tomatis sessions.

Aims and techniques of the four sessions were:

Session 1

Clarifying the group structure, rules and role of group leader; exploring core issues underlying weight preoccupation, i.e., media portrayal of idealized female figures; challenging participants to adopt a personal stance.

Session 2

Expanding awareness of irrational thoughts underlying negative self-worth and self-image, and challenging them to reconstruct rigid self-perceptions and enhance interoceptive awareness.

Session 3

Encouraging transcendence of constraints associated with WP by reapportioning daily activities in terms of cognitive, physical, social and spiritual activities to focus away from themselves.

Session 4

Teaching behavioral and cognitive skills associated with eating, by engaging in a surprise party with calorie enriched refreshments; elucidating adverse family dynamics by applying TA principles; discerning ego states dominating eating behavior, i.e., impulsive child, critical parent, adapted child uncritically "swallowing" social expectations, and rational adult, eating in terms of realistic, self controlled eating behavior; and role playing various ego states, to amplify the learning experience.

RESULTS

Statistical computation

The SAS/STAT System for Windows release 6.12 (1996) was used for the statistical analyses. Descriptive statistics and Cronbach alpha reliability indices were computed for each scale and/or subscale. Significance of differences within groups was computed by means of Wilcoxon's sign rank test, and between groups by means of Post hoc comparison (Cohen, 1977). Although the use of p-values was irrelevant, since the study was based on availability samples, p-values were noted, together with Cohen's d-values (Cohen, 1977). Effect sizes of ($d \geq 0.5$) were regarded as indicative of a tendency towards practical significance, while an effect size of ($d \geq 0.8$) indicated large practical differences.

Pre-treatment group equivalence[1]

Pre-treatment group equivalence was clearly established for weight preoccupation, as indicated by the EDI subscales of Drive for Thinness and Body Dissatisfaction. A limited number of large practical differences occurred on other indexes of pathology as well. On the Profile of Mood States (POMS), Depression-Dejection and Anger/Hostility scores were practically significantly higher in Groups 1 and 2 than in Group 3. On the Tennessee Self-concept scale

1. Full statistical data available from principal author.

(TSCS) Moral-Ethical Self and Family Self scores were practically significantly higher in Group 2 than Group 1. Significantly, all participants, including the Control Group, obtained scores below the 30th percentile on the Tennessee Self-Concept Scale. This supported Polivy & Herman's (1987) findings that extremely low self-esteem is a discriminating characteristic of eating disordered patients and, according to the study sample of the current investigation, of weight preoccupied female students as well. On general psychological well-being the groups were similar on Vigor and Sense of Coherence.

Weight preoccupation was clearly contextualized by demographics. The majority of participants (76.2%) fell within the 20-24 year old category and only 2.38% were younger than 20 years. Although 9.5% were married, almost half (47.6%) of them were not romantically involved.

Seventy-six percent were usually dieting, thus confirming heightened weight awareness. Four percent were constantly dieting and 19% sometimes. Interestingly, each of the subjects had at some stage attempted weight reduction, even though the vast majority (85.7%) only weighed between 50-70 kg, i.e., within their normal weight range. Nobody wanted to weigh

Table 1: Pre-Post Differences within Groups 1 & 2

	Group 1 (N =7)						Group 2 (N =7)					
Variable EDI	M-Pre	M-Post	M-Diff	SD	p	d	M-Pre	M-Post	M-Diff	SD	p	d
D	10.714	6.429	-4.286	3.592	0.032*	1.193¤¤¤	8.429	5.714	-2.714	3.251	0.125	0.835¤¤¤
B	6.571	4.714	-1.857	3.436	0.250	0.540	4.714	2.714	-2.000	1.291	0.031*	1.549¤¤¤
BD	20.000	15.714	-4.286	4.821	0.078	0.889¤¤¤	17.714	11.429	-6.286	3.946	0.015*	1.593¤¤¤
INEF	8.571	5.857	-2.714	3.251	0.093	0.835¤¤¤	5.714	2.857	-2.857	3.625	0.125	0.788¤¤
PERF	7.143	5.143	-2.000	3.266	0.265	0.612	5.714	5.143	-0.571	3.047	0.469	0.187
INT	3.714	2.714	-1.000	3.366	0.750	0.297	2.429	2.143	-0.286	1.380	1.000	0.207
INC	4.857	3.286	-1.571	1.397	0.062	1.125¤¤¤	5.286	3.429	-1.857	2.673	0.250	0.69¤¤¤
M	3.000	2.571	-0.429	1.718	0.687	0.249	3.000	2.857	-0.143	2.795	0.344	0.051
SOC	124.286	127.857	3.571	10.952	0.469	0.326	125.571	131.143	5.571	13.138	0.375	0.424
Variable POMS	M-Pre	M-Post	M-Diff	SD	p	d	M-Pre	M-Post	M-Diff	SD	p	d
T	22.429	17.286	-5.143	2.795	0.015*	1.840¤¤¤	18.857	11.143	-7.714	5.219	0.016*	1.478¤¤¤
D	32.000	28.286	-3.714	8.321	0.328	0.446	20.429	12.286	-8.143	6.492	0.047*	1.355¤¤¤
A	27.429	24.429	-3.000	10.083	0.734	0.298	16.571	12.714	-3.857	9.582	0.234	0.403
V	13.857	15.714	1.857	6.619	0.766	0.281	15.000	17.714	2.714	5.823	0.250	0.466
F	16.286	15.714	-0.571	6.188	0.484	0.092	16.286	10.286	-6.000	3.958	0.031*	1.516¤¤¤¤
CF	15.857	12.714	-3.142	2.911	0.031*	1.079¤¤¤	12.857	8.286	-4.571	1.618	0.016*	2.825¤¤¤
Variable TSCS	M-Pre	M-Post	M-Diff	SD	p	d	M-Pre	M-Post	M-Diff	SD	p	d
PHS	53.714	51.000	-2.714	3.302	0.094	0.822¤¤¤	52.286	52.714	0.429	5.159	1.000	0.083
MES	58.714	60.286	1.571	5.192	0.469	0.303	61.571	61.857	0.286	4.071	1.000	0.070
PS	50.714	52.429	1.714	4.231	0.406	0.405	48.143	51.571	3.429	4.353	0.063	0.788¤¤
FS	50.714	55.714	5.000	8.083	0.063	0.616	54.286	55.571	1.286	3.988	0.531	0.322
SS	51.429	54.714	3.286	8.826	0.625	0.372	50.000	51.286	1.286	2.429	0.219	0.529¤¤
T	265.286	274.143	8.857	20.748	0.313	0.427	266.286	273.000	6.714	17.182	0.734	0.391

