ARTHUR S. ABRAMSON

Arthur S. Abramson, former Secretary, Vice President, and President (1983) of the Linguistic Society of America, died on December 15, 2017, at the age of ninety-two.[1] He was a central figure in the linguistic study of tone, voicing, voice quality, and duration, primarily in their phonetic realization. His seminal work with Leigh Lisker (Lisker & Abramson 1964) introduced the metric VOICE ONSET TIME (VOT), which has become perhaps the most widely used measure in phonetics. He contributed to the field in numerous other ways; in addition to his work for the LSA, he became the first chair of the Linguistics Department of the University of Connecticut, served as editor of *Language and Speech*, and was a long-term researcher and board member of Haskins Laboratories.

LIFE. Arthur was born January 26, 1925, in Jersey City, New Jersey. He learned Biblical Hebrew in his childhood, and then followed up with post-Biblical Hebrew later on. Yiddish was also part of his background. His parents were born in the US, but his grandparents were not, and they primarily spoke Yiddish. He learned some from his mother, and it came in handy when he served in the US Army in Europe during World War II. (Many years later, he taught it at the University of Connecticut in the Center for Judaic Studies, which he helped establish.) He became fluent in French, starting from classes in high school, where he was lucky enough to have a native speaker as a teacher. (The teacher was Belgian, and Arthur was sometimes said, by French colleagues, to have a Belgian accent.) Arthur had an early introduction to synthetic speech when he attended the New York World's Fair in 1939. He saw and heard Homer Dudley's Voder there, but it did not immediately strike him that speech synthesis would be a major part of his life's work.

Arthur began his college education at Rutgers University, with a major in botany and a minor in French. This would lead to some teaching in the school system of Jersey City, NJ, which Arthur thought could be a worthwhile career. As with many of his generation, however, the onset of World War II interrupted his trajectory. At the end of his first year of college (1943), he went into the US Army, where he served for three years as an x-ray technician in the field hospitals. He did not participate in the Normandy invasion, but he was diligently processing x-rays of the wounded soldiers returning from the front. Once the beachheads had been established and the breakthroughs made across the enemy lines, he entered continental Europe with the rest of the US Army. He was not exposed to direct fire after that, but he had much paramedical work to perform. As the fighting died down, his fluency in French was useful for helping his unit interact with the local populace, but Yiddish also played a role. At the end of hostilities but before demobilization, Arthur and several other Jewish soldiers attended a French rabbi's weekly Sabbath table, where Yiddish was the main language spoken, and Arthur's fluency increased there. He would often augment his Yiddish with his estimate of how the cognate Hebrew word would have been modified—usually successfully, if you discount the laughter that accompanied the subsequent corrections.

[1] Facts and some other aspects of this obituary have been taken from the Haskins Laboratories oral history (Abramson 2013), as well as from colleagues, friends, and family members, including Donald Shankweiler, Carol A. Fowler, Joseph Abramson, Robert Remez, Kenneth R. Pugh, and Philip E. Rubin.

After returning from Europe, Arthur completed his undergraduate degree at Yeshiva University in 1949. He was in a double program, both Jewish studies (in Hebrew) and French, but he still had not yet heard of linguistics as a formal discipline. When he graduated, his language interests led him to think about teaching, and he began doing so at Columbia University Teacher's College. Ilene Kitchen, an applied linguist there, inspired him, and led him to consult with the head of the Linguistics Program at the Columbia University Graduate School, André Martinet. Martinet said that Arthur 'belonged there'. Once beginning classes, Arthur found that his interest was in the sounds of language. Uriel Weinreich was an instructor, giving him a sense of the history of sound change. Arthur received an M.A. in teaching from Columbia in 1950.

