

An Interview with Professor Frank Yuh-Yuan Shiau

Dr Li-Deh Lin (left) with Prof Frank Yuh-Yuan Shiau.

Let's begin with a synopsis of your familial and educational backgrounds, reasons for career choices, and individuals who may have influenced your decisions to become what you are today.

I was born in Taipei, Taiwan, in 1942 when Taiwan was ruled by Japan. In fact, my father and elder brothers were all educated as Japanese. After World War II, Chinese troops took over Taiwan, which led to the regrettable conflicts between being Chinese or Japanese that combined with a corrupt incumbent government's role to cause bloody riots in 1946. By the end of 1949, Chinese nationalists were driven out of China by the Chinese communists, which led to a separation between Taiwan and China. Martial law was imposed in Taiwan and lasted for 30 years, with a resultant serious restriction in political freedom. As a result of this unfortunate experience, numerous Taiwanese families were inclined to regard the study of law or political sciences to be very risky. The threat of martial law influenced my family to encourage me to study medicine or dentistry instead of politics or liberal arts. Although I loved art and literature when I was a high school student, I followed my father's and elder brothers' advice and enrolled in the dental school at National Taiwan University (NTU).

My education in dental school was led by teachers who had been trained in Japan, and our dental education system was influenced accordingly. This was eventually replaced by an "American-style" dental education; however, the learning process and training methods were far from ideal—a far cry from the near-universal pedagogic excellence enjoyed by today's students. I well recall attending a confusing clinical conference wherein the debate on the concept of "centric relation" and "centric occlusion" led me to the realization that I had to seek furthering my training and education abroad if I wanted to understand the real significance of jaw relations and the role of occlusion. I therefore wrote Dr Major Ash at the University of Michigan to seek his permission to study there. He was widely regarded at the time as a leading scientist on occlusion, and his prompt and favorable response facilitated my enrollment as a postgraduate student in Ann Arbor in 1977. I obtained a Master's degree from the University of Michigan in 1979, where an intellectually freewheeling environment and unlimited information supply also provided me with access to documents relating to historic facts about China and Taiwan. Along with my professional learning and training, I also acquired personal insight into political realities and the fact that Taiwan can neither represent China nor belong to it, which

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further reinforced my sense of being Taiwanese rather than Chinese. At the University of Michigan, I was guided by Dr Ash himself and read a lot about the confusing concepts of occlusion. As a prosthodontist, I also took courses in fixed prosthodontics, in which Dr Clayton introduced me to concepts and the use of fully adjustable articulators and jaw motion tracing devices. This led to my purchasing of a Denar articulator with a pantograph set, which I brought back to Taiwan in 1979—the first jaw motion-tracing device in Taiwan.

I also met and worked with Drs Iven Klineberg, Sandro Palla, Christian Stohler, Yoshinobu Kobayashi, and Yoshiaki Yamada, who remain good friends and who I often meet up with at international conferences and on other occasions. I continue to regard my years of study in the United States as an important and wonderful period in my life. I felt that an understanding of functional jaw movement combined with electromyography (EMG) research assessments enabled me to explain what a dentist needs to know to diagnose and manage occlusal problems as well as to recognize the pitfalls a dentist should avoid during daily practice.

I returned to NTU in a full-time teaching and research role, where in addition to my prosthodontic teaching and practice, I also established an undergraduate course on occlusion and a temporomandibular disorders (TMD) and orofacial pain clinic in the university hospital. Before I retired in 2008, I split my university responsibilities between prosthodontics (70%) and TMD (30%).

Which individual and scholarly ideas have been especially prominent in your career?

Dr Major Ash was most certainly the most influential person in my life. He was one of the pioneers in the scientific establishment of dental occlusion and masticatory function analysis, and I learned a lot from him as a graduate student. He guided me on the thinking and questioning of different concepts of occlusion and their relationship with orofacial functional disorders and pain. Moreover, his logical way of thinking and philosophic manner in dealing with things and people influenced me even more. Dr Ash was a solemn and serious person who did not ask straightforward questions. I frequently had to guess what he really wanted and often felt awkward before he was satisfied with my response. I gradually got used to his way of speaking and his philosophic teaching; the "tension" between us was relieved and we became friends who could share both good and bad things together. His special interest in EMG of the masticatory muscles was quite new to me at the time, and he strongly encouraged me to take an 8– credit hour course in neuroscience that was given at the University of Michigan Medical School. It was a tough course that included didactic classes, paper readings, and group discussions, but Dr Ash regarded it a prerequisite for his graduate students. Dr Ash was satisfied with my performance in the course, and I was therefore encouraged to do research work related to EMG, which was the main instrumentation of my thesis. There are, of course, many pitfalls in the interpretation of EMG findings, since all too often data obtained after many weeks of recording proved to be useless, but I learned a great deal from those early failed attempts.

