



# WELCOME

Thank you for joining. The event will begin shortly

For the enjoyment of others, and to support the smooth running of the event, **please mute your microphone during the call unless you are speaking.** If you missed connecting to the audio when you joined, please click on *Audio & Video* in the upper part of the screen.

In case of technical questions, you can contact the host privately using the chat function

## **Aims of the 1947 Club**

- Furtherance of Social and Professional Contacts
- Providing assistance to Branch RICS Matrics
- Preservation of the history and tradition of the 1947 Club

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Jack Harvie-Clark

# Advances in acoustic design for open plan offices

11<sup>th</sup> December 2020

 @JackH\_C



# About Apex Acoustics

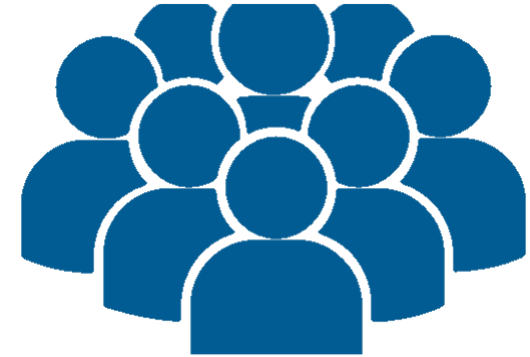
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2006



One of the largest independent acoustic consultancies in the UK



20 consultants



Three offices, work nationwide



# Jack Harvie-Clark

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- Open plan office acoustics since 2010
- Presenting conference papers since
- Organised OPO meetings
- ISO 22955 committee member
- WELL<sup>®</sup> Sound Concept advisor
- Past Chair of Association of Noise Consultants

# Workplaces have been failing people

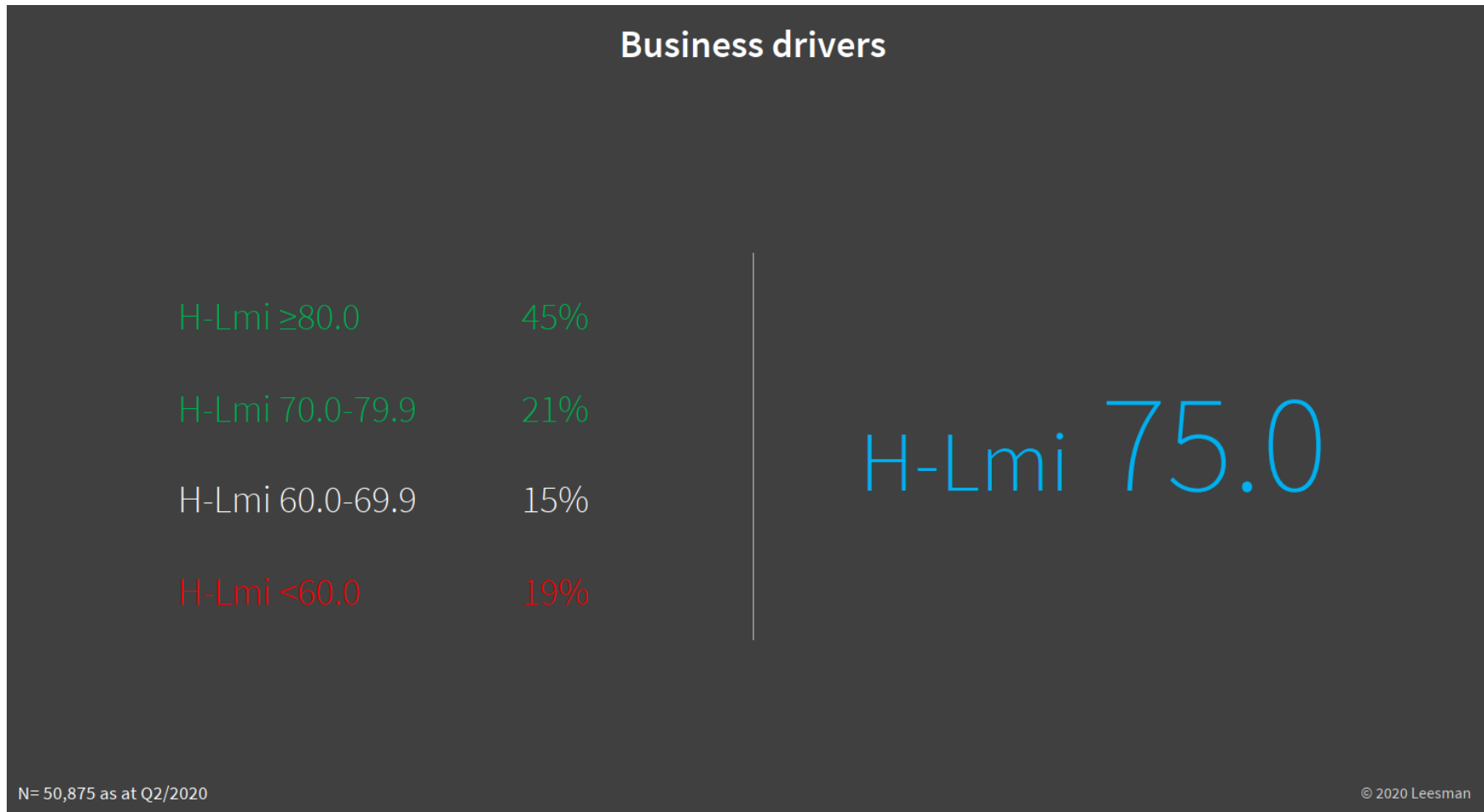
- 57% of people say workplaces enable productive work
- 1/3<sup>rd</sup> new workplaces deliver high performance
- **‘Noise levels’ most common challenge**
  - average satisfaction of 34 %
  - nearly half of workplaces < 30 % satisfaction

