

Room acoustics

In open space office solutions



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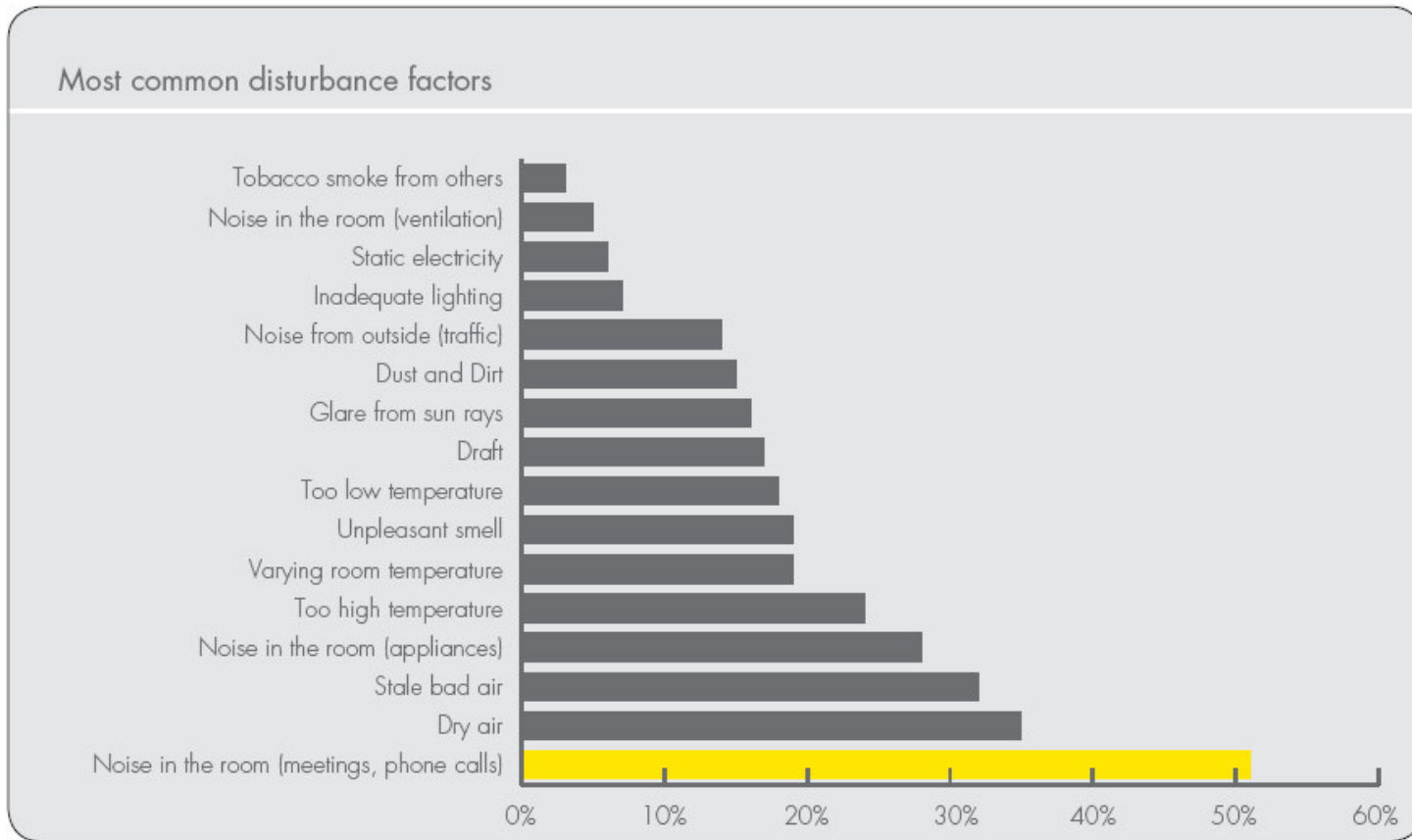
A SOUND EFFECT ON PEOPLE

The physical aspects of comfort

- Air quality
- Lighting
- Temperature
- Acoustics
- Layout



Disturbances



Interruptions = lost performance and time

-Long time to 'get mind back on track'

-Recalibration

-Stress



* Jonsson, "Ten thoughts about time"

Research: Evans et al, Cornell University (2000)

