What is pragmatic research?

By Dennis I. Tartakow,
DMD, MED, ED, 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 may be expressed through various social science theories in order to structure the interpretive lens of the postmodern 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 thoughts based on these changes. Conditions in the world determine the basis of knowledge and are centered upon the perspectives of gender, class, race and other group affiliations.

In the beginning of the 20th century, one of the most influential philosophies in America was pragmatism, which has influenced the study of law, education, political and social theory, art and science. The pragmatic research philosophy encompassed six fundamental theses. It was, however, doubtful that any one scholar would have subscribed to all of these. There are many forms of pragmatism, the focus centered upon outcomes, actions, situations and consequences of discovery rather than the forerunner or precursor of the situation. Instead of concentrating on the methodology, the important concern to this researcher was the problem being studied and the questions asked regarding the problem. There are 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 search based upon intended consequences.
6. suggest that research occurs in social, historical, political, or other context.
7. encourage the belief of an external world independent from the mind as well as those within the mind and implies that researchers stop asking questions about reality and laws of nature.

Oftentimes, these conditions are negative and occur in the presence of hierarchies, power and control by individuals of the hierarchy setting. Thus, honest examination of that which is concealed (such as domination, opposition, inconsistency and contradictions) must be identified. Such discussions 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.

This interpretive stance of postmodern perspectives shape the participants selected for a study in order for them to explore the issues, develop the modes of data collection and contemplate the use of the study as follows:

1. Participants address and examine which is concealed as domination, opposition, inconsistency and contradictions that must be brought to the surface.
2. Interview questions address the presence of hierarchies, power and control by individuals of the hierarchy setting.
3. Collection of data is served and carried out by the researcher.
4. Results of the study can be documented in peer-reviewed articles, journals.

Tell us what you think!

Do you have general comments or criticisms you would like to share? Is there a particular topic you would like to see articles about in Ortho Tribune? Let us know by emailing ToddLehr@dental-tribune.com. We look forward to hearing from you! If you would like to make any change to your subscription (name, address or to opt out) please send an email to our database@dental-tribune.com and be sure to include which publication you are referring to. Also, please note that subscription changes can take up to 6 weeks to process.
Cephalometric X-ray to check up-righting of the mandibular incisors

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 un-crowd 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 mechano-therapy 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
light wire, which was later replaced by 0.014, 0.016 and 0.018 round flexible wires, ligated into the edgewise brackets, requiring approximately three to four months to achieve the desired results. This second phase included leveling and aligning maxillary and mandibular arches, closing extraction spaces, uprighting cuspids and bicuspids and correcting rotations of all teeth.

During Stage II (bracket alignment and leveling), a multi-stranded light-wire (Figs. 5a–5b) was used to create controlled general alignment of all teeth, including leveling, correction of rotations, preliminary correction of axial positions, continued overbite correction and establishment of general arch form. Stage II prepared the brackets for the edgewise phase.

Stage III
The third stage was the called the edgewise phase, employing 0.016 × 0.025 rectangular wires, also ligated into the edgewise brackets and taking approximately six to 12 months to achieve results. This third phase included detailed positioning, proper uprighting and ideal axial inclinations of all teeth. The Combination Technique was excellent for treating extraction cases and difficult malocclusions, as well as being very capable of obtaining outstanding results in non-extraction cases.

During Stage III (edgewise), the rectangular archwires (Figs. 4a–4c) was used to achieve ideal arch form and detailed axial positioning of both the crowns and roots of all teeth. This included: (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.

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 incisor root torquing, an auxiliary wire was employed similar to that used by Illeg during Stage III. The torquing auxiliary (Fig. 5) was an 0.014 wire constructed with 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.

Example of the Combination Technique in a severe malocclusion
Treatment of a Class II, Division I severe maxillary protrusion and deep overbite is shown, using maxillary first and mandibular second bicuspids extractions (Figs. 7a–7j).

Incisor coverage biteplate (Figs. 8a–8c) was required as a preliminary step as a result of the severe deep anterior overbite. This created initial bite opening and avoided shearing of brackets, tearing of bands and occlusal interferences.

Combination Technique mechanics

Stage I — Single strand light-wire stage (Figs. 9a–9c)
The objectives of Stage I were to achieve: (a) reduction of the protrusion (edge-to-edge incisor relation), (b) bite opening (molar uprighting and incisor intrusion), (c) incisor uncrowding and (d) Class I cuspid and molar relationships.

Stage II — Edgewise stage (Figs. 10a–10c)
The objectives of Stage II were to achieve: (a) leveling and aligning of all brackets for edgewise archwire placement, (b) preliminary uprighting of cuspids and bicuspids, (c) correction of rotations and labiolingual malpositions, (d) continued bite opening, and (e) arch symmetry.

The advantages of the multiple level-shape appliance when compared to the single-strand wire included a longer range of action, better resistance for distortion, increased flexibility, gentler forces and less fatigue.

Stage III — Edgewise stage (Figs. 11a–11d)
The objectives of Stage III 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 Illeg light-wire and the Tweed edgewise 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 solidly embedded 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-
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 1930s 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 1930s. 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 articulating 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 oralatology they need doesn’t always happen. I now have a certified oralologist 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 bent wire system (BWS) combined with MBK’s Soft Pre-Orthodontic (T4K) appliance (Figs. 1a, 1b).

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, 2b).

Case 2

This patient entered my clinic at nine years of age with a Class II Division 1, bimaxil-

About the author

DENNIS J. TARTAKOW, editor in chief of Ortho Tribune, practiced orthodontics, temporomandibular joint (TMJ) disorders and orofacial pain therapy in Palm Beach, Fla., and now resides in Marina del Rey, Calif. Tartakow is a consultant in orthodontics, TMJ 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, TMJ and medical-legal litigation cases. His professional accomplishments include being a diplomat 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. Fogg 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.

• COMBINATION, Page 5

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


