

## Obituary

### Reinier Plomp, 1929–2022

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**Reinier Plomp**, professor emeritus of experimental audiology at the Vrije Universiteit Amsterdam, The Netherlands, and Fellow of the Acoustical Society of America, passed away on

January 21, 2022. His research interests ranged from basic issues on tone perception to speech recognition in noise by the hearing impaired. *The Journal of the Acoustical Society of America* was his favorite vehicle for publishing his research, with over 50 articles over 40 years.

After graduating from the Department of Physics, Technical University Delft, The Netherlands, in 1953, Reinier joined the Institute for Perception of the Dutch research organization TNO. In his PhD thesis, *Experiments on Tone Perception* (1966), Reinier provided a thorough historical overview of the then-current theories on hearing that were supplemented with new experiments. This included studying the role of frequency resolution in perceiving the pitch of complex tones, as from musical instruments, even after elimination of the fundamental frequency. In a now-classic experiment, Reinier measured the perception of pitch change when applying small frequency changes to individual harmonics of a complex tone. He concluded that the pitch was not determined by the fundamental frequency but essentially by the frequencies of a few lower harmonics. The citation history of Reinier's early publications indicates that these still inspire many colleagues worldwide.

Reinier was strongly motivated by the ideas of the German scientist H. L. F. von Helmholtz in his approach to his research. But Reinier was also impressed by the experimental approach of many American psychoacoustic researchers. In this way, he became a moderator of a transatlantic exchange of ideas in hearing research. In 1969, Reinier organized a meeting, Symposium on Frequency Analysis and Periodicity Detection in Hearing, bringing together researchers from the United States and Europe to discuss psychoacoustical and electrophysiological data on hearing. The proceedings, edited by Plomp

and Smoorenburg, were published in 1970. Since then, similar symposia became an international tradition every three years, and they continue even now.

In 1972, Reinier was appointed professor of experimental audiology at the Vrije Universiteit Amsterdam where he focused on the effects of noise on speech communication, especially for the hearing impaired. He developed measuring tools and procedures to quantify the degree of communication handicap resulting from hearing impairment. He also developed a model to describe the effect of noise on speech intelligibility with two main components: *audibility* (or simple attenuation) and *distortion* (loss of the quality of the signal). This approach was followed in the development of the hearing in noise test (HINT) by Sig Soli and still plays an important role in current tests on speech communication.

In a paper focusing on auditory rehabilitation (1988), Reinier took a position against the general trend of applying fast multichannel compression in hearing aids. Thereupon, with several PhD students, Reinier studied the admissible reductions of spectral and temporal modulations in speech without damaging intelligibility as well as the limits of permissible changes in the spectral slope. Based on these studies, he advocated for slow-acting automatic gain control to keep the speech signal within the limited dynamic range of the hearing impaired.

Reinier is survived by his wife Rita.

#### **Selected Publications of Reinier Plomp**

- Plomp, R. (1964). The ear as a frequency analyzer. *The Journal of the Acoustical Society of America* 36, 1628-1636.
- Plomp, R. (1978). Auditory handicap of hearing impairment and the limited benefit of hearing aids. *The Journal of the Acoustical Society of America* 63, 533-549.
- Plomp, R. (1986). A signal-to-noise ratio model for the speech-reception threshold of the hearing impaired. *Journal of Speech and Hearing Research* 29, 146-154.
- Plomp, R. (2002). *The Intelligent Ear: On the Nature of Sound Perception*. L. Erlbaum Associates, Mahwah, NJ.

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