A review of the Original Combination Technique and Philosophy

By Dennis J. Tartakow, DMD, MEd, Edd, PhD, Editor in Chief

During the 1960s, when the Begg lightwire and the Tweed edgewise were the mainstream techniques of orthodontic therapy, Dr. Maxwell Fogel and Dr. Jack Magill introduced their "Combination Technique" (Fogel & Magill, 1969).

The Combination Technique’s philosophy was based on combining the positive and significant attributes of Begg lightwire and Tweed edgewise techniques to produce a system that corrected malocclusions quickly and easily for the orthodontist, with much less pain and a shorter period of time for the patient, while producing American Board of Orthodontics quality, standards and results.

Outline of the Combination Technique

Stage I: Light-wire phase (Tipping)
1. Reduce protrusion
2. Un-crowd incisors
3. Open the bite (restore vertical dimension)
4. Class I molars and cuspid
5. Begin closing extraction spaces
6. Upright mandibular incisors

Fig. 1a
Fig. 1b
Fig. 1c
Fig. 2a
Fig. 2b
Fig. 2c
Fig. 3a
Fig. 3b
Fig. 3c

Photos/From Fogel and Magill’s “The Combination Technique in Orthodontic Practice.”

Sobler Orthodontics:
Father-son team serves N.Y.

By Sierra Rendon, Managing Editor

Father-son duo Dr. Terry Sobler and his son, Dr. Ian Sobler, together make up Sobler Orthodontics, which has been providing family-friendly orthodontics in New York for more than 35 years. "We’ve been doing it together for five years," Dr. Ian Sobler said. “We work well together, and I learn a lot from him.”

Dr. Terry Sobler has been practicing for more than 40 years. Despite — or because of — these four decades, the So-
What is pragmatic research?

By Dennis J. Tartakow, DMD, MD, EdD, PhD, Editor-in-Chief

As my last two editorials concentrated on research, it would be fitting to present another research matter known as pragmatic research, which is certainly not new but essential and practical to life and research. A research problem must be examined through various social science theories in order to structure the interpretive lens of the post-modern perspective for classification of those factors that serve all individuals, including disadvantaged and excluded individuals of different races, cultures and genders. The focus of this dialogue deals with changing ways of thinking, rather than expecting action-based outcomes. It was, however, doubtful that any one social science theory or methodology, the important aspects regarding how pragmatism creates the design of a proposed research study; these features:

1. are not dedicated to any one philosophical system of reality.
2. provide researchers the freedom to choose the methods, techniques, and procedures of research that best meet his or her needs and purposes.
3. do not see the world as an absolute unity, or only one way, rather the pragmatist views research as mixed methods researchers, who view many approaches to collecting and analyzing data – both qualitatively or quantitatively.
4. allow for truth to be reported as what works at the time rather than as a duel between reality that is independent of the mind or reality that is within the mind.
5. permit the researcher to discover “what” and “how” rather than to research based upon intended consequences.
6. suggest that research occurs in social, historical, political, or other context.

We will therefore address the grounded theories that draw upon researchers studying turning points of problematic situations in which transitional periods occur. Confrontation of centrality regarding media-created realities are also addressed and sometimes further advanced through informational technology, such as the Internet.

**Research**

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**Image courtesy of Dr. Earl Broker.**

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Stage II: Bracket alignment phase (Leveling)
1. Level and align maxillary and mandibular arches
2. Closure of extraction spaces
3. Preliminary uprighting of cuspids and bicuspids
4. Preliminary correction of rotations
5. Preliminary correction of axial positions

Stage III: Edgewise phase (Uprighting)
1. Detailed axial positioning of all teeth
2. Lingual root torque for labial axial inclination of the maxillary incisors
3. Root paralleling in extraction areas
4. Desired uprighting of molars
5. Artistic positioning of incisor segments
6. Complete correction of rotations
7. Residual space closure

Retention
Two years — indefinite

Overview of the Combination Technique philosophy

The Combination Technique incorporated three stages of appliance therapy:

Stage I
The initial stage was called the light-wire or tipping phase, employing 0.014, 0.016 and 0.018 round wires, which required approximately four to eight months to achieve desired results. This first phase employed Dr. Raymond Begg’s concept of light, continuous forces to uncrowd anterior teeth, open the bite (restore vertical dimension), reduce the protrusion, begin closing extraction spaces and uprighting mandibular incisors, all without straining the posterior anchorage unit.