<https://www.leesmanindex.com/250k/>

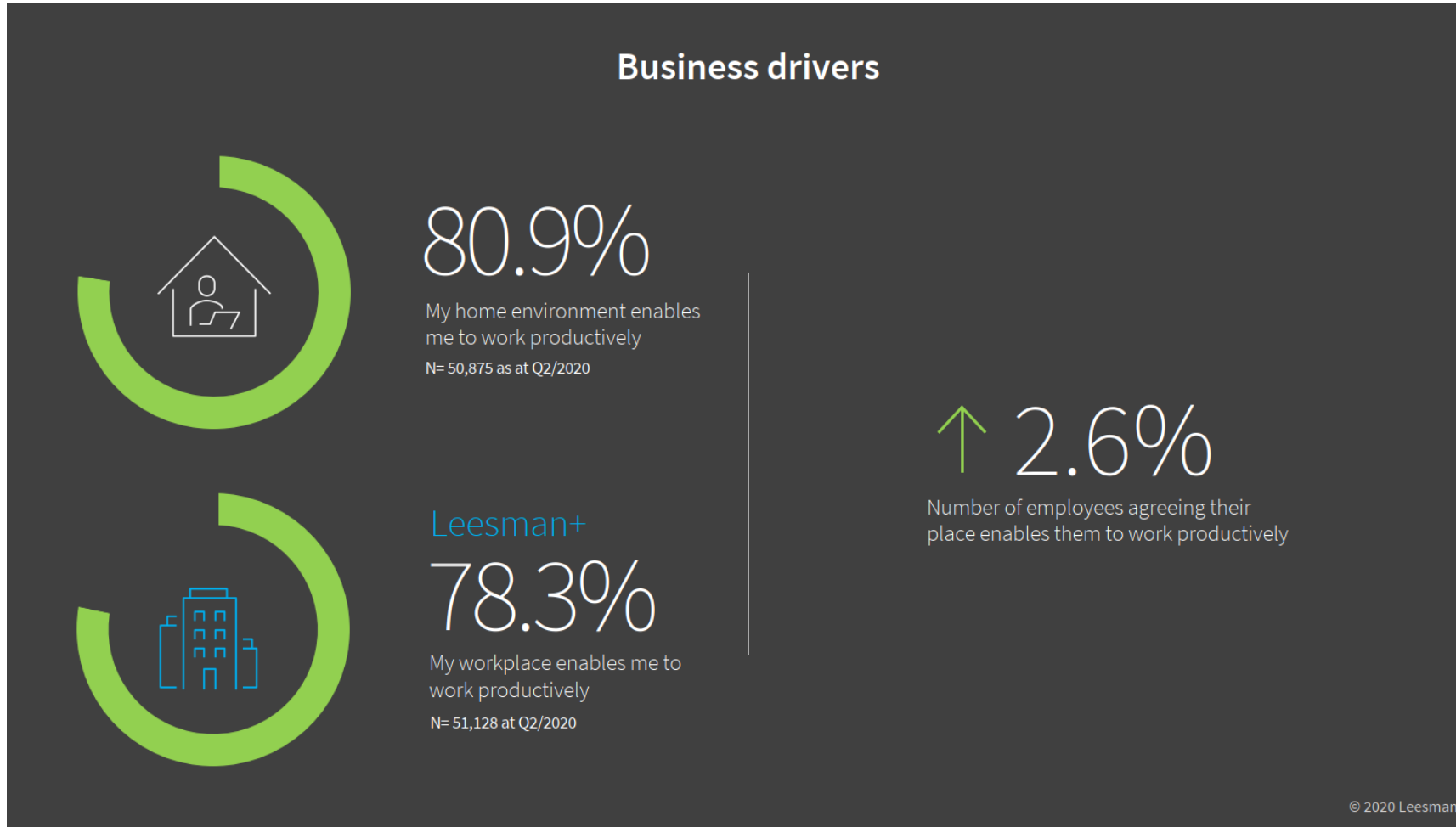


Organisations are not getting what they should from their corporate workplaces. This is the finding from research across 250,000+ employees in 2,000+ workplaces.

# Leesman Home Working survey – first 50k



# Leesman Home Working survey – first 50k



# From challenges to solutions



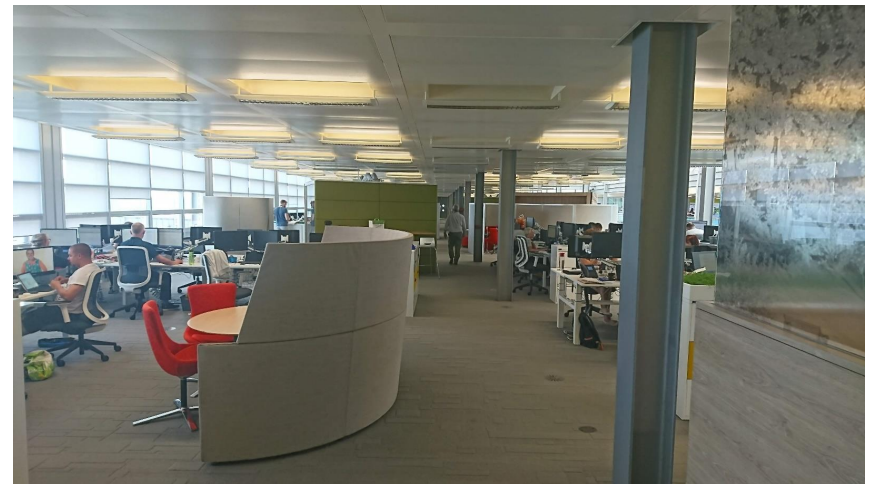
Quiet?



