Can water sounds improve work spaces?

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Can Water Sounds Improve Work Spaces?

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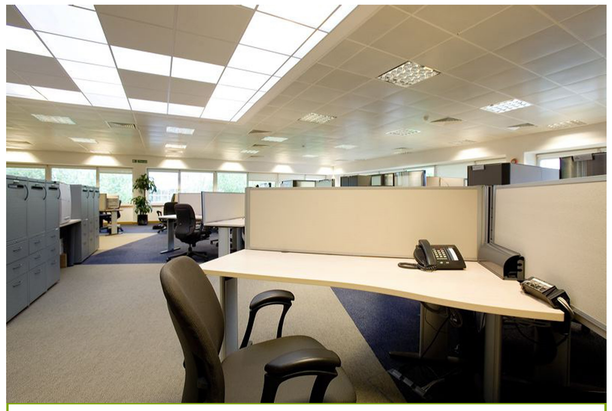
1 Introduction

Conventional noise control methods attempting at reducing noise levels are inefficient and costly

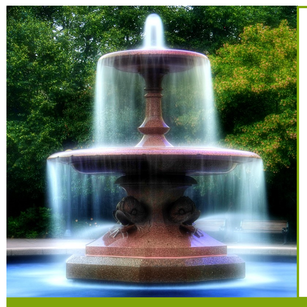
This study makes use of pleasant sounds as an innovative and cost effective solution for masking noise.

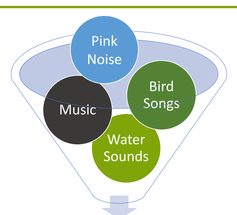
- The research attempts at masking irrelevant speech in open plan offices through the use of water generated sounds.
- The research focuses on the auditory and visual effects of different water feature designs inside open plan offices.



Why open plan offices?

- High level of noise complain in open plan offices.
- Irrelevant Speech has consistently been addressed as the most annoying source of noise
- Workers in open plan offices are the listeners and the noise sources at the same time, therefore, conventional noise control methods, aiming at reducing the noise level, would limit functionality.





Water sounds
+ Efficient masker
+ Pleasant

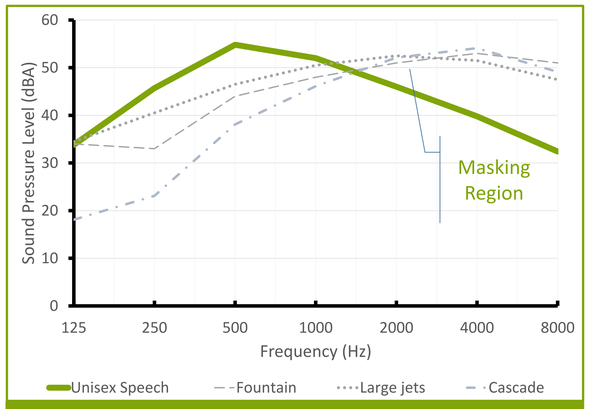
Why Water Sounds?

Several sounds have been used in past studies e.g. pink noise, bird songs, music and songs. However, only water sounds are capable of providing masking and creating a pleasant environment.

2 Why Real Water Features?

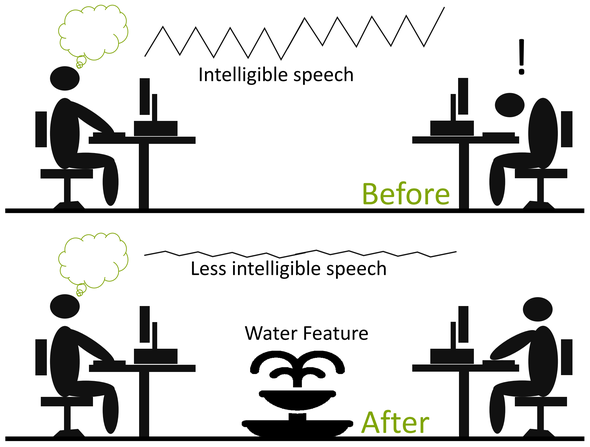
- To bring back nature into the built environment.
- To exploit the positive effect of water features' visual stimuli in providing peacefulness and relaxation.
- Matching the visual and acoustic stimuli with each other.
- People cannot simply be deceived.

Visual Stimuli + Acoustic Stimuli = Higher Preference



How does it work?

The water sounds are expected to mask higher frequencies (Consonants) which carry most information in human speech, and draw listeners attention away from the irrelevant speech noise, hence, the listener will physically hears less intelligible speech and psychologically feels better.



3 How?

The research hypothesises that speech privacy and relaxation will be increased through the use of water generated sounds. This hypothesis will be tested using:

- Subjective speech privacy tests.
- Physical measure of speech intelligibility (Speech Transmission Index (STI)).

Preference

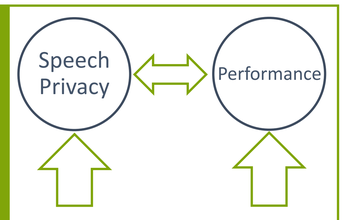
The most preferred water features will be identified in terms of:
- Speech privacy
- Peacefulness
- Visual preference

This will be performed using :
- Paired comparisons
- Semantic scale
- Brain imaging techniques

Performance

Improvement in performance for several clerical tasks will be investigated.

It is expected that when speech privacy increases, performance will increase too.

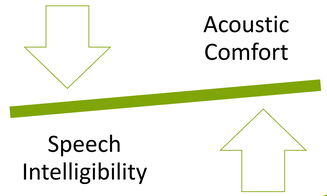


4 Impact

The two major impacts of the study are:
- Psychological impact
- Economical impact

Psychological Impact

The study aims at increasing speech privacy (reducing intelligibility) inside work spaces, which raises the comfort level of the workers (goose) and subsequently increases their performance level (golden eggs)



Economical Impact

Performance of some clerical tasks is expected to increase by up to 7% or even more for memory based tasks. Estimation shows that if performance increases by only 1%, the amount of saving will be around £180/worker/year. This yields a payback period of less than one year for an open plan office having 20 workers.

1% Increase in performance → **£180** saving per worker per year → **One Year** Payback period

Any Further Impact?

- The results are not restricted to open plan offices and will be applicable to any space where speech privacy is needed.
- Offers a better understanding on how people perceive there acoustic environment.
- Helps to understand why some sounds are preferred to others.
- May increase thermal comfort by increasing the relative humidity.
- Thermal comfort might be deteriorated where the relative humidity of the air is already high.