The Begg philosophy and mechanotherapy produced light, physiologic forces through the use of one-point contact, free-sliding, non-binding and continuously moving teeth that were connected to the archwire (Begg, 1961). Fogel and Magill created this appliance by uniting the light-wire vertical insert pin (Fig. 1a) with the widely spaced twin edgewise bracket (Fig. 2b) into a single appliance unit (Fig. 1c).

The joining together of these two attachments enabled the development of a system for controlled light-wire therapy in the first stage of the Combination Technique. (All figures are from Fogel and Magill’s “The Combination Technique in Orthodontic Practice”)

During Stage I (light-wire and tipping), a single light archwire with multiple loops and hooks was snapped into the vertical insert pins to produce simple tipping of the incisors, placing them in harmony with and upright over the apical base (Figs. 2a, 2b). This included correction of overjet, overbite and jaw relationships by means of controlled anchorage through the use of differential inter- and intra-arch elastic forces.

Stage II
The second stage was called the leveling phase, employing a multi-stranded Cephalometric X-ray to check uprighting of the mandibular incisors
Treatment of a Class II, Division I severe malocclusion

Example of the Combination Technique in a severe malocclusion

Torquing auxiliary

During the correction of many severe malocclusions, the maxillary incisors required root torque as a result of lingual crown tipping. In order to accomplish this, incisor root torquing, an auxiliary wire was employed similar to that used by Begh during Stage III. The auxiliary (Fig. 5) was an 0.014 wire constructed of two loops in the same plane as the archwire, which when snapped into the insert pins placed the loops onto the maxillary central incisors slightly subgingivally. After snapping the torquing auxiliary into the insert pins anteriorly (Fig. 6), it was cinched behind the molar tubes posteriorly.

This torquing auxiliary was used in addition to the main edgewise wire, which had been ligated into the horizontal slot of the widely spaced twin edgewise bracket to carry out the desired objectives of Stage III as well as providing anchorage and stability during the torquing procedure. The torquing auxiliary forces produced approximately one degree of lingual root movement per month. This was substantiated by cephalometric and visual examination.

Combination Technique mechanics

Stage I — Single strand light-wire stage (Figs. 9a–9c)

The objectives of Stage I were to achieve: (a) root paralleling of teeth adjacent to the extraction areas, (b) uprighting of molar teeth, (c) artistic positioning of the incisor segments, (d) continued overbite correction if necessary, (e) final closing of residual extraction spaces, and (f) lingual root torque for labial axial inclination of the maxillary incisors.

Stage II — Edgewise stage (Figs. 10a–10c)

The objectives of Stage II were to achieve: (a) stable anchorage for Class II elastics, (b) correct axial inclinations, (c) root paralleling in extraction areas, (d) uprighting of the molars and bicuspids, (e) ideal arch form, (f) continued overbite correction and (f) final closure of residual spaces.