Monotonous?



Varied?



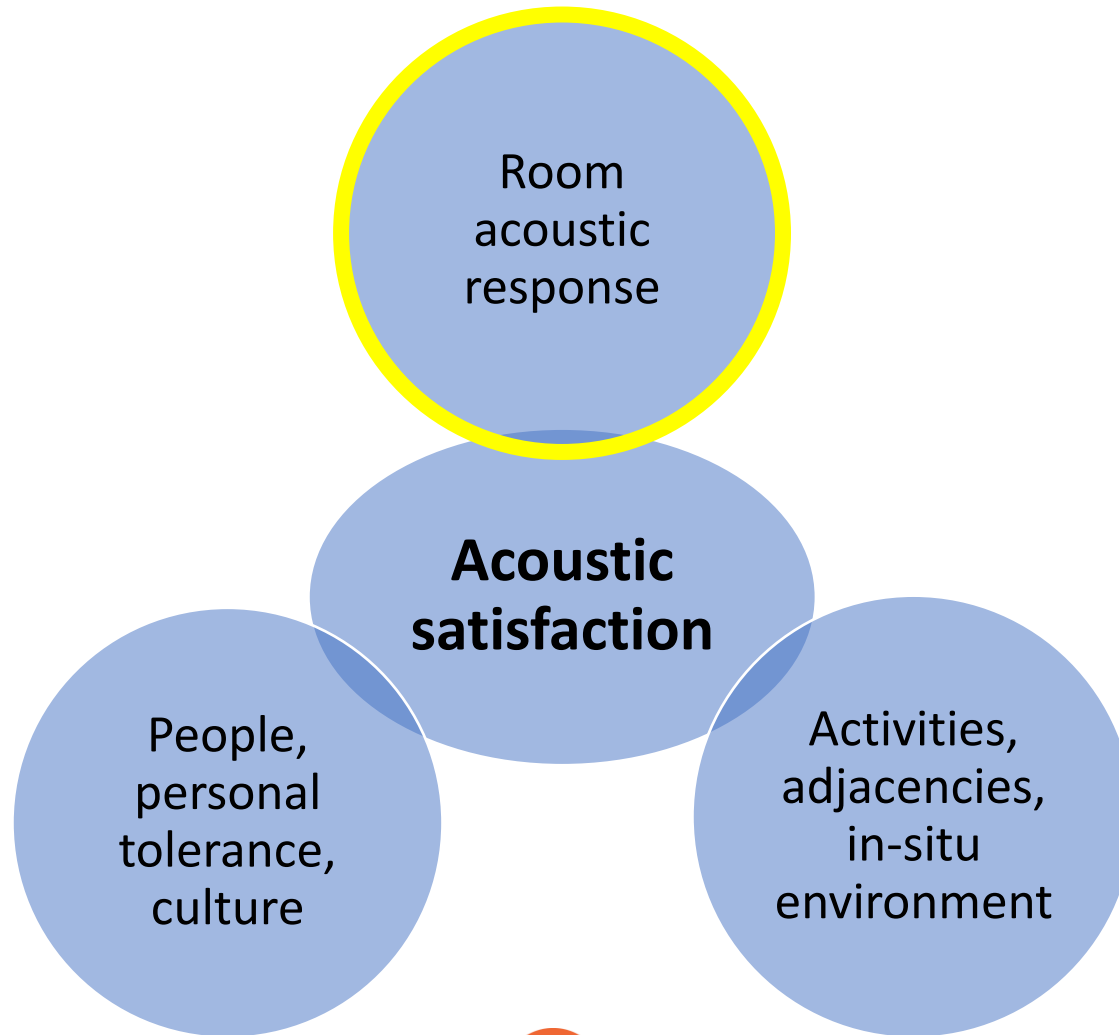
Vibrant?





