

## Quality Dimensions of Narrow-Band and Wideband Telephone Connections

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Telephone connections in wideband networks differ from standard ones in that the spectrum of the transmitted speech is no longer limited to the 300-3400 Hz range (now limited e.g. by the user interface and the used codec), and that the connection may show time-varying characteristics (e.g. due to packet loss, voice activity detection, echo cancellation, or noise-reduction algorithms). These physical characteristics result in different perceptual dimensions when the transmitted speech signals are received by the human listener, and judged with respect to their quality.

It is the aim of this contribution to analyze the perceptive quality dimensions of such modern telephone connections. Two initial experiments are described addressing connections with different transmission bandwidths, user interfaces, codecs, types of noise, and noise-reduction algorithms. The first one, a multidimensional scaling experiment, allowed perceptual dimensions to be identified in an unbiased way. Four perceptual dimensions were extracted which seem to be stable across speakers. These dimensions were labelled “directness”, “interruptedness”, “frequency content” and “noisiness”. The second one, an absolute category rating experiment, allowed the relevance of the extracted dimensions for overall quality to be determined. External preference mapping showed that the first two dimensions account for about 70% of the variance in the overall quality judgments. So far, the experiments were limited to narrow-band connections, but generalizations towards wideband channels are pointed out.