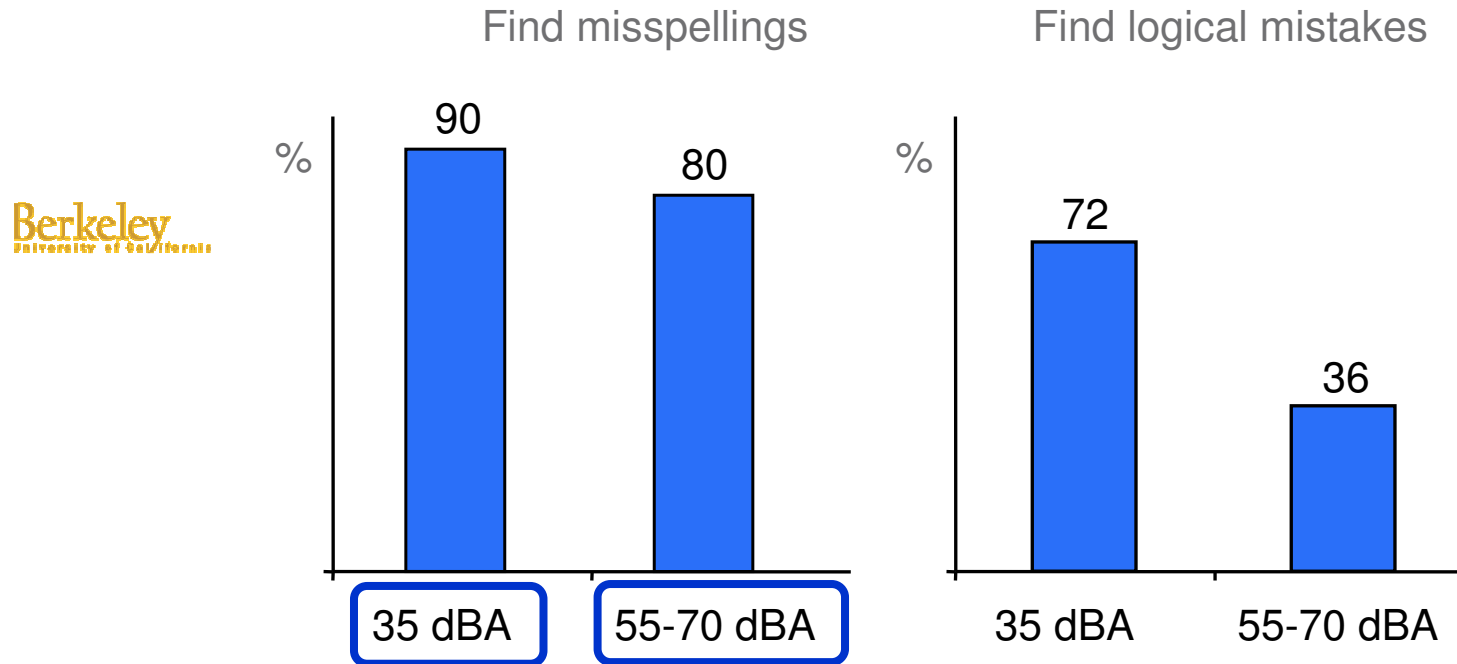
Office workers in a noisy environment....

- Are less likely to make postural changes
- Make fewer attempts at solving difficult tasks
- Experience elevated levels of epinephrine

"Uncontrollability of sound rather than its intensity is what makes it stressful"