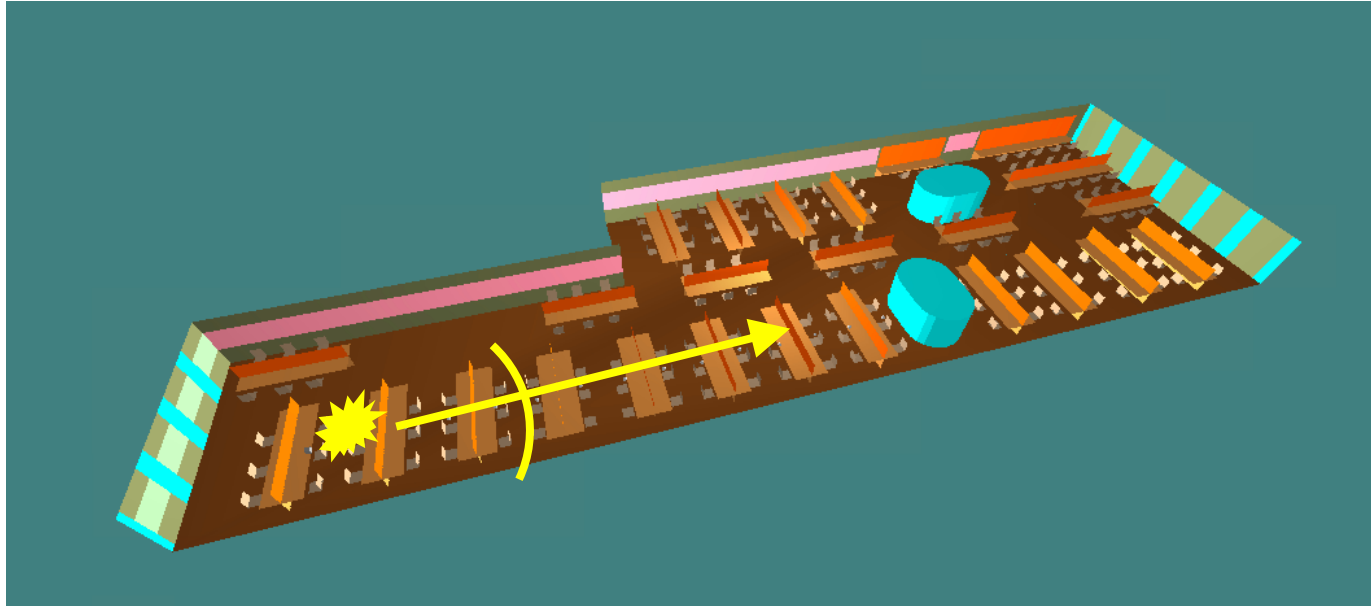
# Designing for acoustic satisfaction

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# Room acoustic response

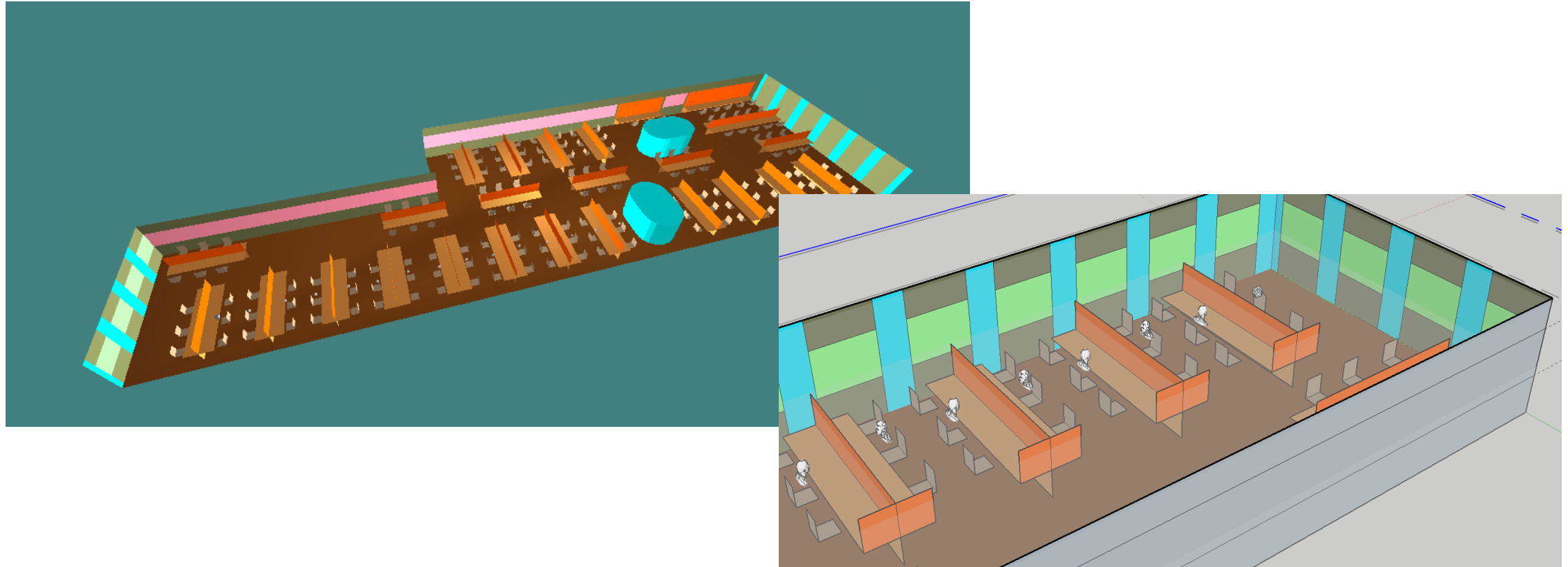
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[ISO 3382-3](#): 2012, Acoustics — Measurement of room acoustic parameters — Part 3: Open plan offices

