

*Sten Ternström: Mapping Phonatory Dynamics*

Session: Cutting Edge, Saturday 4 Sept, 15:22 - 15:42

**Abstract**

The sounds of the human voice are famously expressive, because they exhibit so much variation - across individuals, across the range of the voice and across vocal health status. Hence it is important that quantifications of vocal status be based on measurements that are known to be truly representative of the current status of the patient. For instance, most metrics co-vary with  $f_0$  and SPL, and these variables are rarely sufficiently controlled for. The conventional sampling of vocal status from a small number of sustained vowels is pragmatically motivated, but in relation to the intra-individual variation, it is often inadequate, and this is one reason why objective voice measurements often have weak evidential value. New technology has enabled dense mapping of voice metrics across any relevant range of the voice. Voice map images can be constructed that characterize a voice more comprehensively, thereby providing a context in which point observations may be interpreted. Such maps always show that variation over  $f_0$  and SPL is highly personal. However, the variation is consistent within subjects: on repeated trials of the same task, a given person with unchanged vocal status will produce very similar voice maps. It follows that intra-subject comparisons of voice maps across interventions are valid. Here I will give some illustrative examples of the above observations, for both running speech and for the full voice range. A general voice map method is described for obtaining values of any scalar metric that are representative of the subject's running habitual speech. We will also look briefly at why conventional null-hypothesis significance testing is particularly unsuitable for assessing the clinical importance of voice map data.