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STATISTICS OF SUBJECTIVE ASSESSMENT OF SOUND: DETECTION OF OUTLIERS AND EVALUATION OF THEIR CONTRIBUTION

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Abstract. The subjective evaluation of noise perception plays an important role in decision making in many applications in the field of acoustics, such as the evaluation of noise perception (annoyance) in communities located near airports and studies on traffic noise, product sound quality, environmental land soundscape, sleep disturbance and hearing protector noise attenuation. The subjective perception of noise by a group of human evaluators is usually associated with a large variability, as observed through the value for the standard deviation. This large variation between subjects is due to their variability in terms of their experience, attitudes and expectations, age, personal state of mind, sensitivity to noise, fear of harm connected with the source, personal evaluation of the source, coping capacity with respect to noise, trust in or the misfeasance of relevant authorities, and a history of noise exposure, among other factors. Some subjects pay greater attention to the assessment and provide a more accurate response while others may not concentrate properly on the task and may perform the evaluation simply for the payment they receive. In general, a small amount of the subjects give responses which differ from that of most of the other subjects. These few subjects tend to have a considerable influence on the final results and are the main source of the high standard deviation. Thus, they will be considered herein as “outliers”. This is a very broad topic which has extensive application in the field of acoustics.

Keywords: sound perception, outliers.

References

- [1] *Outliers in Statistical Data*, Second Edition, Vic Barnett and Toby Lewis, John Wiley & Sons, 1994.
- [2] B. Efron; Bootstrap Methods: Another Look at the Jackknife, *Ann. Statist.* Volume 7, Number 1 (1979), 1-26.
- [3] Van Kempen EEMM, Van Kamp I. *Annoyance from Air Traffic Noise. Possible Trends in Exposure-Response Relationships*. RIVM; Bilthoven, The Netherlands: 2005. Report 01/2005 MGO EvK, Reference 00265/2005.
- [4] Miedema HME, Oudshoorn CG. Annoyance from transportation noise: Relationships with exposure Metrics DNL and DENL and their confidence intervals. *Environ. Health Perspect.* 2001;109:409–416.
- [5] Dirk Schreckenber, Markus Meis, Cara Kahl, Christin Peschel, and Thomas Eikmann; Aircraft Noise and Quality of Life around Frankfurt Airport, *Int J Environ Res Public Health.* 2010 September; 7(9): 3382–3405.
- [6] ANSI S12.6- 2008 - Methods for Measuring the Real-Ear Attenuation of Hearing Protectors.
- [7] ISO 4869, 1-5, Acoustics -- Hearing protectors.