Summary

Historically, Dr. Maxwell Fogel and Dr. Jack Magill believed that the unification of the Begg light-wire and the Tweed philosophies produced an ideal milieu for (a) universal action and controlled tooth movement in all directions, (b) automatic, self-acting appliances, with a long span of action, a few adjustment periods, and (c) simple, uniform design, painless and compatible with the tissues surrounding the teeth. According to Fogel and Magill (1972), anchorage was the focal point in successful treatment; gentle, free tipping movements of the canines in a distal direction into the extraction spaces imposed less stress on the anchor units than did bodily distal of the solidity em-bedded teeth. For many years, tipping movements for anchorage preservation was looked upon with great skepticism. The widely spaced twin edgewise bracket, as suggested by Dr. Brainerd Swain in 1949, was used to solve the problem of paralleling roots when closing extraction spaces. As Dr. Cecil Stein er succinctly stated: "A single arch wire of uniform standard design and size cannot serve with equal efficiency for the various purposes necessary" (Fogel & Magill 1972). It follows that different types of appliance units require appropriate construction and design so that a variety of wire sizes may be used for proficient and controlled performances effecting an assortment of significant assignments.

Fogel and Magill combined the twin edgewise bracket with a vertically placed insert pin to produce a natural union as a receptacle for both pliable light-wires and rectangular wires simultaneously. The Combination Technique’s single ap-
pliance receptacle offered the ability to achieve the desired treatment procedures and objectives. Their goal was to produce a technique that would correct average as well as severe malocclusions with better results in less time and with greater ease.

This original Combination Technique incorporated a system for moving teeth whereby the teeth remained in place as a result of the equilibrium that existed among the oral musculature including the lips, tongue and the muscles of mastication. Axial correction of root angulations was no longer a problem.

Positioning the mandibular incisors over the basal bone enhanced anchorage potentialities and helped to achieve a more functional and stable occlusion. Any force that disrupted this equilibrium created an environment for the teeth to move. When a very light resilient wire is ligated into a crowded dentition, the wire attempts returning to the original shape. If the wire is tied tightly to the teeth, forces are transmitted reciprocally between the individual teeth in the arch. Any extraneous forces are controlled as a result of the anchorage unit.

During the late 1970s, Fogel and Magill introduced a second-generation combination bracket, which featured a double self-ligating attachment bracket to facilitate wire insertion.

It was called the “Modular Self-Locking Appliance System. Variation of the Combination Technique.” The success of this bracket was hindered by the deficiencies in the metallurgy technology.

The locking mechanism fatigued after several adjustments. The availability of light memory wires had not yet appeared, necessitating more frequent wire changes.

Still, the concept was sound. The Combination Technique was used well into the 1990s and was modified by many of its proponents. During the 1990s, most orthodontists employed some form of light-wire edgewise technique with pre-angled and pre–torqued brackets.

Ligatureless Edgewise brackets first appeared in the 1990s with the Russell Lock appliance (Sathler et al 2011), which was an attempt to improve the clinical effectiveness for moving teeth while reducing the time required to ligate a wire into the brackets.

Numerous articles regarding self-ligating orthodontic brackets can be found in the literature (Self-ligating brackets, 2012), with more than 20 original patents for new self-ligating brackets; some have gone by the wayside and some have lasted the test of time. Sathler et al (2011) provided an excellent review of the literature regarding self-ligating brackets used in orthodontics.

It is interesting to note that many articles describe self-ligating brackets as either the new buzzword or as a faster and more efficient method of tooth movement in orthodontic treatment.

However, in reality the self-ligating bracket has prevailed since the 1990s. It has been more than 50 years since Dr. Raymond Begg introduced his “Light Arch Wire Technique” in the late 1950s (Begg 1961), and Fogel and Magill introduced their Combination Technique in the late 1960s (Fogel & Magill 1969), yet...
Tooth positioning appliances: an orthodontist’s experience

By Barry Raphael, DMD

I’ve been actively involved with early treatment ever since I first saw Jim McNamar in the early 1980s. Since that time, I’ve seen a lot of theories and “systems” come and go. As a specialist with a university training that taught me 14 different treatment styles (University of Pennsylvania, DMD, 1978, and Fairleigh Dickinson University, orthodontics, 1983), I’ve become accustomed to evaluating different ideas, both clinical and research-based and offering my patients the best of all the options available.

