SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

To clarify the relationship between speech privacy and intelligibility using a new method for directly evaluating speech privacy.

DESIGN IMPLICATIONS

Spaces such as patient-doctor consultation rooms should be designed with a degree of soundproofing so that sensitive conversations do not leak out of the space; such compromises to speech privacy can have negative effects on both patients and people nearby within the hospital. At the same time, attention should be given to the reduction of ambient hospital noise in general, as this study showed that participant dissatisfaction increased correspondingly with increasing background noise levels, even as the volume of overheard speech remained the same.

Subjective evaluation of speech privacy at consulting rooms in hospitals: Relationship between feeling evoked by overhearing speech and word intelligibility score

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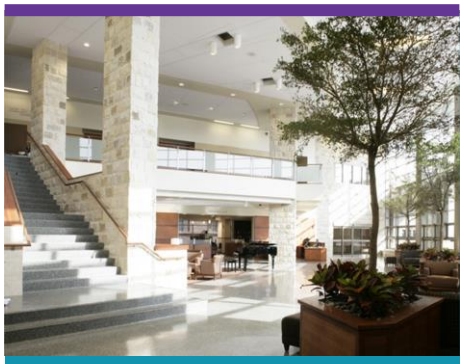
Key Concepts/Context

Healthcare environments, particularly patient-doctor consulting rooms, are often filled with conversations of a sensitive nature that ideally should be kept private for the well-being of both patients and nearby individuals. Previous studies and relevant standards within healthcare environments have often used speech intelligibility as a subjective measure for assessing speech privacy. The authors of this study argue that the methods used in these previous studies and standards require evaluators to already have a firm grasp on what truly defines speech privacy. Their stance is that the concept of speech privacy in healthcare environments is not commonly known to ordinary people within public spaces. By clarifying the differences between the concepts of and relationship between speech intelligibility and speech privacy, future studies and standards may be better able to assess levels of safety and privacy within healthcare environments.

Methods

In the first part of the study, the authors used a questionnaire to investigate the feelings evoked in participants after overhearing a hypothetical conversation. 245 respondents took part in this questionnaire, which instructed the participants to assume they were overhearing a conversation between a doctor and patient while sitting in a waiting room adjacent to a hospital consulting room. The questionnaire provided seven possible feelings evoked by the situation that the participants were asked to choose from. In the second part of the study, a subjective listening test was conducted to focus on the feelings reported in the questionnaire in relation to speech privacy. A staged recording of a conversation between a doctor and a patient discussing health issues of a sensitive nature was played over a speaker



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system, coupled with simulated background hospital noises. Participants were instructed to adjust the sound pressure level (SPL) of the patient-doctor dialogue to the maximum volume possible before feelings of dissatisfaction were evoked. In the final part of the study, the authors investigated the relationship between the feelings of dissatisfaction and the word intelligibility associated with the speech volume obtained from the previous data.

Findings

Participants of varying ages and genders and with differing experiences in previous hospital visits all expressed substantial feelings of dissatisfaction when placed in the hypothetical situation of overhearing a speech between a doctor and patient in a consulting room. During the listening test, 80% of participants did not require that the simulated conversation be completely inaudible, and the threshold of the feeling of dissatisfaction depended largely on a given participant's sensitivity to the leakage of personal information through conversation. When a speech-to-background-noise ratio was kept at -15 dB, the threshold of dissatisfaction was suppressed for about 80% of participants. Ultimately, the threshold of dissatisfaction corresponded to a word intelligibility score of around 10-20% for participants with average sensitivity, and the ratio of patients feeling dissatisfied increased as background noise increased, even as speech intelligibility remained the same.

Limitations

This study was conducted using questionnaires and simulated listening scenarios, thus no research was conducted in an actual hospital environment. The hearing abilities of the participants themselves were not gauged prior to the study. All questions and scenarios posed to participants were hypothetical and largely required the use of the participant's imagination, which may have produced results different from real-life scenarios.

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