M-pre: Mean pre-assessment score; M-post: Mean post-assessment score; M: Mean; SD: Standard deviation; p: Statistical significance: Wilcoxon Signed Rank Test; d: Practical Significance: Wilcoxon Test; EDI: Eating Disorder Inventory; D: Drive for Thinness; B: Bulimia; BD: Body Dissatisfaction; INEF: Ineffectiveness; PERF: Perfectionism; INT: Interpersonal Distrust; INC: Interoceptive Awareness; M: Maturity Fears; SOC: Sense of Coherence Scale. POMS: Profile of Mood States; T: Tension Anxiety; D: Depression; A: Anger; V: Vigor; F: Fatigue; CF: Confusion; TSCS: Tennessee Self-Concept Scale; PHS: Physical Self; MES: Moral-Ethical Self PS: Personal Self; FS: Family Self; SS: Social Self; T: Total.

* $p \leq 0,05$ ** $p \leq 0,01$ *** $p \leq 0,001$

¤ $d \geq 02$ = Small effect ¤¤ $d \geq 0,05$ = Medium effect ¤¤¤ $d \geq 0,8$ = Large effect

Table 2: Pre-Post Differences within the Control Group

Variable	M-Pre	M-Post	M-Diff	SD	p	d
EDI						
D	8.571	8.429	-0.143	3.848	0.625	0.037
B	5.571	7.143	1.571	5.653	1.000	0.278
BD	18.000	18.143	0.143	2.268	0.750	0.063
INEF	7.714	8.714	1.000	2.646	0.406	0.378
PERF	8.000	8.571	0.571	1.618	0.500	0.353
INT	5.571	5.571	0.000	1.291	1.000	0.000
INC	7.000	6.286	-0.714	1.496	0.375	0.477
M	4.429	4.714	0.286	0.488	0.500	0.586
SOC	126.286	124.143	-2.143	8.820	0.813	0.243
POMS						
T	19.000	15.429	-3.571	2.760	0.063	1.249¤¤¤
D	14.429	19.286	4.857	8.552	0.188	0.568¤¤
A	13.143	18.000	4.857	7.175	0.156	0.677¤¤
V	16.429	14.571	-1.857	3.891	0.406	0.477
F	11.143	13.286	2.143	4.140	0.375	0.518¤¤
CF	10.857	10.714	-0.143	3.761	0.781	0.038
TSCS						
PHS	51.857	53.714	1.857	5.080	0.563	0.366
MES	60.143	59.571	-0.571	3.552	1.000	0.161
PS	50.000	49.714	-0.286	1.889	0.844	0.151
FS	53.714	53.429	-0.286	3.946	1.000	0.072
SS	49.571	50.143	0.571	4.541	1.000	0.126
T	265.286	266.571	1.286	14.303	0.563	0.089

M-pre: Mean pre-assessment score; M-post: Mean post-assessment score; M: Mean; SD: Standard deviation; p: Statistical significance: Wilcoxon Signed Rank Test; d: Practical Significance: Wilcoxon Test; EDI: Eating Disorder Inventory; D: Drive for Thinness; B: Bulimia; BD: Body Dissatisfaction; INEF: Ineffectiveness; PERF: Perfectionism; INT: Interpersonal Distrust; INC: Interoceptive Awareness; M: Maturity Fears; SOC: Sense of Coherence Scale; POMS: Profile of Mood States; T: Tension Anxiety; D: Depression; A: Anger; V: Vigor; F Fatigue, CF Confusion, TSCS: Tennessee Self-Concept Scale, PHS: Physical Self, MES: Moral-Ethical Self, PS: Personal Self, FS: Family Self, SS: Social Self; T: Total

* $p \leq 0{,}05$ ** $p \leq 0{,}01$ *** $p \leq 0{,}001$

¤ $d \geq 0{,}2$ = Small effect ¤¤ $d \geq 0{,}5$ = Medium effect ¤¤¤ $d \geq 0{,}8$ = Large effect

more than 60 kg, though 61.9% of them exceeded a weight of 60 kg, indicating overall body and weight dissatisfaction.

In their struggle to reduce weight, the majority (71%) used medication like appetite suppressants or laxatives. Family histories of eating disorders were reported by 23.8%. Thus, in terms of psychometric scores, especially weight preoccupation, and demographics, pre-treatment group equivalence was clearly confirmed across groups.

Pre-post findings in Group 1 and 2

Table 1 provides Pre-Post Differences within Group 1 and 2.

According to Table 1, the Pre-Post findings within Group 1 showed that a large, practical reduction of weight preoccupation occurred, in terms of reduced Drive for Thinness (d=1.193); Body Dissatisfaction (d=0.889) and Ineffectiveness (d=0.835). Enhanced Interoceptive Awareness (d=1.125) was indicative of increased autonomy, i.e., increased internal regulation of behavior and ability to control thoughts – suggestive of enhanced psychological well-being, according to Ryff & Keyes (1995). Negative mood states on the POMS involving Tension/Anxiety (d=1.840) and Confusion (d=1.079) were likewise practically significantly reduced. Physical Self scores on the TSCS were lowered practically significantly (d=0.822). However, no increase was noted in general psychological well-being in terms of Sense of Coherence.