I keep my mind open to new ideas but am always skeptical of the “quick fix” solutions to age-old problems. However, though I think research is the key to establishing a real understanding of issues, evidence-based dentistry or evidence-based orthodontics just cannot keep up with clinical innovations and, thus, our experience and judgment is tested on a daily basis.

For years, I wondered about the claims being made about tooth-guidance appliances and whether there was really a place for this type of appliance in my practice. I started to see things differently after seeking a solution to one of the many vexing problems I encounter with fixed appliance therapy every single day: namely, closing open bites. It all started when I had a run of lateral open bites with tongue thrusts that resisted vertical elastics, spurs and everything else I could throw at them. You know the ones when you’re just about to finish up, and the bite just won’t settle down. And getting these cases referred out for the oral surgery they need doesn’t always happen. I now have a certified oral surgeon in my practice.

What caught my eye about tooth-guidance appliances when I first read about them was the fact that they were not solely aimed at influencing the teeth, but that they were focusing on the musculature.

Case 1

This patient presented in my practice at the age of 10 with severe crowding. Treatment involved the use of an upper Farrell Band Wagon System (BWS) combined with MRC’s Soft Pre-Orthodontic (T4K) appliance (Figs. 1a, b). The patient also took part in Trainer Activities to improve oral habits. After a period of 11 months, the BWS was removed and the hard T4K was used. Treatment continues and will use the Myobrace to finish the case (Figs. 2a, b).

Case 2

This patient entered my clinic at nine years of age with a Class II Division 1, bimaxillary malocclusion. As a pragmatist and realist, I see the worldview of a Class II Division 1, bimaxillary malocclusion.

- ABOUT THE AUTHOR

DENNIS J. TARTAKOW, editor in chief of Ortho Tribune, practiced orthodontics, temporomandibular joint (TMD) disorders and orofacial pain therapy in Palm Beach, Fla., and now resides in Marina del Rey, Calif. Tartakow is a consultant in orthodontics, TMD disorders, orofacial pain, practice management and health-care administration. He counsels pre- and postgraduate students, orthodontists and health-care practitioners and has provided expert testimony in numerous orthodontic, TMD and medical-legal litigation cases. His professional accomplishments include being a diplomate of the American Board of Orthodontics, a diplomate of the American Board of Special Care Dentistry, and a certified dental editor. He is clinical associate professor and former director of the TMD section, postgraduate orthodontic department, Nova Southeastern University, College of Dental Medicine, Fort Lauderdale, Fla.; senior attending, postgraduate orthodontic section, Albert Einstein Medical Center, The Maxwell S. Fogel Department of Dental Medicine, Philadelphia; and clinical associate professor, orthodontic department, craniofacial sciences and therapeutics, University of Southern California, School of Dentistry, Los Angeles; former primary adjunct professor, the Union Institute and University, Graduate College, North Miami Beach, Fla.; and Research Council member of the J. Paul Getty Research Institute and Library, Los Angeles.

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As ADEA Executive Director Richard W. Valachovic stated in a monthly newsletter, we must ensure that all graduating dental students glean an appreciation for accessing and applying the knowledge research provides and the value of research.

References

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seldom are they cited in articles, reference lists or bibliographic lists for self-locking brackets.

As John F. Kennedy (1963) so adroitly stated, “A man may die, nations may rise and fall, but an idea lives on…” We must find time to stop and thank the people who make a difference in our lives.”

References

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As ADEA Executive Director Richard W. Valachovic stated in a monthly newsletter, we must ensure that all graduating dental students glean an appreciation for accessing and applying the knowledge research provides and the value of research.

References
lary retrusion. She had a narrow maxillary arch, lip entrapment under the excess overjet, deep anterior overbite and crowding of the lower anterior teeth. She had a forward head posture with habitual open mouth posture. Facial muscles were overactive on swallowing. She also has a low maxillary frenum and a midline diastema (Figs. 3a, 3b).

