

Speak up please: towards stimulating vocal effort changes in the recording of suspect material

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A situation frequently encountered in forensic casework is where the material from the unknown speaker and the one of the suspect are spoken with different levels of vocal effort (=vocal loudness). Vocal effort has an influence on a variety of phonetic parameters that are employed in voice comparisons. Probably most important of all the parameters affected by vocal effort is fundamental frequency, which is known to rise when vocal effort is increased. Frequently, the speech of the unknown speaker is produced relatively loudly (at least some of the time), whereas the suspect speaker speaks more softly. In a situation like that – and as long as vocal effort is not used as a speaker parameter in its own right – it is scientifically and ethically sound if the suspect is requested or stimulated in some way to use approximately the same vocal effort level that was used in the speech material of the unknown speaker. Experience has shown that the standard method of asking the suspect to speak up rarely works efficiently; the speaker then often forgets (or chooses to ignore) this instruction after a short while, at which point vocal effort returns back to normal, or s/he does not reach any higher vocal effort levels to begin with.

The question that arises from a situation like that is whether a practicable method can be found that operates on a less conscious and more “physiological” level than the instruction method – hoping that with such a method more stability over time, less susceptibility to uncooperative behaviour or the loss of memory (of an instruction), and a wider variety of vocal effort levels can be achieved. In this paper three cases are presented, each of them highlighting one or more methods for the stimulation of vocal effort changes.

In the first case the recording of a suspect sample was scheduled to take place as part of a court session. In that session a “mobile” Lombard experiment was carried out. The technology and results of this experiment will be presented. In the second case increased loudness was achieved by the distance method (cf. Traunmüller & Eriksson, 2000). More intense changes in vocal effort, however, came about naturally, when the suspect was confronted by the investigator for his strikingly uncooperative behaviour and then burst out into anger. In the third case the goal was to stimulate the suspect to speak on a level below, rather than above normal. To achieve this goal, meter readings in combination with “sidetone amplification” (Siegel & Pick, 1974) were used.

The degree of success and the theoretical implications of these methods will be discussed. For example, although in the first case an increase in vocal effort was achieved, the size of the change was only moderate, which is relevant to the question whether and in what ways the Lombard effect can be voluntary inhibited (cf. Pick et al., 1989).

References

- Pick, H.L. et al. (1989). Inhibiting the Lombard effect. *J. Acoust. Soc. Am.*, **85**, 894–900.
- Siegel, G.M. and H.L. Pick (1974). Auditory feedback in the regulation of voice. *J. Acoust. Soc. Am.*, **56**, 1618–1624.
- Traunmüller, H. and A. Eriksson (2000). Acoustic effects of variation in vocal effort by men, women, and children. *J. Acoust. Soc. Am.*, **107**, 3438–3451.