Pre-post differences within Group 2 (Table 1) showed a large practical reduction of weight preoccupation in terms of Drive for Thinness (d=0.835), Bulimia (d=1.549) and Body Dissatisfaction (d=1.593). Tendencies towards reduced Ineffectiveness (d=0.788) and Interoceptive Awareness (d=0.695) also occurred. Negative mood states involving Tension/Anxiety (d=1.478), Depression-Dejection (d=1.355), Fatigue (d=1.516) and Confusion (d=2.825) were likewise practically significantly reduced in Group 2. On the TSCS Physical Self (d=0.788) and Social Self (d=0.529) scores showed tendencies towards improvement. Though general psychological well-being scores showed no change, enhanced interoceptive awareness indicated that well-being was improved in certain respects.

In Table 2 the pre-post differences within Group 3 are depicted. (See "Table 2: Pre-Post Differences within the Control Group".)

According to Table 2, pre-post differences within Group 3 showed a large practical reduc-

tion of Tension/Anxiety (d=1.249). Depression-Dejection (d=0.568), Anger-Hostility (d=0.677) and Fatigue (d=0.518) tended towards an increase. No indication of enhanced general psychological well-being occurred.

Pre-post differences between the three groups showed that changes within groups were also confirmed by changes between groups. The large practical reduction of Body Dissatisfaction (d=1.754), Depression-Dejection (d=1.213) and Confusion (d=0.837) in Group 2 exceeded that of Group 3 (Control group). The reduction of Ineffectiveness (d=0.893) and Perfectionism (d=1.249) in Group 1 exceeded that of Group 3 (control group).

DISCUSSION

The results of the study provided psychometric support for the hypothesis that participation in a combined Tomatis and PEP would result in reduced weight preoccupation and negative mood states in weight preoccupied female students. Partial enhancement of psychological well-being also occurred in Group 1 and 2. However, the results of the combined program were not significantly better than the results of the PEP. Though the two outcomes were highly comparable, notable program-specific findings also occurred.

Outcome of the combined Tomatis and Psycho-educational program in Group 1

Results of the combined program confirmed an advantage over the PEP-only Group, except for Depression-Dejection and Fatigue. Practically significant changes, over and above significantly reduced weight preoccupation, also occurred in Ineffectiveness and Interoceptive Awareness, indicative of partially enhanced psychological well-being. The latter result might be specifically associated with the TM. The resultant "rewiring of the brain" based on neurological connections between ears, brain stem and brain, stimulated during the process, is also associated with body image improvement. Improved Interoceptive Awareness is a further result, possibly also suggesting heightened awareness of inner dialogue. Similarly, the significant improvement of Physical Self on the TSCS, can be attributed to favorable body image changes.

Reduction of Tension-Anxiety on the POMS perhaps reflected the relaxation effect of the TM, is consistent with previous findings concerning the reduction of anxiety by means of the TM (Akakios, 2002). The significant reduction of Confusion (POMS) reflected the cognitive stimulation effect, which further prepared the participants for the PEP.

While a more favorable outcome was expected of this program, its optimal potential could not be tapped, due to unforeseen constraints. Conducted during spring, it was anticipated that prospective weight preoccupied participants, eager to swim and tan, but inhibited because of their body dissatisfaction, would respond favorably to the program, in view of approaching vacations possibly to be enjoyed at beach resorts. A good initial response from prospective participants was obtained. At the onset of the listening sessions, participants were warned against expecting sound stimulation to be a "quick fix" for weight preoccupation, but rather to see it as a means of relaxation and enhancing their openness in preparation for the psycho-educational component. However, despite the researcher spending time daily with each individual during the listening sessions, the participants were increasingly reluctant to attend the PEP, claiming the approaching year-end examinations to be the problem. To ensure completion of the combined program, Tomatis listening sessions were reduced to 40 instead of a minimum of 60 half-hours. Despite attempting to accommodate participants in this way, attendance of the PEP, following completion of the abbreviated Tomatis stimulation, was unsatisfactory. Three participants missed half of the sessions. It was assumed that despite sufficient warning, the participants willingness to complete the combined program declined because the desired outcome was not yet perceived during the TM. Possibly fear of academic failure was also involved.

The strength of the TM is that sound stimulation prepares the ground for individual consultation. Due to its energizing, relaxing and communication enhancing impact, it facilitates openness to engage in a therapeutic journey through the problem to be dealt with. Given the "recalcitrance" of eating disorders like bulimia and anorexia (Bellack & Hersen, 1990) and, possibly of weight preoccupation too, each participant's specific

context, personal strengths, and weaknesses around weight preoccupation ought to have been clarified, as a prerequisite for overcoming weight preoccupation and stimulating psychological well-being with assistance from the researcher.

Unfortunately, given the time constraints, these unique strengths were underutilized and although participants enjoyed increased relaxation, they were not focused on personalized goals related to weight preoccupation from the onset of the listening component of the combined program. Thus, valuable opportunities to commit themselves to their individual struggle with weight preoccupation were lost. Underutilization of participants' conscious commitment possibly explains why change was limited to reduced weight preoccupation, Tension/Anxiety, Confusion, Ineffectiveness, and improved Interoceptive Awareness.

The necessity of individualized, structured consultation with each participant, informed by pre-assessment findings, as a means of preparation for the PEP and optimizing the total impact, thus emerged as mandatory for further research.