In the second year of my graduate studies, Dr Ash encouraged me to stay for a few more years as a PhD student in neuroscience. In the meantime (1978), the United States had severed diplomatic ties with Taiwan, and many Taiwanese chose to flee Taiwan to seek a better future elsewhere. I had several good reasons to remain with my family in the United States when they came to visit me in the summer of 1978. Had I taken advantage of the opportunity, I would have probably become a US citizen and pursued a teaching career there, but my commitment to my university and love for my country demanded otherwise.

In 1982, 2 years after I returned to Taiwan from the United States, I invited both Drs Ash and Ramfjord to visit Taiwan, and they gave continuing education courses on TMD and occlusion to Taiwanese dentists. Both teachers took their lectures and demonstrations very seriously and regarded their teaching duties as absolute priorities as opposed to attending the dinner parties and sightseeing tours that were arranged for them. They spent all of their time preparing the courses and training assistants from my university to help in their teaching. Those assistants are now active dentists in Taiwan and recall Dr Ash's additional visits to Taiwan with great pleasure. He was highly respected and appreciated by all of us here, and I continue to regard him as my mentor.

How has your sense of scholarship coalesced and focused over the years? Can you comment on your major influences over the years and their relationship to your personal objectives?

During my teaching years at NTU and in the university hospital, I was devoted to selecting and nurturing young staff in the areas of TMD and neuroscience. I encouraged several young colleagues from dental schools in Taiwan to study occlusion at the University of Michigan, and some even joined the PhD program provided by Dr Palla at the University of Zurich. All of them became key members of the TMD study group and the Taiwan Academy of Craniomandibular Disorders, which officially started only a few years ago.

As a pioneer in establishing a course on occlusion and a TMD clinic in Taiwan, and together with help from my colleagues, I also organized several graduate and undergraduate courses at NTU, such as physiology of occlusion, articulators, oral rehabilitation, and diagnosis and treatment of orofacial pain. In 1990, I became the first director of the Graduate Institute of Oral Biology and recruited some basic scientists for the institute. The idea was to strengthen the basic and clinical collaboration and let basic scientists conduct intensive research related to oral and dental structures with dental clinicians. This type of collaboration led to a substantial increase in the quality and quantity of staff publications from our dental school. It also permitted basic scientists to feel more comfortable in the oral biology institute because they knew how they could help with their expertise and wet-lab techniques. Before my retirement, I was also involved in some administrative activities as the associate dean for student affairs in the medical college.

As a dentist, I have never abandoned my interest in art. In the last 10 years of my academic career, I organized a course on medicine and art for first-year students in the medical college at NTU. Many professional artists from different art institutes in Taiwan were invited to teach art history and appreciation. Through this course, I encouraged medical and dental students to learn how to enjoy and appreciate art, which might influence their attitudes and ways of thinking in their future professional practices.

What is your main interest in research and teaching as a prosthodontist? Are you satisfied with the outcomes of your efforts?

My main research interest is the study of masticatory function. I regard this as an interesting parameter for the evaluation of natural and artificial tooth forms together with mastication in the presence or absence of pain or disorders. However, standard test foods with constant physical characteristics are necessary for such comparisons. For this purpose, I developed known hard artificial test foods such as candies or food pills and soft foods such as chewing gum containing fine radiopaque particles. I believe that with such standardized test foods, comparison of masticatory ability can be more objective and convincing. On the other hand, a change of occlusal form of natural teeth was also observed by applying a working interference on posterior teeth. I found a high adaptability of normal volunteers on such occlusal change, with very minimal complaints of muscle pain. In 1995, I was invited to lead a project related to the research on magnetic attachments used for denture and maxillofacial prostheses. Around 1990, Aichi Steel Company in Japan was able to produce small but powerful magnets for the automobile industry, and that development raised interest regarding its used in dentistry. In cooperation with engineers, led by Yoshinobu Honkura, and dentists in Japan, Korea, Taiwan, and England, a research project was founded and the use of magnetic attachments was promoted. I appreciated the smart designs of magnetic attachments, which are powerful (up to 800 g/f) and small in size (< 1 mm thick) with anticorrosion encapsulation. Magnetic attachments have now become one of the options for the retention of removable partial dentures and overdentures that rest on either natural teeth or implant fixtures. The International Research Project for Magnetic Dentistry (IRPMD) was formed in 1996, with required financial support provided by the Aichi Steel Company. As a member of that project, I had the chance to learn from physicists like Dr Honkura and further recognized the importance of collaboration between basic scientists and clinicians. With this type of collaboration model, I have encouraged many dental colleagues and my friends in industry to work together on laser dentistry, computeraided design/computer-assisted manufacture (CAD/ CAM), and tissue regeneration research.