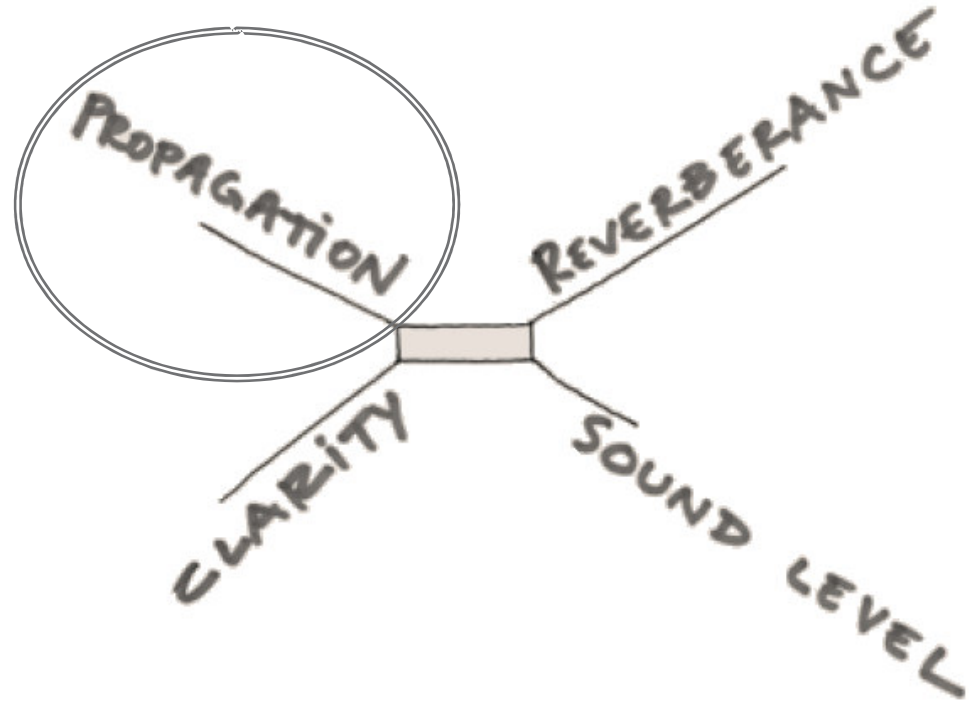
Research: Weinstein, University of California, Berkeley (1974)