In graduate school, Arthur added Sanskrit to his arsenal of languages, to support his burgeoning interest in Southeast Asia. This interest led to conversations with various colleagues and people at the Department of State, who recommended the Fulbright teaching grant program. Application to the program was a long-drawn-out process, during the course of which Arthur got married to Ruth 'Ruby' Melamed. Fortunately, she agreed to go to Thailand if he received the grant. Thus from 1953 to 1955, Arthur, still a graduate student in linguistics at Columbia, would teach English in Thailand funded by a Fulbright fellowship. (The original one-year appointment turned into three because the replacement instructor was scared off by the war in Indochina.) As one might expect, he began learning Thai, starting with a children's primer. He also made contact with the linguists in the country. (William Gedney, who had done a great deal of work on Thai, unfortunately left before Arthur could meet with him.) Marvin Brown, another linguist, was teaching language in Thailand as well. Arthur started his work in the south of Thailand (Songkhla), and later moved to Bangkok. This was the beginning of a decades-long relationship with Thailand, Thai, and the various linguists (from the US, Thailand, and elsewhere) interested in Southeast Asia.

When Arthur returned from Thailand in 1955 to finish his Ph.D., his principal advisor was John Lotz, who was on friendly terms with Frank Cooper, of Haskins Laboratories. Arthur learned from Lotz that Cooper had agreed to become an adjunct professor at Columbia to teach Acoustic Phonetics. Martin Joos's book with that title had recently come out (1948). Cooper also took part in the Phonetics and Phonemics course. Arthur helped with that course when Lotz was ill. For Arthur's dissertation project on the tones and vowels of Thai, Lotz was official advisor, but Cooper was really the major influence, with the work being done at Haskins. Joseph Greenberg, in Anthropology, was another of his professors and eventually served on his Ph.D. committee. The dissertation reported an extensive array of acoustic measurements of Thai speech, but also included perceptual tests to determine which acoustic patterns listeners used in their judgments. Studying production and perception in combination was very unusual at the time, and continues to be relatively rare despite its importance. The dissertation was later published by Indiana University as a monograph supplement to the *International Journal of American Linguistics* (Abramson 1962). Although Arthur had lived in Thailand, the data were not obtained there, but rather in New York City. There were plenty of Thai graduate students around, many of them 'fresh off the boat', as Arthur liked to say. Of course, he still had contacts in 'the old country', as he usually called Thailand, so, in later years, data collection was usually carried out there.

Even before he defended his Ph.D. in 1960, Arthur had joined the staff of Haskins in 1959, supported by the US Office of Education and the American Council of Learned Societies (ACLS). Frank Cooper had been persuaded to undertake a study of a number of languages—Mandarin, Syrian Arabic, Russian, and Hungarian—using x-rays ac-

companied by ‘stretched speech’. The intent was to slow down the x-ray film enough so that learners of the languages could see the articulation, but the speech needed to be slowed as well, to match the x-ray images. The team made a pilot film on English, for which Arthur served as the speaker. The x-ray filming was done at Columbia-Presbyterian Hospital. The radiologists made sure they did not overdose anyone, and, indeed, one subject (Arthur) lived another fifty-seven years. To synchronize the sound with the slowed x-ray, the team used a variable-speed tape machine coupled with a vocoder, which allowed the ‘stretching’ of the sound without lowering the F0 or the formants. (David Speaker was one of the technicians, though not one of the speakers!) For instructional purposes, the researchers tried to obtain naturalistic speech. They encountered a challenge with the Arabic speakers, however, because they all wanted to speak classical Arabic rather than the vernacular. The scripts included all consonants and vowels for each language, and the tones for Mandarin. The finished product may have been used in some schools, but there is no clear record of that. The films were used at Haskins Labs occasionally for purposes of illustration, but no systematic study seems to have been published. Nonetheless, the method of using images of the tongue during speech for didactic purposes has proven to be effective, with the more accessible technology of ultrasound taking the place of x-rays (e.g. Gick et al. 2008).