Outcome of the Psycho-educational Program in Group 2

Overall, the program proved surprisingly successful, in view of its much briefer duration of four 90-minute meetings. Besides significant reductions in Drive for Thinness and Body Dissatisfaction, it also led to significantly reduced bulimia, indicative of improved self-esteem and behavior, which according to Ryff and Keyes (1995) also represents a dimension of psychological well-being. The latter possibly resulted from insights gained during group meetings. The tendency towards reduced Ineffectiveness and Interoceptive Awareness might likewise be a result of expanded awareness. Significantly less negative affect, i.e., significantly lowered Tension/Anxiety, Depression-Dejection, Fatigue and Confusion also occurred. On the TSCS, Personal Self and Social Self tended towards improvement. Thus, the opportunity afforded by the PEP to obtain information relevant to weight preoccupation and explore new aspects of themselves in an informal context of acceptance by researcher and co-participants, resulted in reduced weight preoccupation and emergent new self-perceptions. An interesting explanation arose from a Transactional Analytic perspective. Assuming that immediate gratification was represented by bulimic tendencies towards bingeing, and Body Dissatisfaction and Drive for Thinness were associated with a Critical Parent ego state, the results implied that participants' rebellious child ego states were put to rest, as their Adult ego states started taking control (via cognitive restructuring of irrational thoughts), and enhancement of autonomy in order to resist social pressures.

The specific strength of the PEP was its awareness raising thrust, based on clarifying the media onslaught and experiential integration of cognitive-behavioral, narrative therapeutic, and TA concepts, challenging participants to take control. Its presentation to Group 2 was possibly even more effective as the researcher/therapist reported feeling more at ease than during presenting it to Group 1, since Group 2 participants attended regularly and participated more spontaneously.

Partial enhancement of psychological well-being

Previous evaluations of the TM with clinical (Coetzee, 2001) and non-clinical groups (Du Plessis, Burger, Munro, Wissing & Nel, 2001), indicated that reduction of pathology or negative affect, concurred with enhancement of psychological well-being. Thus, partial enhancement of general psychological well-being, despite reductions in weight preoccupation and negative affect in the current study, suggested the presence of underlying problems not adequately confronted by the programs. Although both Group 1 and 2 responded somewhat in terms of self-concept, (Group 1 by significantly enhanced Physical Self and Group 2 by tendencies towards improved Personal and Social Self), general psychological well-being would probably only be enhanced significantly if the negative self-perceptions underlying poor self-concepts could be confronted more intensely by cognitive methods.

CONCLUSIONS

Conceptualized in the literature as a condition comprising Drive for Thinness and Body Dissatisfaction, weight preoccupation is clearly distinguishable from full-blown eating disorders. The viability of both the com-

bined Tomatis and PEP, as well as the PEP-only program, was proved, as both rendered successful outcomes in terms of symptomatic reduction and highlighted program specific strengths needing to be apportioned appropriately in further research.

Although encouraging, the results of this pilot study also revealed the following design limitations: (i). The high scores on weight preoccupation, especially in Group 1, and low self-concept scores suggested that weight preoccupation more closely represented eating disorders not further specified. Thus, the absence of Body Mass Index (BMI) is a distinct limitation, as it would have clarified participants' status as being over- or underweight. (ii). The condensed PEP had almost the same impact as the combined TM and PEP, although in the latter case the Tomatis program had to be reduced and attendance of the PEP was unsatisfactory. (iii). Partial enhancement of psychological well-being across Groups 1 and 2 was probably related to participants' very low self-esteem, which was not addressed adequately, given the time constraints. (iv). Both programs suffered from brevity, given the high risk of losing participants of the combined program in the face of approaching year-end examinations. (v). The lack of a multicultural group and absence of follow-up investigation were limiting too, and psychological well-being was not measured optimally.

Recommendations for further research include the following: (i) replicating current findings with larger, multicultural samples, embedded in first term, based on a more extensive program, and prominently dealing with self-concept enhancement; (ii) follow-up assessment to determine retention effects; and (iii) evaluating the impact of a restructured, combined program with mild to moderately overweight students.

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The Role of Auditory Control in the Articulation Process

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ABSTRACT

In the etiology of articulation disorders, the most frequently mentioned auditory perception disorders include impairments of the receptive (hearing) function and disorders of speech sound discrimination (disorders of phonemic hearing). One should not, however, disregard the disorders of other auditory functions that can affect the process of articulation. It is therefore interesting to examine auditory attention (selection and intensification of sound stimuli processing) in patients with dyslalia and try to determine its impact on the perception of speech sounds: exogenous and one's own. No less significant is the assessment of the ability to discriminate sound pitches and the evaluation of auditory lateralization in children with articulation disorders. The authors seek to present this problem on the basis of empirical studies covering a group of ninety-four Polish children aged five to fourteen years.

