

Narrative Report Lecture Tour to Jordan and Turkey

Suzanne Boyce

I arrived in Amman on the evening of May 14, 2023. The Jordan University of Science and Technology (JUST) had reserved a room for me in the Kempinski Hotel Shmesani Amman for two nights. For the following 2 nights I was accommodated at the private home of my colleague Dr. Firas Al-Fwaress.

The following schedule describes my activities for the 4 days of my stay in Amman, Jordan.

On May 15, 2023, I met with the dean of the College of Health and faculty members of the JUST program in Speech Pathology and Physical Therapy. In the morning, I gave a lecture in Salah Eldeen Auditorium to an audience of faculty and students in Speech-Language Pathology. The subject of my lecture was (1) how ultrasound can be used to track tongue motion for speech therapy, and (2) my own research on using ultrasound tracking of tongue motion as the input for gamifying feedback in therapy for speech production disorders. The basic argument is that auditory feedback (from a teacher or as experienced by the speaker) is not always effective when speakers are trying to change their pronunciation. When the feedback comes from another person, it is also delayed relative to the speaker's memory for how they configured their articulators. At the same time, research in motor control shows that people learn to change their movement patterns best when they don't think about their bodies. In our research, we track tongue motion from ultrasound, apply an algorithm to decide if the motion will result in an accurate production, and return visual feedback to the speaker on whether his or her speech attempt was accurate. My lecture focused on rhotic sounds in English, but I had previously recorded ultrasound data from Arabic speakers and I was also able to illustrate how ultrasound tracking of the tongue can be useful for speech therapy in Arabic. In the afternoon, I gave a lecture on using the same technology we use to track tongue motion for speech to track tongue and hyoid bone movement using ultrasound for swallowing therapy. This was interesting to the audience as their job is to provide clinical services on speech production disorders and swallowing disorders to patients.

On May 16, 2023, I was driven back to JUST and in the morning I gave a lecture to faculty and students on the subject of how nasometry, which is a technique for deriving articulatory data on relative nasal vs oral airflow, can be sensitive enough to track velopharyngeal port movement in normal speakers. It is well known in the Linguistics world (but less well-known either in the world of Speech Technology or in the clinical Speech Pathology world) that speakers of different languages use very different patterns of movement for nasality, even on the same string of phonemes. These different patterns play a significant role in perceptions of foreign accent, but they are not well understood because data on velopharyngeal movement is difficult to obtain. These patterns are also a potentially sensitive measure of success in surgery for children and adults with velopharyngeal incompetence due to cleft palate. The data I presented showed both that nasometry is sensitive enough to track these patterns with accurate timing. I also presented data from our work on the technology of speech inversion, showing that speech inversion systems are much improved when data on velopharyngeal movement for nasality is incorporated.

Monday May, 15, 2023 Venue: Salah Eldeen Auditorium

Time	Activity	Faculty
8:45 – 10:00	Driving from hotel at Amman to JUST at Irbid	
10:00 - 10:30	Meeting with the dean and faculty members	
10:30 – 11:30	Incorporating Ultrasound into Speech Therapy	Dr. Boyce
11:30 – 12:00	Discussion & Coffee break	
12:00 – 1:00	Ultrasound as a Tool for Swallowing Diagnosis and Therapy	Dr. Boyce
1:00 – 2:00	Lunch break	
2:00 – 3:00	Heading to hotel in Amman	

Tuesday May, 16, 2023 Venue: Salah Eldeen Auditorium

Time	Activity	Faculty
9:00 – 10:00	Driving from hotel at Amman to JUST at Irbid	
10:00 – 11:00	Tracking the Timing of Velopharyngeal Movements During Speech: Validating Nasometry with Nasopharyngoscopy	Dr. Boyce
11:00 – 11:30	Strategies of Swallowing Assessment	Dr. Alfwaress
11:30 – 12:00	Discussion & Coffee break	
12:00 – 1:00	Touring Audiology and Speech Pathology Clinics	
1:00 – 2:00	Lunch break	
2:00 – 3:00	Heading to Amman	