Intellectual performance is enhanced in a good sound environment

Sound is multidimensional

- The 4 dimensions of sound

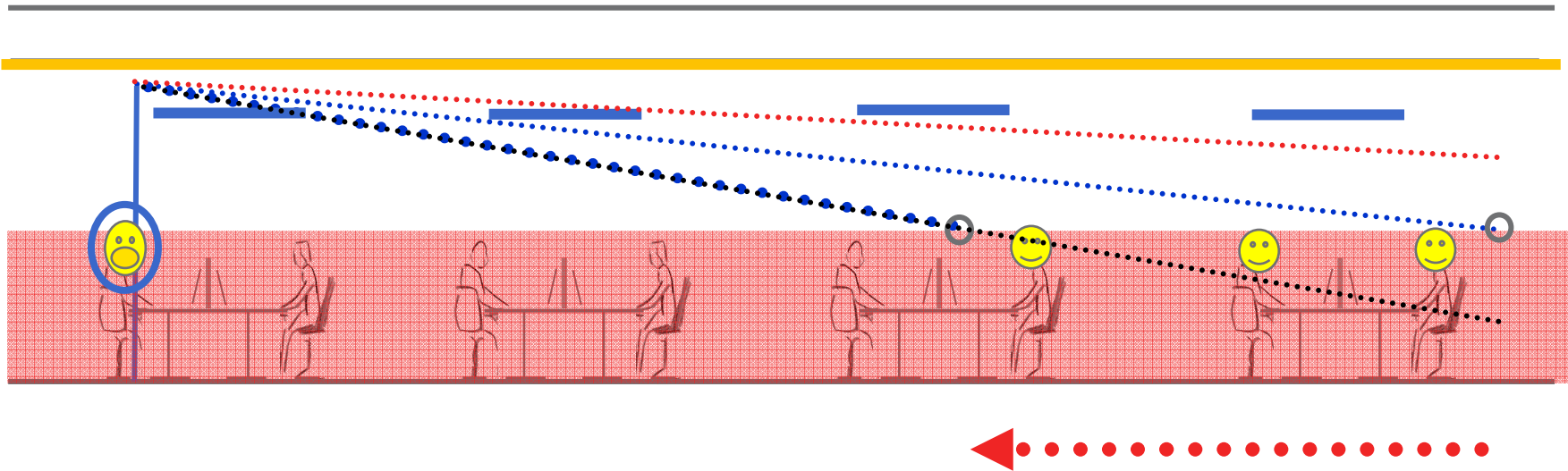


Sound propagation in open-plan offices

Regular absorption

Low absorption

More absorption



Lower Sound Propagation 😊

Vattenfall Helpdesk, before refurbishment



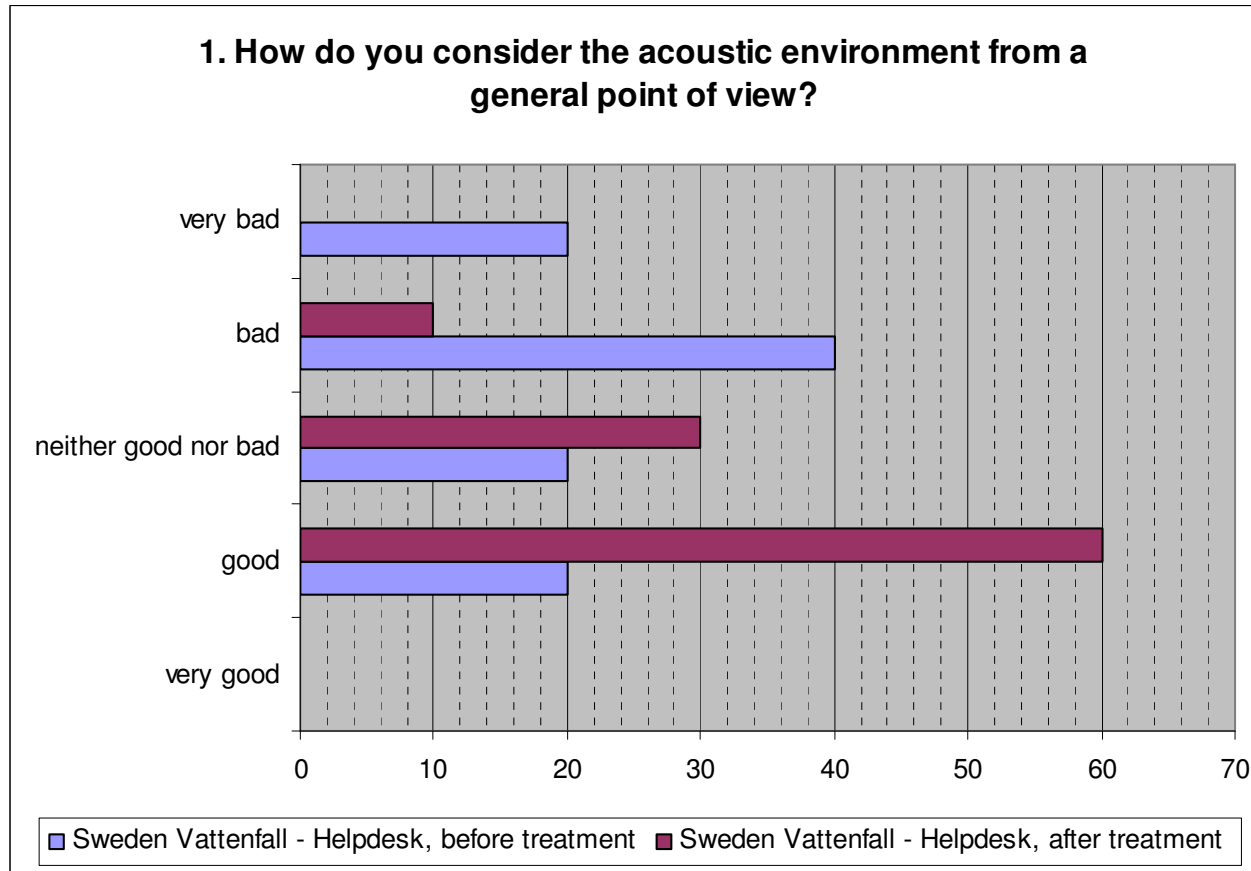
* Nilsson et al, Acoustic design of open-plan offices (NiCe)

Vattenfall Helpdesk, after refurbishment



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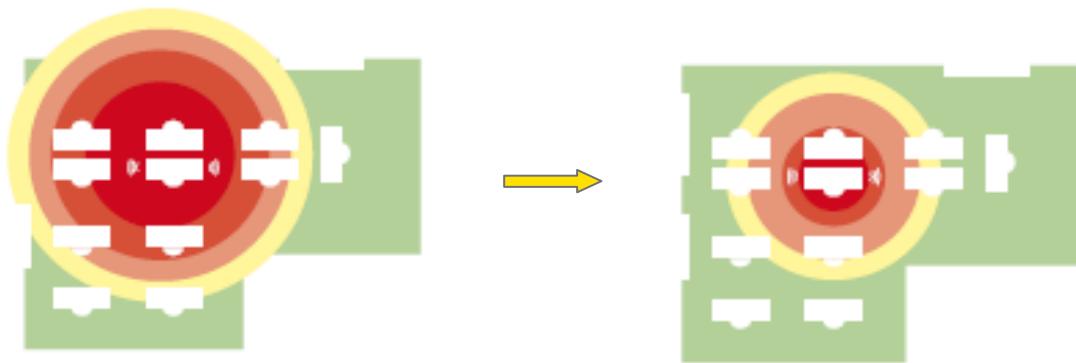
Vattenfall Helpdesk – subjective experience