RESUME

Le Rôle du Contrôle Auditif dans le Processus d'Articulation

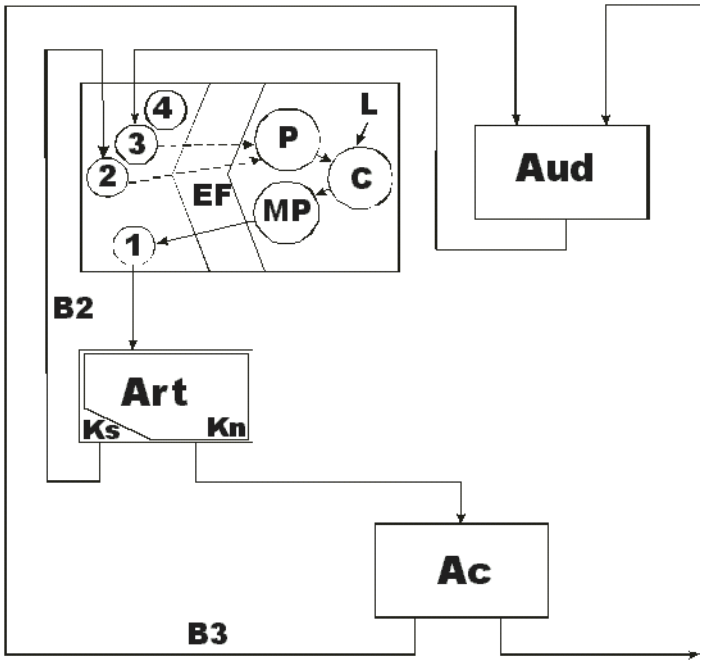
Dans l'étiologie des troubles articulatoires, le plus fréquemment cité parmi les désordres de perception auditive incluent des troubles de la fonction réceptive (audition) et les troubles de la discrimination sonore (troubles de l'audition phonémique). Cependant on ne devrait pas ignorer les troubles d'autres fonctions auditives qui peuvent affecter le processus de l'articulation. Il est par conséquent intéressant d'examiner l'attention auditive (la sélectivité et l'intensification de l'intégration de stimuli sonores) chez les malades souffrant de dyslalie et d'essayer de déterminer son impact sur la perception de sons émis lors de l'expression langagière : dans le cas de situation à la fois exogène et propre au sujet lui même. Non moins significative est l'évaluation de la capacité à discriminer des hauteurs de sons et l'évaluation de la latéralisation auditive chez les enfants présentant des désordres articulatoires. Les auteurs cherchent à présenter ce problème en se basant sur les études empiriques couvrant un groupe de 94 enfants polonais âgés de 5 à 14 ans.

ZUSAMMENFASSUNG

Die Rolle des Gehörs bei der Artikulation

In der Etiologie von Artikulationsstörungen umfassen die am öftesten festgestellten auditiven Wahrnehmungsstörungen Beeinträchtigungen der Empfangsfunktion (des Hörens) und Störungen der Sprachgeräuschunterscheidung (Behinderungen des phonemischen Hörens). Man sollte aber nicht Störungen anderer Gehörfunktionen übersehen, die die Artikulation beeinflussen können. Es ist daher interessant, die Gehöraufmerksamkeit (Auswahl und Intensivierung der Verarbeitung der auditiven Stimulation) bei Patienten mit Dyslalie zu untersuchen und seine Auswirkung auf die Wahrnehmung der Sprachlaute festzustellen: exogene und die eigenen. Nicht weniger signifikant ist die Feststellung der Unterscheidungsfähigkeit der Tonhöhen und der Lateralisation des Gehörs bei Kindern mit Artikulationsstörungen. Die Autoren versuchen, dieses Problem anhand

Figure 1: L. Kaczmarek's speech model



Aud	Auditory Analyzer	L	Language
1	Motor Centers	MP	Motor Programming
2	Kinesthetic Centers	Art.	Articulation
3	Auditory Centers	Ks	Kinesthesis
4	Visual Centers	Kn	Kinesis
EF	Emotional Filter	Ac	Acoustic Signal
P	Perception	B2	Kinesthetic Control
C	Cerebration	B3	Auditory Control

empirischer Studien mit einer Gruppe von 94 polnischer Kindern im Alter von 5 - 14 Jahren darzustellen.

RESUMEN

El Rol del Control Auditivo en el Proceso de articulación.

En la etiología de los desordenes de articulación, los desordenes de percepción auditiva mas frecuentemente discutidos incluyen trastornos de la función receptiva (audición) y desordenes de discriminación de sonidos de lenguaje (desordenes de audición fonemica). Uno no debe, por tanto, descartar los desordenes de otras funciones auditivas que pueden afectar el proceso de articulación. Es entonces interesante, examinar la atención auditiva (selección e intensificación de procesamiento de estímulos de sonido) en pacientes con dislalia, y tratar de determinar su impacto en la percepción de sonidos de lenguaje, los propios y los externos. No menos significativa es la evaluación de la habilidad para discriminar tonos y la evaluación de lateralización auditiva en niños con trastornos de articulación. Los autores buscan presentar este problema en base a los estudios empíricos que cubran un grupo de noventa y cuatro niños polacos entre los 5 y los 14 anos.

INTRODUCTION

In terms of auditory perception, the articulation process depends on two factors: the acquisition of auditory patterns in the process of exogenous utterances perception as well as the auditory control of articulation. The theory of logopedics, and particularly its practice, studies the ability to perceive exogenous utterances, i.e. those external to an individual. A number of studies examine the articulation disorders generated by limited sound perception (Styczek 1978, Emiluta-Rozya 1994, Krakowiak 1995, Kurkowski 1996), or describe articulation in cases of phonematic, or phonemo-phonetic, hearing disorders (Styczek 1982, Kania 1982, Roclawski 2001).

The present article does not aim at discussing the ambiguities in terminology and approaches referring to the process of exogenous utterance perception. The authors wish to focus on the question of one's own utterance perception as an integral part of the articulation process. It seems noteworthy to recall L. Kaczmarek's speech model representing the point of auditory control in the speech process. Also, the definition of speech hearing as "the ability to discriminate and identify the elements phonologically relevant and to reject those redundant in exogenous as well as one's own utterances" indicates the distinction between the two phenomena: exogenous utterance perception (phone-

matic hearing) versus one's own utterance perception (phonetic hearing) (L. Kaczmarek 1982, p. 280). A similar approach has been represented before by authors such as Van Riper (1970) and Lewina (1968) (after: Kania, 1982).

Lewina distinguishes five stages of development of phonematic hearing. At the third stage in the kindergarten period, the child becomes aware of the difference between correct and incorrect speech.

In Van Riper's opinion, the child is not aware of his/her own incorrect speech. The child knows that his/her speech is faulty but cannot name the problem nor cannot point out the incorrect sounds present in his/her speech.