# Implications for design

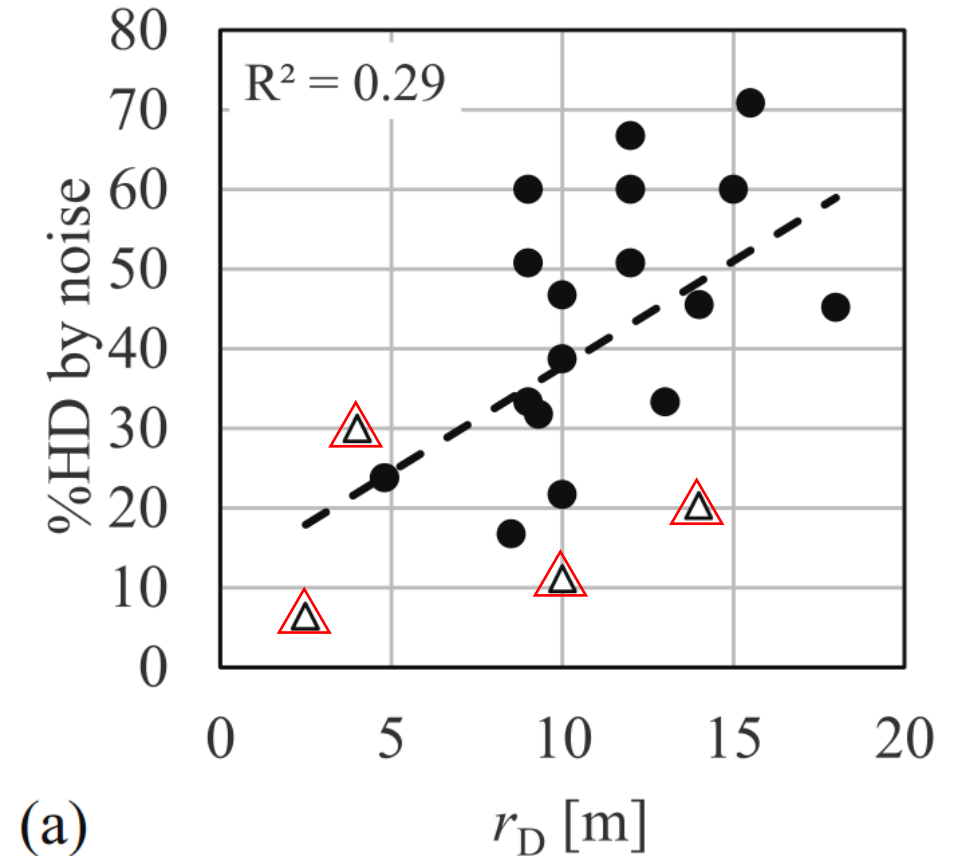
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[Contrasting Open Plan Office Design Implications from Emerging French, German and Finnish Standards](#) F Larrieu, J Harvie-Clark, ICSV24, 2017

# ISO 3382-3 indicators

*Distraction distance predicts  
perceived disturbance by noise*



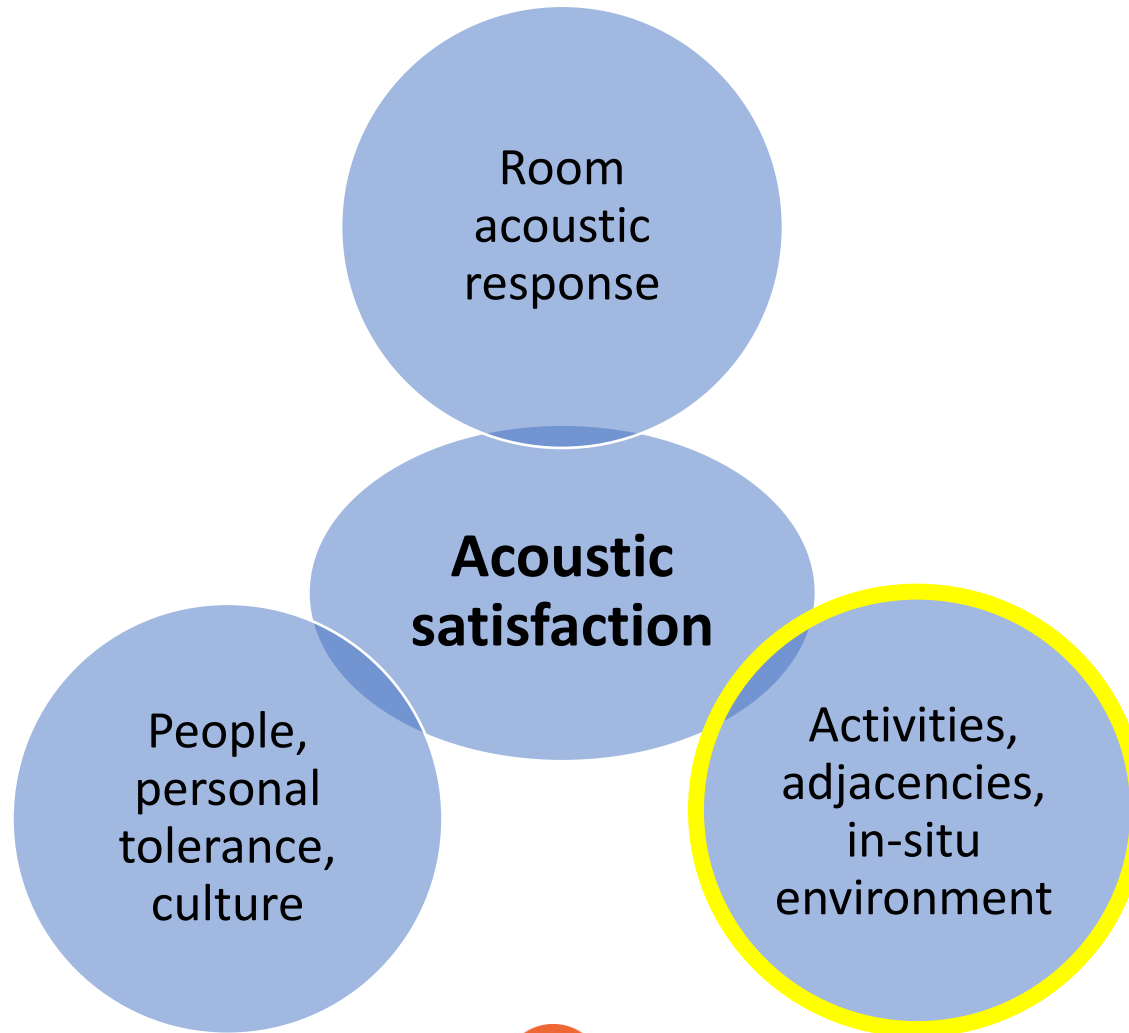
(a)

[Distraction distance and perceived disturbance by noise—An analysis of 21 open-plan offices](#)

A Haapakangas, V Hongisto. JASA, 2017.