In addition to my research and teaching of occlusion and prosthodontics, I worked on my hobby of bone collecting. I devoted time to the collection and preparation of skulls of mammals, reptiles, and fish, since cranial bones in particular are integral parts of my teaching materials when occlusal concepts are mentioned, especially since food intake function is related to the dental anatomy and jaw bone growth. I found that nature decides the form and position of the bones and teeth while teeth contact patterns are not very important in most animals other than humans. No premolar occlusion appears to be needed in reptiles, fish, and many carnivorous animals such as dogs. Besides, canines are often regarded as powerful teeth for fighting, but in some mammals, such as muntjac, long canines are only a symbol of being male.

Please describe your international collaboration on prosthodontics and TMD studies in Asia.

From 1980 until my recent retirement, I led the International Association for Dental Research (IADR) group in Taiwan to participate in IADR meetings held all over the world. I presented my work for 20 consecutive years in general sessions and the Southeast Asia division meetings, and was the president of that division and the neuroscience/TMD group of the IADR at large. In 1986, Dr Sung-Woo Lee of Seoul National University visited me in Taipei to plan the formation of the Asian Academy of Craniomandibular Disorders (AACMD). His strong leadership and enthusiasm persuaded me to assist in the invitation of numerous scholars from Japan, Korea, Singapore, and Taiwan to found the academy. The AACMD was founded in 1988, and now the second generation of craniomaxillofacial disorder specialists is leading the academy, although my participation has continued.

In recognizing the importance of the prosthodontic specialty, I became one of the founding members of the Academy of Prosthetic Dentistry in Taiwan. The Taiwan academy joined the Asian Academy of Prosthodontics (AAP) in 1996, and I became the president of the AAP in 1998. With the collaboration of domestic colleagues and Asian friends from Japan and Korea, basic and clinical research on prosthodontics and TMD are encouraged and promoted. Quite often, Asian scholars do excellent research work but cannot fully demonstrate their skills at international conferences because of their lack of facility with the English language. Regrettably, some cannot even respond to questions after their presentations, so together with some leaders in relevant academies, I tried to help young investigators present their papers in a proper manner. In 2009, the AAP invited the IJP editor-in-chief to Seoul to work together with Dr Li-Deh Lin (an associate editor of the journal) to enhance the communication and teaching abilities of Asian young prosthodontic educators. The latter educators learned a lot from that workshop, and both AAP leaders and I very much appreciated the program.

Would you like to say a few words to the younger generation on occlusion and prosthodontics?

My education at the University of Michigan and later long-term clinical practice and research provided me chances of observing the changes in concepts of dental occlusion on TMD. Since the early 1980s, psychoemotional effects were gradually regarded as dominant etiologic factors of TMD, and the role of occlusion was no longer emphasized. It is frequent to find uncertainty regarding the impact of occlusal factors on the development of TMD; the effects of dental occlusion are even completely ignored occasionally. Our study of providing working-side interference was also unable to demonstrate a definite relationship with pain or disorders of the masticatory system. Psychologic disorders can develop disorders of many parts of the body, including the masticatory system. However, in my opinion, combined with the psychologic factors, unstable or insufficient dental support may trigger, predispose, or perpetuate the formation of TMD. Prosthodontists are prone to make sudden changes of occlusion that made human adaptation insufficient or inappropriate. I always remind my students that in both traditional and implant-supported prosthodontics, we should not take patients' adaptability for granted. Moreover, we should never initiate prosthodontic work on TMD patients, but more importantly, we should not create TMD patients as a result of our treatment interventions.

In conclusion, I remain a prosthodontist who sought specialized knowledge in TMD and masticatory function. I feel grateful that I had the opportunity to pursue a career of clinical scholarship that enabled me to meet and work with a wide spectrum of international colleagues, as well as having had the opportunity to influence so many outstanding young dental professionals. My retirement permits me to be selective about what I now do on both my home and academic fronts. But above all, I look back on a happy career that has made me feel fulfilled and useful to society. I can readily say that I have much to be thankful for. Copyright of International Journal of Prosthodontics is the property of Quintessence Publishing Company Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.