Arthur did some part-time teaching at Hunter College and New York University. Nonetheless, Cooper had said he was concerned about Arthur’s career, not being sure how long Haskins Labs would remain in business. Arthur was thus advised to keep his eyes open for an academic position in the Northeast, so he could be at Haskins part time. Such a position appeared unexpectedly: Arthur Bronstein, a phonetician in the Speech and Hearing Department at Queens College of the City University of New York, called Arthur seeking recommendations for a replacement speech scientist. Bronstein was quite pleased when Arthur said, ‘How about me?’. Arthur not only was hired but came in as an Associate Professor, since he already had some publications. CUNY was not emphasizing research at the time, but his research was rewarded nonetheless. He taught at Queens College, with a one-year interruption to serve as caretaker president at Haskins Labs while Cooper (the president) and Alvin Liberman (co-founder of speech research at Haskins) were visiting Stanford University as fellows of the Center for Advanced Studies in the Behavioral Sciences. That year, Cooper kept in touch with Arthur, but the business of the Labs continued rather uneventfully. For the most part Arthur just made sure that everything was harmonious, but a few items did call for attention. One of the researchers was a gruff, critical person, so Arthur had to smooth some feathers he had ruffled. Doug Hogan of the Department of Defense would sometimes call, wanting Haskins to take on more work on speech coding. There was pressure to move Haskins out of its location above a necktie factory on 43rd Street in New York City. Nevertheless, there were no serious changes during that time—though there was one temptation. There was a lot of talk of dolphin ‘speech’ at that time, which Jarvis Bastian (University of California, Davis) would follow up on, and Bastian and Arthur had one oral (unpublished) presentation on dolphin perception of (human) speech rate and vowel length. Arthur joked that he would tell Cooper that Haskins had ordered a dolphin, to be put SOMEWHERE (the plan was rather vague). Once this caretaker year was over, Arthur was lucky enough to be hired back at Queens, and also spent some time at the CUNY Graduate Center. After the second stint at Queens, Arthur took a new position, as the first chair of the new Linguistics Department at the University of Connecticut.

During this time in New York, Arthur became acquainted with Leigh Lisker (University of Pennsylvania and Haskins), and he was attracted to his way of thinking. They

talked and shared meals, so it was very easy to fall into a collaboration. Arthur and Leigh were the only World War II veterans at Haskins, which contributed to their bond. On the phonetic front, they began to discuss voicing. Liberman and others had already done an experiment in which they delayed the onset of the first formant relative to the others ('F1 cutback'), resulting in changes in the perception of consonant voicing (Liberman et al. 1958). However, Leigh and Arthur thought that F1 cutback must be only part of the voicing distinction. They began to study stop consonants more thoroughly, partly because the moment of constriction release is a convenient reference point for the articulation. They focused on stops in syllable-initial position, with the 1964 paper in *Word* being the highly cited result (Lisker & Abramson 1964).

INTELLECTUAL LEGACY. Very few studies of the phonetic realization of tone had been done when Arthur began his dissertation work (Abramson 1962). The sound spectrograph used to extract the acoustic measurements was still a rather novel device, after its introduction by Potter, Kopp, and Green (1947) and Joos (1948). Also relatively new was the Pattern Playback machine (Cooper et al. 1952), which allowed direct manipulation of acoustic patterns for perceptual experiments. Newer, and less storied, was the Intonator (Borst & Cooper 1957), a vocoder-based synthesizer that allowed for manipulation of fundamental frequency. The thoroughness of Arthur's investigation is seldom achieved in current times despite the greater ease of analysis and synthesis, and the results are still relevant and cited to this day.