# Designing for acoustic satisfaction

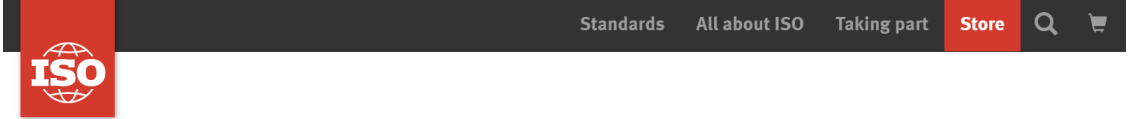
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# Different types of space activity

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- Call centre
- Collaborative work
- Individual work
- Combining activities



Standards All about ISO Taking part Store

ISO

ICS > 13 > 13.140

**ISO/DIS 22955**

Acoustics — Acoustic quality of open office spaces

<https://www.iso.org/standard/74237.html>

# Implications for design

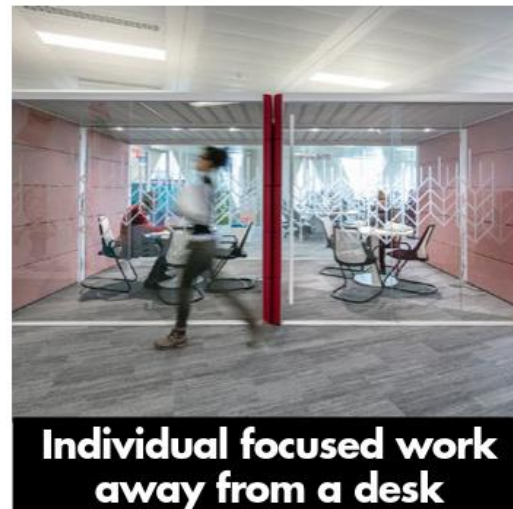
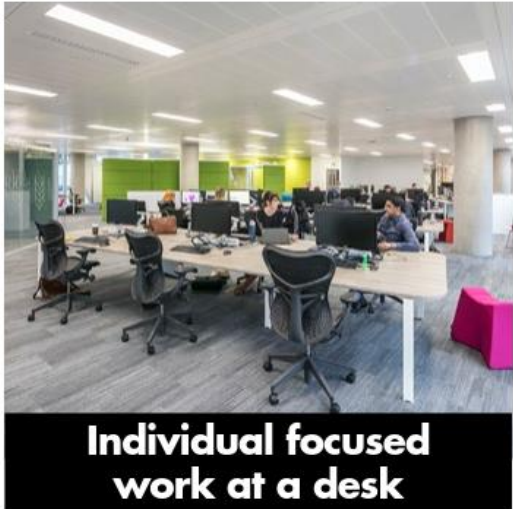
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Figure 1 – examples of measured variations of screens in an open plan office

[How ISO 3382-3 acoustic parameter values are affected by furniture, barriers and sound absorption in a typical open plan office](#), R Wenmaekers N Van Hout, ICA 2019