* Nilsson et al, Acoustic design of open-plan offices (NiCe)

Sound Propagation <-> Articulation Class (AC)

- Measure for rating an absorber's effectiveness in *limiting sound propagation*
- The *higher* an absorbers **AC**, the *shorter the sound* will travel in the room
- ASTM E1110 / E1111
- For open spaces, absorbers with **AC > 180**



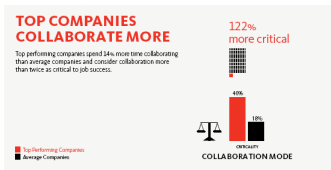
5 key steps for sound design of offices



1. Minimise sound propagation



2. Place people in the right teams



3. Inform about the benefits

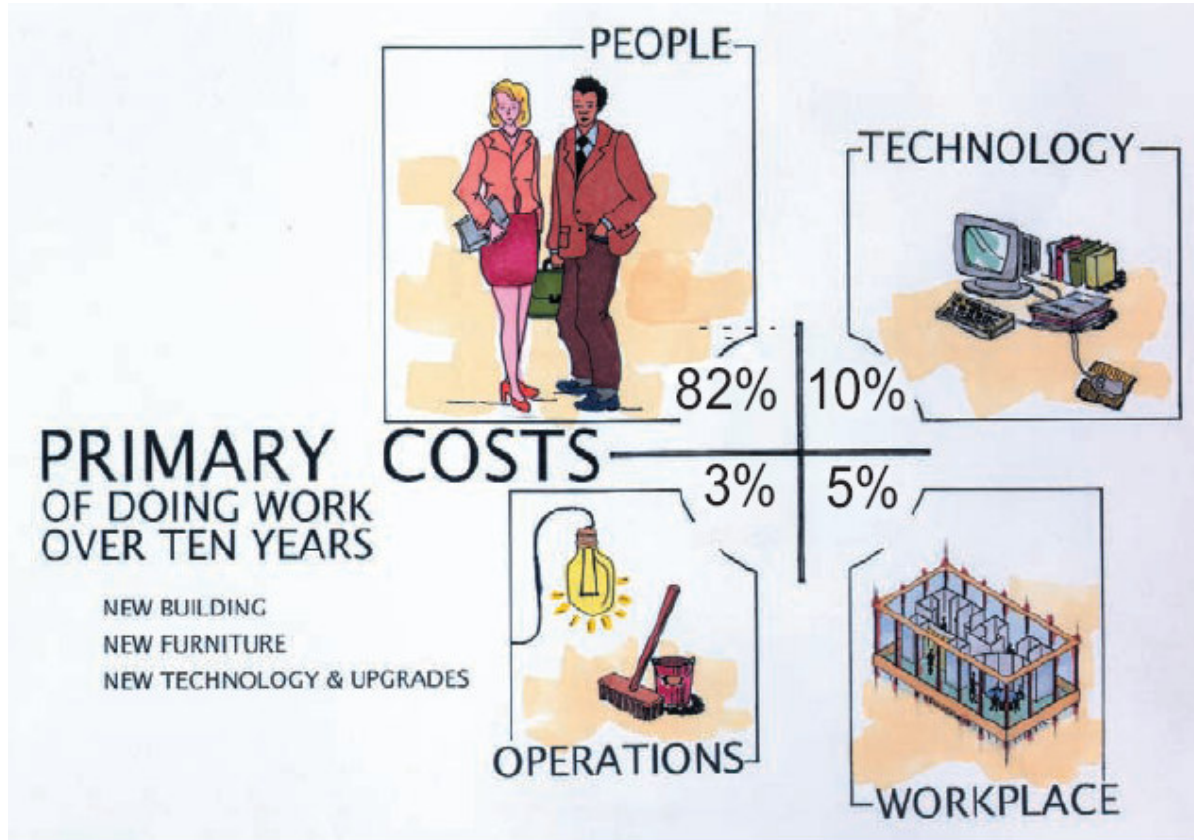


4. Establish acoustical etiquette



5. Include enough silent rooms

Success is in the people



**Brill et al, BOSTI Research*

Enhanced performance with enhanced conditions