Jelinkova examined 80 children with dyslalia, distinguishing six groups based on each child's sound perception abilities. In one of the groups, the children did not recognize mistakes in their own speech, but they were aware of faulty speech in other persons (after: Kania 1982)

Kaczmarek's speech model, presented in Figure 1, emphasizes the importance of auditory control in speech production. In Kaczmarek's model the auditory input is single-channel (i.e., with no difference made between information provided by right and left ear). An acoustic speech signal in this model is delivered by air conduction.

The logopedic practice seems to disregard the above approach. Speech therapists often encounter major difficulties in speech correction exercises on provoked sounds, which are not associated with the impaired motor performance of the speech organs. The results of the authors' study may explain the above problem.

MATERIAL AND METHODS

The study group had ninety-four dyslalic children aged seven to ten years, who presented substitutions, deformations, and ambiguous articulation of mainly front alveolar and front dental sounds.

The motor performance of the speech organs in terms of vertical and horizontal tongue movements, which are crucial for the articulation of the Polish language sounds, was incorrect in forty-two of the examined (44.7%). Twenty-three individuals displayed impaired vertical movements of the tongue front, which determine the realization of front alveolar sounds. In the remaining nineteen children a reduced precision and speed of tongue movements was observed. The malocclusion of teeth was diagnosed in three children, and shortening of the frenum (tongue-tie, ankyloglossia) in another three.

Phonemic hearing, i.e. the ability to discriminate phonemic structures, was evaluated by means of J. Kostrzewski's Scale of Auditory Perception of Words. Only four children (4.3%) achieved the results below the average, whereas twenty-one children had slight difficulties discriminating nonsense words. Phonemic hearing evaluation by Roclawski method was negative only in one child.

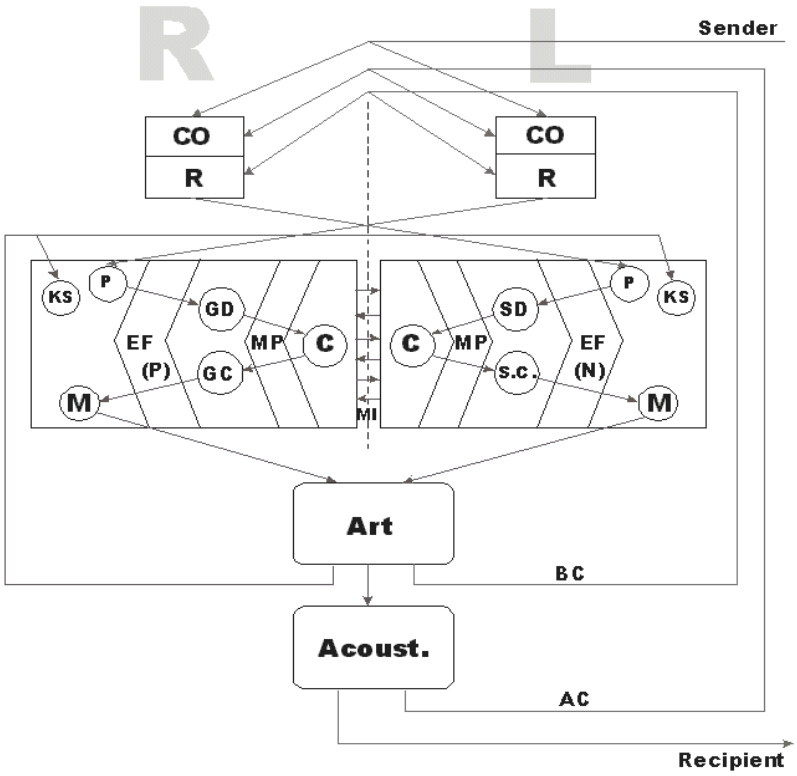
Classical methods of logopedics do not allow clear determination of the causes of retarded or disrupted development of articulation in younger schoolchildren.

A high percentage of children with positively evaluated phonemic-phonetic hearing may lead to the false conclusion that articulation difficulties are not determined by the lowered auditory perceptive performance. This is proved by the fact that no motor factors possibly responsible for articulation problems have been identified in some children (in the studied group there were about 51% of children without motor difficulties or phonemic hearing disorders).

The widely employed techniques of phonemic, phonetic and prosodic (i.e. speech sound discrimination) hearing evaluation assess only the ability of exogenous sounds perception, i.e. the sounds reaching a child from the outside. They do not evaluate, however, the ability to control one's own articulation. This ability develops later than exogenous sounds perception and it is determined by both air and bone conduction perception. Everyone perceives his or her own speech recorded on an audiotape or videotape as somebody else's (exogenous) speech because listening to one's own voice through bone conduction impacts perception of one's own speech.

In this respect, the Tomatis Method has contributed significant progress toward diagnosis. The Tomatis Method seems, therefore, indispensable in diagnosing individuals with articulation disorders in order to account for problems of asynchronicity between the air and bone conduction perception, disorders of sound pitch discrimination, and

Figure 2. Audiophonological speech model



R	Right Side	SC	Sequential Coding
L	Left Side	MP	Motor Programming
Co	Conduction (Middle Ear)	EF(P)	Emotional Filter (Positive Emotions)
R	Reception (Inner Ear)	EF(N)	Emotional Filter (Negative Emotions)
P	Perception	M	Motorics
GD	Global Decoding	Ks	Kinesthesis
SD	Sequential Decoding	Art	Articulation
C	Cerebral Processing	BC	Bone Conduction
GC	Global Coding	AC	Air Conduction

dysfunction of auditory lateralization.

The diagnostics involved using the Tomatis Listening Test, which included assessment of external perception of sounds (by air conduction) and internal perception of sounds (by bone conduction), is directly connected to the ability to assess one's own speech. Sound discrimination was assessed with the "sound selection test," which required the tested subject to differentiate sounds in half octave steps. Laterality of one's dominant ear used for speech control was assessed using the Tomatis Audiolaterometer.