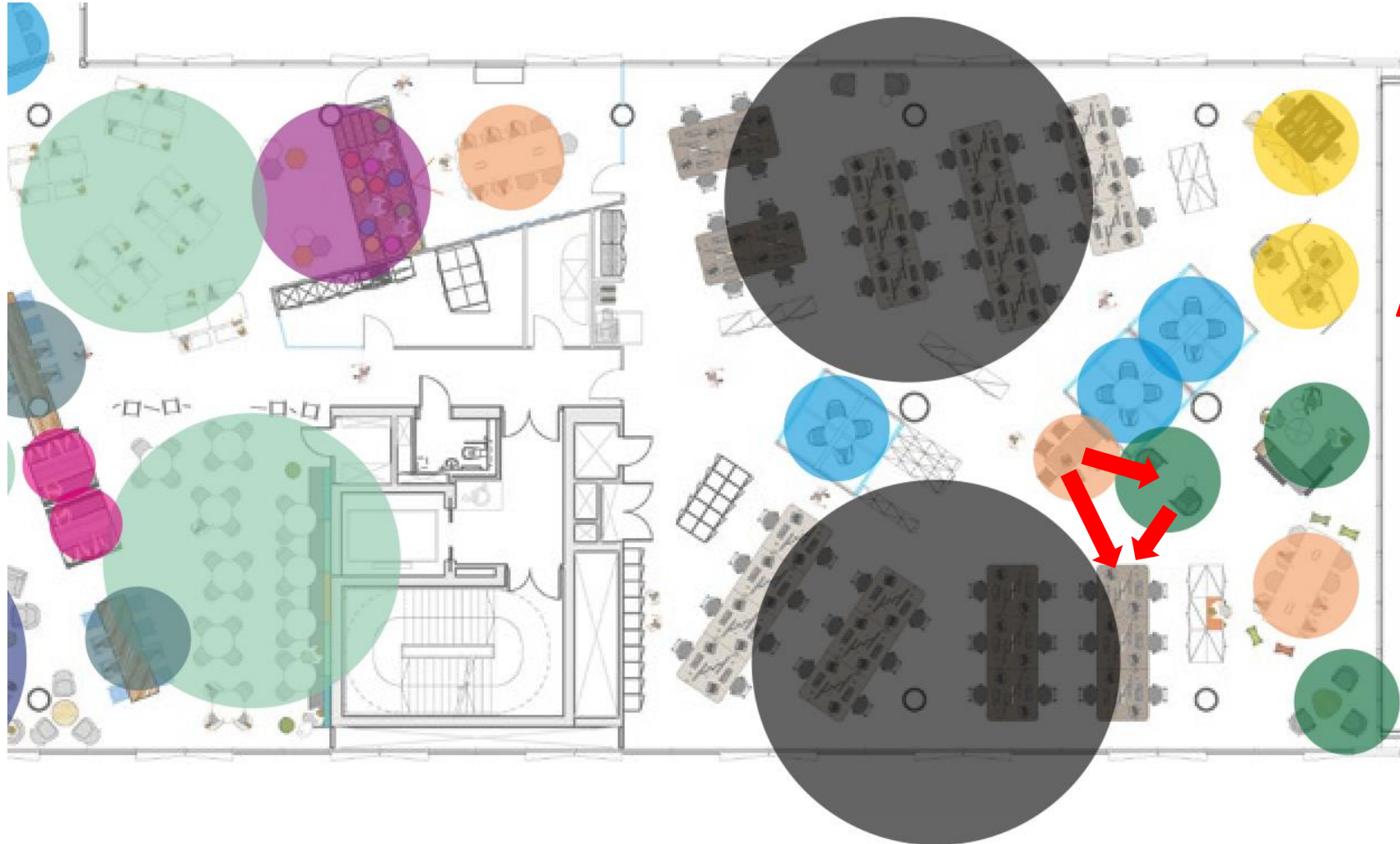
# Variety of activities – variety of acoustic needs



Source:  
<http://tskgroup.co.uk/news-knowledge-resources/activity-based-working>



# Variety of acoustic needs



**Acoustic description of the room is necessary but not sufficient**

Source:  
<http://tskgroup.co.uk/news-knowledge-resources/activity-based-working>

# New acoustic design method

ISO/DIS 22955:2019[E]

Increasing sensitivity



Source / receiver space type	Informal meetings (open plan)	Outside of the room communication (phone)	Collaborative	Non-collaborative	Focussed phone	Focussed individual work
Social and welfare	15	15	18	24	27	32
Informal meetings (open plan)	15	12	15	21	24	29
Outside of the room communication (phone)			12	18	21	29
Collaborative				18	21	26
Non-collaborative					18	23
Focussed phone					21	26



Table 6 - Potential  $D_{A,s}$  ratings between different types of spaces [4]

<https://www.apexacoustics.co.uk/new-method-for-acoustic-design-of-open-plan-offices/>