Wednesday May, 17, 2023 Workshop Venue: Philadelphia Hall

Time	Activity	Faculty
9:00 – 10:00	Driving from home to Philadelphia center at Amman	
10:00 – 11:00	Incorporating Ultrasound into Speech Therapy	Dr. Boyce
11:00 – 11:45	Strategies of Swallowing Assessment and Criteria of Prognosis	Dr. Alfwaress
11:45 – 12:00	Coffee break	
12:00 – 1:00	Interpreting Images for Speech and Swallowing Presentation of Ultrasound Videos	Dr. Boyce
1:00 – 2:00	Lunch break	
2:00 – 3:00	FEES demonstration Oral Stroboscopy demonstration	Dr. Alfwaress
3:00 – 4:00	Hands-on Training of U/S by Participants Hands-on Training of Nasal/Oral Laryngoscopy	Dr. Boyce Dr. Alfwaress

On May 18, I spent time with my host, Dr. Alfwaress, and his family before boarding my flight to Istanbul, Turkey. I was met at the airport by Dr. Ahmed Konrot, the main organizer and chair of the Turkish National Speech and Language Conference (UDKB) and a faculty member at Uskudar

University in Istanbul, who conveyed me to the conference hotel, the Mercure Istanbul Umraniye. I spent the nights of May 18, 19 and 20 in that hotel. Accommodation was provided by Anadolu University & the Association of Turkish Speech and Language Therapists. The notice of the conference can be found at <https://dkbk.org/>.

On May 20, I delivered my invited keynote talk to an audience of approximately 150 attendees at the UDKB conference. I have recently received from the organizers of the conference a recording of that talk. Note that this talk was delivered in English but was simultaneously translated into Turkish by a very knowledgeable faculty member at Anadolu University. Later in the day, I conducted a workshop for approximately 30 students from various universities across Turkey, on the use of ultrasound technology for speech research and speech therapy as well as swallowing therapy. The centerpiece of the workshop was the portable Butterfly IQ Ultrasound Scanner I had brought with me, which approximately 1/3 of the students were able to test out for themselves.

On the last day of the conference, I left Istanbul to travel to Anadolu University in Eskisehir with Dr. Mavis Ilknur, Dean of the Faculty of Health Sciences in a private car. I do not have an official schedule of events from my time in Eskisehir.

Accommodation at Anadolu University was provided in the Anadolu University guest house from May 21-23. At the university, I was made very welcome and met a number of faculty, staff and students. On May 22, I gave a formal lecture in the morning reprising my talk in Istanbul to an audience of faculty and students who had not been able to travel to Istanbul. In the afternoon, I had a tour of the university with a PhD student in the Speech Pathology program. Later that afternoon, I gave a workshop on the technology and techniques for using ultrasound for speech and swallowing diagnosis and therapy, as we have experienced at the University of Cincinnati. This workshop was attended by faculty and graduate students. During the workshop I was able to demonstrate how we use ultrasound using the portable Butterfly IQ ultrasound scanner I brought with me, and I was able to explore the system installed in the Phonetics Lab of the department there. I had dinner with Dr. Ilknur Mavis, the dean of the department and a fellow speech-language pathologist who pioneered the use of ultrasound for speech therapy in Turkey.

The following day, May 23, I gave a short talk discussing my research on speech inversion for detection of velopharyngeal movement, and the potential use of this speech processing technology for clinical work with the cleft palate population. I was also able to demonstrate the use of the internet for exploration of databases showing Magnetic Resonance Imaging of speech production. My hosts then took me on a tour of Eskisehir, which is a very interesting Turkish city and a center of Ukrainian Tatar refugee culture.

My hosts sent me back to Istanbul on the regular train service between Eskisehir and Istanbul. I spent the night of May 24 at the Anadolu University guest house in Istanbul and flew back to the United States the following morning.

A recorded version of my invited lecture to the Turkish National Speech and Language Conference, given on May 20, has recently been provided to me. It is posted on the following Google Drive location:

https://drive.google.com/file/d/1P4sldQTyDmf-5VteOJf_tAIY3fQ9X7IF/view?usp=drive_link.