Collaboration was (and is) a hallmark of the research conducted at Haskins Laboratories, and the work arising from the Abramson and Lisker partnership became the best-known aspect of Arthur's research career; in fact, the 1964 paper is one of the most widely cited papers in all of phonetics. Voicing distinctions have a variety of realizations in the world's languages, but Leigh and Arthur devised a relatively simple metric that captured a great deal of what is relevant: VOT. Following on Lisker & Abramson 1964, the pair published numerous subsequent articles. A paper in *Language* (Lisker & Abramson 1971; see also Lisker & Abramson 1987) provided an extensive critique of the distinctive features proposed by Chomsky and Halle (1968) for characterizing voicing and aspiration. They also continued to investigate the challenge of the three-way distinction in Korean (Abramson & Lisker 1972), and explored how VOT varied with phonetic context (Lisker & Abramson 1967) and could be used in studies of categorical perception (Abramson & Lisker 1970). Various secondary cues to voicing were acknowledged (e.g. Abramson 1999, Whalen et al. 1990), but the simplicity of the measure, combined with its coverage of the main features of voicing, continues to keep VOT a standard measure in phonetics (Abramson & Whalen 2017).

Arthur also contributed to other Haskins collaborations that developed innovative physiological methods for studying laryngeal control in consonants. These included fiberoptic observation of the larynx (Sawashima et al. 1970), filming the larynx at speeds that were high for the time (Cooper et al. 1971), and using a light source into the upper pharynx and a photosensor to detect light below the larynx. This last method, dubbed 'transillumination' (Lisker et al. 1969), allowed Arthur and colleagues to quantify glottal opening.

Throughout his life, Arthur would continue to investigate Thai. Topics included the tonal system (Abramson 1997), vowel length distinctions (Abramson & Ren 1990), and the final stops (Abramson 1972). Arthur also studied some unusual phonological contrasts that could be found in lesser-known languages of the region. For example, while many languages distinguish geminate from singleton stops, very few do so for voiceless

stops in utterance-initial position. Arthur found that Pattani Malay did so, with the contrast signaled by amplitude and F0 rather than duration (Abramson 1986, 1991, 1999). Voice-quality distinctions in Suai were found to be shifting toward length distinctions (Abramson et al. 2004), while those in Mon were more stable (Abramson et al. 2015). An extremely rare aspiration distinction for fricatives was found in Sgaw Karen (Abramson 1995). Throughout this research, Arthur continued to combine investigations of acoustic and physiological measures with tests of the measures' perceptual relevance, a methodology that led to substantial and solid results that served as a foundation for subsequent work on Southeast Asian languages.

SERVICE TO THE LINGUISTIC SOCIETY OF AMERICA AND THE FIELD. Academics often concentrate on the most interesting part of their jobs, their empirical accomplishments or theoretical developments, forgetting just how much support the enterprise requires. Arthur, along with his achievements in research, contributed to the infrastructure of linguistics throughout his career. Serving as the first chair of the Department of Linguistics at the University of Connecticut, of course, put him on that path. But he later served as editor of *Language and Speech* from 1979 to 1988. Then, tackling one of the more challenging jobs of the LSA, Arthur was Secretary/Treasurer for five years (1974–1979). Several years later (1983), he served as President of the Society.

Along with Arthur's extensive service to the community at large, he was a pillar of support at Haskins Laboratories as well. As mentioned, he served as de facto president for one year in the early days (1964–1965) and remained a major scientific contributor for almost fifty years. For many years, he was Secretary to the Haskins Board of Directors as well as the Haskins Corporation (two slightly different legal entities). His minutes of board meetings were always on-target and timely, giving a depth of continuity to the governance of an organization with a constantly shifting set of participants.

When Arthur arrived at Haskins Laboratories, he noted that he was very soon struck by the atmosphere: 'I mean, it was a heady mixture … of people and ideas, freedom to do things. And very interdisciplinary' (Abramson 2013). Throughout the decades that followed, Arthur contributed substantially to that atmosphere. He was perennially interested in what was being done, reached out to new students and other members of the lab community, and always had a question at weekly talks, whatever the topic. Anyone who came to him for guidance came away better informed. An enduring characteristic that was foremost, however, was Arthur's ability to connect with many varied people, on their level, in the kindest and most humanistic way. He is greatly missed.

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