In studying auditory perception in the group of ninety-four children with dyslalia, incorrect auditory attention (listening ability) was diagnosed in eighty-eight of those examined, more often in the left ear. Incorrect internal control within the speech band was mostly identified in left ear perception, with increased errors in 43.8% of those studied and fewer in 30.9% of cases. Unstable internal and external auditory attention in speech band (47.8%) or lowered internal attention (39.1%) was more often identified in right-ear perception, as determined by the Tomatis Listening Test.

Further results obtained in the Tomatis Listening Test were identification of disorders of sound pitch discrimination in speech band, which were displayed by 82.9% of the examined, and by as many as 98.9% of cases above 2000 Hz

These frequencies, therefore, seem crucial to front alveolar and front dental sounds.

70.2% of the examined displayed left-ear or ambiguous lateralization. Four individuals were diagnosed as left-handed (4.3%) and two as ambidextrous (2.1%). Two left-handed children had been 'switched' to right-handedness, i.e. there was no integration of activities within one hemisphere, as determined by Tomatis's auditory laterality test and Zazzo's tests of handedness [Zazzo, 1960].

DISCUSSION

The process of articulating speech sounds is influenced by phonemic and phonetic hearing of exogenous utterances (external phonemic and phonetic hearing) as well as phonemic and phonetic hearing of one's own utterances (internal phonemic and phonetic hearing). The typical methods employed thus far of phonemic hearing evaluation (Roclawski 2001, Styczek 1976) and tests of auditory perception (Kostrzewski, 1976) allow the assessment of external phonemic hearing exclusively. No tools exist

for the evaluation of internal phonemic and phonetic hearing.

Tomatis' diagnosis of auditory attention may indicate lowered auditory attention in speech band as the root cause of phonemic perception disorders.

Correct sound pitch discrimination plays an important role in the development of the articulation process. The process of hearing is known to be related to the development of the auditory analyzer, whereas the process of listening is formed gradually and consists mainly in the acquisition of the ability to discriminate sound pitches. This process is very often impeded, and difficulties in discriminating particular sound pitches arise. Problems with frequency discrimination in speech band have a considerable impact on the articulation process.

The dominance of the left hemisphere and, in consequence, right-side lateralization is crucial to control of the speech process. Ambiguous lateralization (mainly auditory) or cross-lateralization may affect the process of speech perception and expression.

For the purposes of logopedics, Kaczmarek's speech model may be modified as shown in Figure 2.

The main differences between Kaczmarek's Speech Model and the Audiophonological Speech Model are the designation of two-channel (left and right ear) input of speech and of auditory speech control by air and bone conduction, which is independent of perception of external stimuli.

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Pronunciation and the Adult Learner: Limitations and Possibilities, ed. Ulrike A. Kaunzner

Pronunciation and the Adult Learner: Limitations and Possibilities, ed. Ulrike A. Kaunzner
CLUEB (Bologna, Italy) 2000.
203 pages. 16.53 Euro, paper.

Reviewed by Elizabeth Joiner, Ph.D., RCTC and Craig Callender, University of South Carolina

Since 1990, the European Union has promoted the languages of member nations by funding student exchanges and other language-related projects through its Lingua-Socrates program. One such project, called Audio-Lingua, was designed to test the Tomatis Method applied to language learning. The results of the experimental study, reported for the first time in 1997 at a conference on pronunciation and the adult learner, constitute the first of the ten articles that make up this volume. The volume also includes an introduction and a listing of biographical entries of the contributors.

The adult learner as defined here is anyone attempting to learn a foreign language beyond the so-called critical period, after which achieving native-like pronunciation is quite rare. The title is somewhat misleading, however, because the articles go beyond mere sound production to treat the entirety of oral communication including sound perception, listening comprehension, and oral expression. Most of the contributors are associated with European universities and represent areas such as language, linguistics, or speech communication. A few, however, are connected to institutions in the private sector. The latter include specialists in voice training, hearing, language training for businesses, and educational measurement. In the spirit of the Lingua-Socrates program, the articles are written in several European languages (English, German, Italian and Spanish), each preceded by an English-language abstract.

The first three articles of the collection are directly related to the Audio-Lingua Project, which had two goals: (1) to test the effectiveness of acoustical stimulation in developing receptive competence and oral expression and (2) to develop didactic materials in the languages involved. The three articles complement and support each other nicely. The first is a detailed account (46 pages in English) of the experimental study which compared language training with the Sound Perception Trainer (a version of the Electronic Ear) to training with conventional language laboratory methods and found in favor of the Tomatis Method. In it, de Jong and Kaunzner (also the editor of this volume) support their findings with extensive charts, graphs, and tables. While the introductory remarks of the lead article deal with models of language proficiency, principles of language learning, and the basic assumptions underlying sound perception training, it is Gianni, writing in Italian, who provides the most complete account of the theoretical basis for using sensory stimulation to enhance foreign language acquisition. Further, he presents an excellent description of the Sound Perception Trainer and its functioning. In the third article of the trilogy, Beheydt deals with the Dutch pronunciation course that was developed as part of the Audio-Lingua Project. Writing in English, he discusses criteria used for the selection of a pronunciation norm and presents the basic tenets of the course, one of which is that accurate pronunciation is based upon preliminary accurate perception.

The other articles in the volume, while not directly related to the Audio-Lingua Project, are linked to it conceptually in that they are all related to sound perception and the primordial role of sound in language learning. Prosody (intonation, rhythm, etc.) is a prominent theme in articles by

Missaglia (in German), Pearce (in English), and Fernández García (in Spanish). Missaglia, who argues that language students should be treated as bilinguals from the beginning of instruction, presents a model for early training in prosody using the native language as a starting point. Pearce's article, though somewhat theoretical in that it cites recent research in anthropology and psychology to highlight the most salient points of commonality between music and language, nevertheless shows how these can be applied in the classroom through poetry, dance, and drama. Fernández García, too, chooses poetry as an important instructional tool in the service of prosodic phonology. Drawing on the literature of neurolinguistics, she argues for the necessary involvement of both brain hemispheres in the work of professional interpreter.