After one year of treatment with an upper and lower BWS (six and four months, respectively), an i2 trainer (for three months) and an i2 trainer (for six months), the malocclusion and the soft tissue dysfunctions were corrected. The bi-maxillary retrusive skeletal pattern and profile remains at this point, though much growth remains (Figs. 4a, 4b).

Case 3
This patient presented in my clinic at age 7 with an adequate arch form but a deep overbite. This is a perfect case to show how a little interceptive treatment can go a long way to solving problems that would be harder to correct later on (Figs. 5a, 5b).

The Soft T4K was used for four months, followed by the Hard T4K for three months longer, at which point the overbite was resolved. The Hard T4K was used for seven more months, at which point less intensive use of the Hard T4K was prescribed. The T4K was used to assist 10 minutes of daily trainer activities to improve poor oral habits during a period of 18 months, after which the use of the T4K was discontinued. The patient still performs posture exercises for the long term (Figs. 6a, 6b).

Correcting deep overbites with fixed appliances can be difficult, requiring bite planes or turbos along with full strap ups. This case was essentially solved in the first four months and continued to improve thereafter. No other treatment is anticipated.

Every orthodontist knows the musculature is influential on growth and development. For this, the evidence is clear. Angle knew it. Alfred Rogers knew it. Graber knew it and raised holy hell about it. Straub helped create a subspecialty around it. Harvest showed us how critical airway is. The same Profil signed off on Tulloch’s work taught us about postural tongue position. Moss and Enlow showed us how it worked. Estuki Kondo’s “Muscle Wins” shows soft tissues and local factors to be critical in the development of malposition and malocclusion of the teeth.
The question that all these icons of our specialty raise is whether the soft tissues and skeletal structures of the mouth and face are indeed genetically determined, or if perhaps they are subject to the same environmental influences as all other tissues and muscles of our body (Bass 2012). Indeed, you can change the muscle mass of youriceps in two weeks just by stressing it with weights. Likewise, two weeks prone in a hospital bed can render them weak. Why can’t you then apply to the muscles of the mouth?

We also know that bone responds to the forces that surround it, in both the functional and capsular matrices (Boyd 2012). In orthodontics, the action of the mouth? in a hospital bed can render them weak. Indeed, you can change the muscle mass of our body (Boyd 2012). In orthodontics.

When it comes to early treatment, the debate over genotype or phenotype is the by-product of that muscular treatment. So, to me, the debate over genotype or phenotype and the credibility of early treatment and the influence of the musculature is doing “early treatment” to the face whether we are there or not. And what we see by the time kids are “ready for treatment” is the effect of that muscular treatment. And once you learn this lesson, well, the teeth will guide themselves into place.

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Jawonio is a provider of lifespan services in the Hudson Valley for people with developmental disabilities, mental illness and chronic health needs. For more than 60 years, Jawonio has provided support and services for individuals with developmental disabilities and special needs throughout the lower Hudson Valley and Northern New Jersey. In addition to their philanthropic efforts, the Jawonio staff are active in orthodontic research and news in a number of organizations.

Dr. Terry Sobler, a member of the College of Diplomates of the American Board of Orthodontists, the American Association of Orthodontists, the Northeastern Society of Orthodontists (NEOSO), and the New Conn Orthodontic Foundation. He was the chief resident at NYU’s orthodontic programs.

At left, Farrell Bent Wire System (BWS). At right, pre-orthodontic trainer (T4K) by Myofunctional Research (Queensland, Australia).
Scenes from MASO

The Middle Atlantic Society of Orthodontists hosted its annual session at the Hilton Baltimore in September

The Middle Atlantic Society of Orthodontists’ new member on its board of directors is Dr. Tarun (Ty) Saini from Maryland. He joins its existing directors: Dr. Doug Harte, Dr. Russell Sandman, Dr. Robert Penna, and Dr. Normand Boucher, as well as Dr. Lawrence Wang (president elect), Dr. Stephanie Steckel (secretary), Dr. Jean Asmar (treasurer), Dr. Robert Williams (editor), Dr. Nahid Maleki (MASO trustee) and Anita Field (executive director).
3Shape announces official launch of TRIOS for sales in North America

3Shape TRIOS is a complete digital impression solution that includes intraoral scanning, clinical scan-validation, plus seamless communication with the lab

3Shape, a global leader in 3-D scanning technologies and CAD/CAM software for dental applications, declares “all systems go” for nationwide sales of its TRIOS® solution in the United States and Canada. The official announcement was at the American Dental Association’s Annual Session in San Francisco, and now, TRIOS resellers are busily taking orders for next-month delivery of new systems to clinics in the United States and Canada.

Strong network of reselling partners and supporters
3Shape has signed up a wide network of prominent national and local resellers to distribute TRIOS throughout North America to dentists, dental specialists, dental schools and more. 3Shape’s strong distribution foundation has been carefully constructed to ensure optimal geographical coverage and fulfillment of 3Shape’s high standards for customer service and support of its products. TRIOS resellers are all experienced dental supplier professionals and amply trained by 3Shape to install and support TRIOS for their customers in local clinics.

certification and full regulatory compliance in place
The TRIOS system, as a medical device, is continuously developed under the strict regulations of the FDA and ISO 13485 requirements. 3Shape has passed all final safety tests and production inspections required for authorized sales and marketing of the TRIOS system in the USA.

Closing in on complete digital workflows between clinic and lab
TRIOS enables dentists to rapidly capture the complete intraoral situation and send the 3-D model directly to the lab. It does not require pre-spraying of the teeth. The system clinically validates the impression, and includes flexible tools allowing dentists to edit their scans. Labs and dentists can communicate about the case using 3-D design visualizations, annotations and messages. The unique full digital workflow is designed to enhance close collaboration with the lab and allow the dentist to focus more on treating patients. By utilizing the lab’s CAD/CAM expertise, along with its wide range of indications, and materials possibilities, dentists can provide their patients with more treatment options and restorations of the best possible quality and fit.

A market ripe for TRIOS unique impression technologies
In recent months, 3Shape has been touring the United States, demonstrating TRIOS for dental professionals, and the success of these live events affirms the great interest in this new digital impression solution throughout the U.S. dental market.

“We are very excited to bring state-of-the-art intraoral scanner technology to the largest dental market in the world,” said Flemming Thorup, 3Shape’s president and CEO. “The many North American labs that are using 3Shape Dental System®, or those who order our TRIOS separately, will be able to connect with clinics using TRIOs.

“We believe that 3Shape will soon become a strong brand in clinics — just as it has in labs,” Thorup concluded.

In order to further strengthen support and services and closely backup its partners, 3Shape recently established a new office near Los Angeles, ensuring business-hour coverage throughout the country.

About 3Shape
3Shape is a Danish company specializing in the development and marketing of 3-D scanners and CAD/CAM software solutions designed for the creation, processing, analysis and management of high-quality 3-D data for application in complex manufacturing processes. 3Shape envisions the age of the “full digital dental lab,” and its more than 350 developers provide superior innovation power toward reaching this goal. 3Shape’s flexible solutions empower dental professionals through automation of real workflows, and its systems are applied in thousands of labs in more than 90 countries worldwide, putting 3Shape technologies at the peak of the market in relation to units produced per day by dental technicians. With TRIOS, 3Shape now brings its vast expertise and innovation power directly to dentists. 3Shape boosts its first-line distributor support network with a second-line support force of more than 30 in-house experts placed in five support and service centers strategically located around the globe.

3Shape is a privately held company headquartered in Copenhagen, with the market’s largest team dedicated to scanner and software development for the dental segment based in Denmark and Ukraine; production facilities in Poland, and business development and support offices in New Jersey and Asia. For further information regarding 3Shape, refer to www.3shapedental.com. Also visit 3Shape on www.facebook.com/3shape
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