The premise of strengthening language networks connecting the two hemispheres underlies the functioning of a machine developed by Warnke and described by him in an article written in German. Unlike the two channels of the Electronic Ear, the channels of Warnke's machine (one channel with a model voice, the other with the student's voice) change at regular intervals. Technology also plays a role in Stolze's article (in German) on tonal consciousness training for choir singers, a practice which he believes could be useful for second language learning. This training focuses on partials, or overtones, and is accomplished by means of a computer.

While most of the articles, apart from the lead article, are not research-oriented, Sendlemeier's contribution (in German) to the volume describes several informal experiments. These studies, which he conducted to test prototype theory with respect to phonological acquisition, lead him to conclude that the prototype functions as a perceptual magnet, i.e., sounds similar to the prototype are perceived as the prototype and that learners benefit from broad variation of input regarding speaker and phonological context. He also connects speaking difficulty to problems in the area of listening.

Sound perception is the theme of the book's final article, written in German by Rauen, who reflects on the words used to designate acoustic events in German and Italian and speculates that native speakers of the two languages perceive sounds differently. She hypothesizes that language may affect perception by acting as a sort of filter among ear, sound, and mind.

This collection of articles is somewhat uneven, varying as it does from the impressive lead article, which is highly quantitative, to the reflective meditation that closes the volume. Most of the articles present theory-based practices and approaches, few of which are supported by evidence other than the author's own observations and experiences. Some readers will wish for more quantifiable data. It is unfortunate, too, that the collection was published three years after the conference at which the articles were presented. Further, the book would have benefited from more careful proofreading. The most flagrant of a number of typographical errors is the mention of the fetus at twenty-four months! The lack of an index is somewhat frustrating as well, although this would have been difficult to establish in a multilingual publication. Indeed, the presentation of articles in several European languages makes the book challenging to all but polyglots.

On the positive side, organizing a conference, and the resulting publication, around the theme of pronunciation and the adult learner was a timely idea in this age of global communication. The editor of the volume is to be congratulated on this initiative. The varied approaches, technologies, and theory presented here make for thought-provoking reading, and the publication delay, while regrettable, allowed some of the authors to update their contributions by incorporating references to works published after 1997. Because its scope includes sound perception as well as the spoken and sung voice, this book is of interest not only to teachers of second and foreign languages but to all professionals who deal with sound perception and production. It is worth purchasing even if one reads only the lead article, which lends strong support to the use of the Tomatis Method to enhance and facilitate language learning.

Reviews of Japanese Language Books

Kuniko Murase, RCTC

A series of books published in the Japanese language has stimulated a great deal of interest in Japan, especially in the use of the Tomatis Method for the application of learning foreign languages:

Takizawa, T. & Oiwa, M. (2000), Theory and practice of audio-psycho phonology. City: Surugadai Syppansya, 173 pp.

This book was published with the state subsidy for scientific researches from the Japanese government in 1999. In spite of recent innovations in the foreign language teaching field, such as Language Laboratory equipment, the recruitment of native speakers to teach a language so that the students hear the correct intonation, sounds, and rhythm of the language in their first learning experience has made it difficult to get effective results until the introduction of the Tomatis Method in Japan. This has been partly due to the fact that not enough emphasis has been put on learners listening problems as well as on the correlation found in the mechanism of listening and speaking. However, the audio-psycho-phonology theory of Dr. Alfred A. Tomatis has helped us to overcome this problem, and this book describes the benefits of the Electronic Ear used with Japanese subjects.

Murase, K. (1996). The most efficient method for learning foreign languages. City: Nihon Jtsugyou Syuppansya, 230 pp.

The author provides an account of how she set out to work with the Tomatis Method. Many references are made in the form of anecdotes about Dr. Tomatis. The book describes the difficulty Japanese learners experience when learning English and gives an insight of the listening differences that learners from various ethnic groups may experience. Just as Dr. Tomatis did, the author highlights the importance of the ear mechanism.

The secret to acquiring a native-like ability to speak a foreign language is to first acquire a native ear. For Japanese learners to acquire a foreign language, they must acquire the ear of the native speaker of that language by going through the same listening acquisition phases for the new language that they did for their mother tongue. The Electronic Ear created by Dr. Tomatis accelerates the rate at which this can be done for foreign languages. This book presents the Tomatis Method and its benefits for learning language in a very comprehensive way. To have a good ear is foremost to have a sane and stressless nervous system, as well as the correct listening posture to best allow sound energy to stimulate the brain.

Sasabe, T. (2002). Enjoyable preparation for birth with music. City: Clinic obstetrics gynecology 210 pp.

Dr. Sasabe is an obstetrician who devoted his long career to finding and developing the easiest birth techniques for both mother and child. He introduced the Tomatis Method for pregnant mothers as suggested by Alfred Tomatis and provided it to seven pregnant women at his hospital, with the support and assistance of Tomatis Japan. This book contains surveys of these mothers talking about the positive results of their listening sessions. Analyses that were carried-out in relation with the Tomatis Listening Test showed improvement in several areas:

- Balance
- Relaxation
- Communication
- Expression
- Energy level (tiredness)

- Creativity
- Attitude

The mothers' comments indicated the following observations about this program:

- Improved physical and mental relaxation
- A sense of self-confidence and trust to become a mother thanks to communication with the fetus
- No worries about the birth process
- Pleasure and satisfaction in taking care of the child
- The baby's stability and communication with the mother.

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