# Evaluating in-situ environment

- Point of view video
- Point of hearing audition

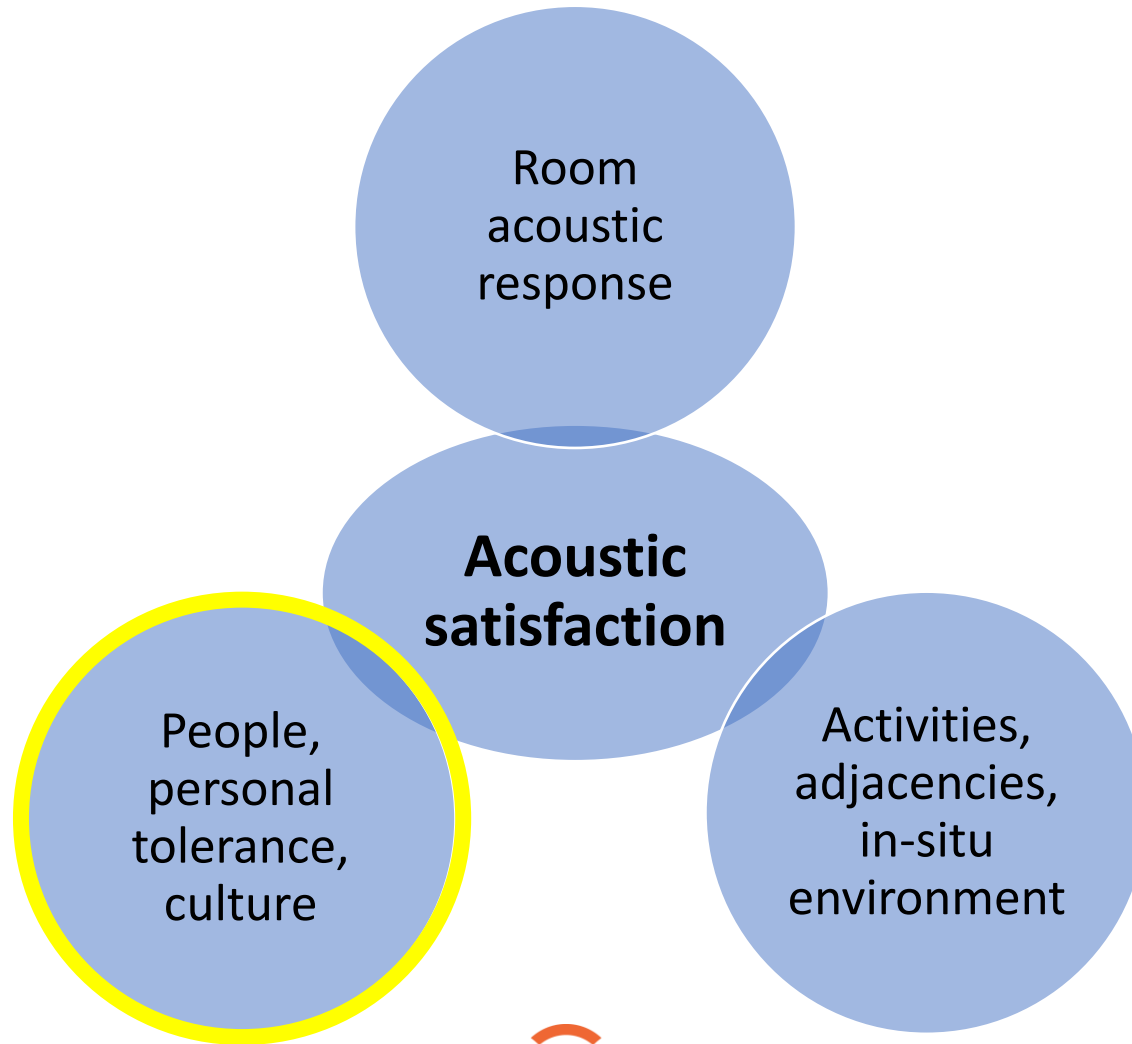


[The APEAL Method](#)  
Apex Acoustics, 2020



# Designing for acoustic satisfaction

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# Questionnaire: effect of noise on comfort

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- ISO 22955 Annexe



[Effect of noise on comfort in open-plan offices: application of an assessment questionnaire](#)

N Perrin Jegen, P Chevret, Ergonomics, 2017

# How do people cope?

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- Avoidance strategies most common
- Approach strategies most effective
- ISO 22955 Annexe on etiquette

[How office workers cope with distraction by sounds in the open plan office](#)

S Steps et al, ICA 2019

# Noise cancelling headphones

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[Influence of active-noise-cancelling headphones on cognitive performance and employee satisfaction](#)

B J Muller, A Liebl, N Martin, ICA 2019

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# Personal Office Preferences

## Personal Office Preferences: Full Report and Detailed Analysis

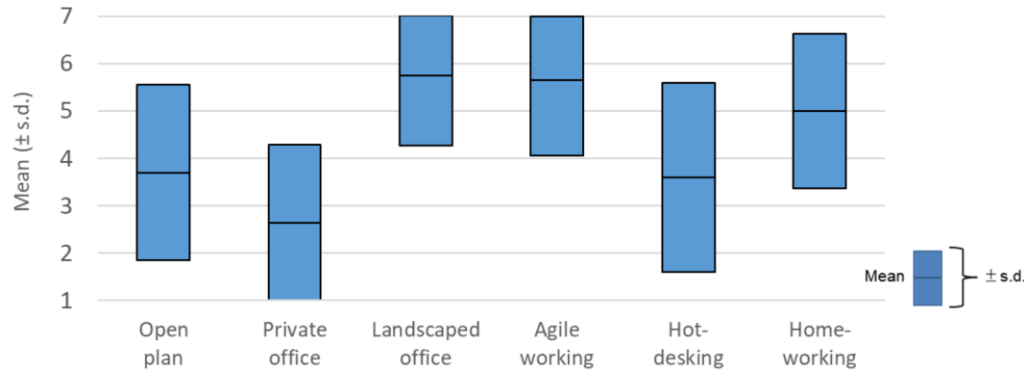


Figure 1 Mean ratings (and standard deviation) of office designs and practices

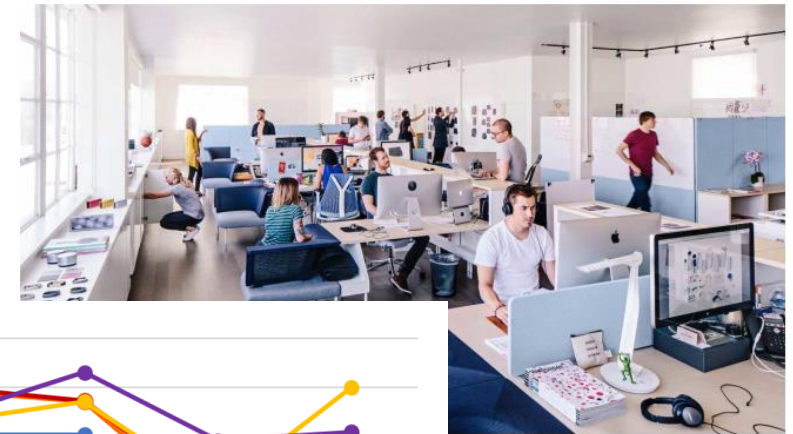


Figure 2 Mean rating of office preferences by current primary workspace

<http://workplaceunlimited.com/Office%20Preferences%20Full%20Report%20v1.1.pdf>




# Personal Office Preferences



<https://soundofcolleagues.com/#>

<https://mynoise.net/NoiseMachines/openOfficeNoiseGenerator.php>

<https://coffitivity.com/>

 @JackH\_C



# Case study: Transformation from “Traditional”...

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# ... to activity-based working

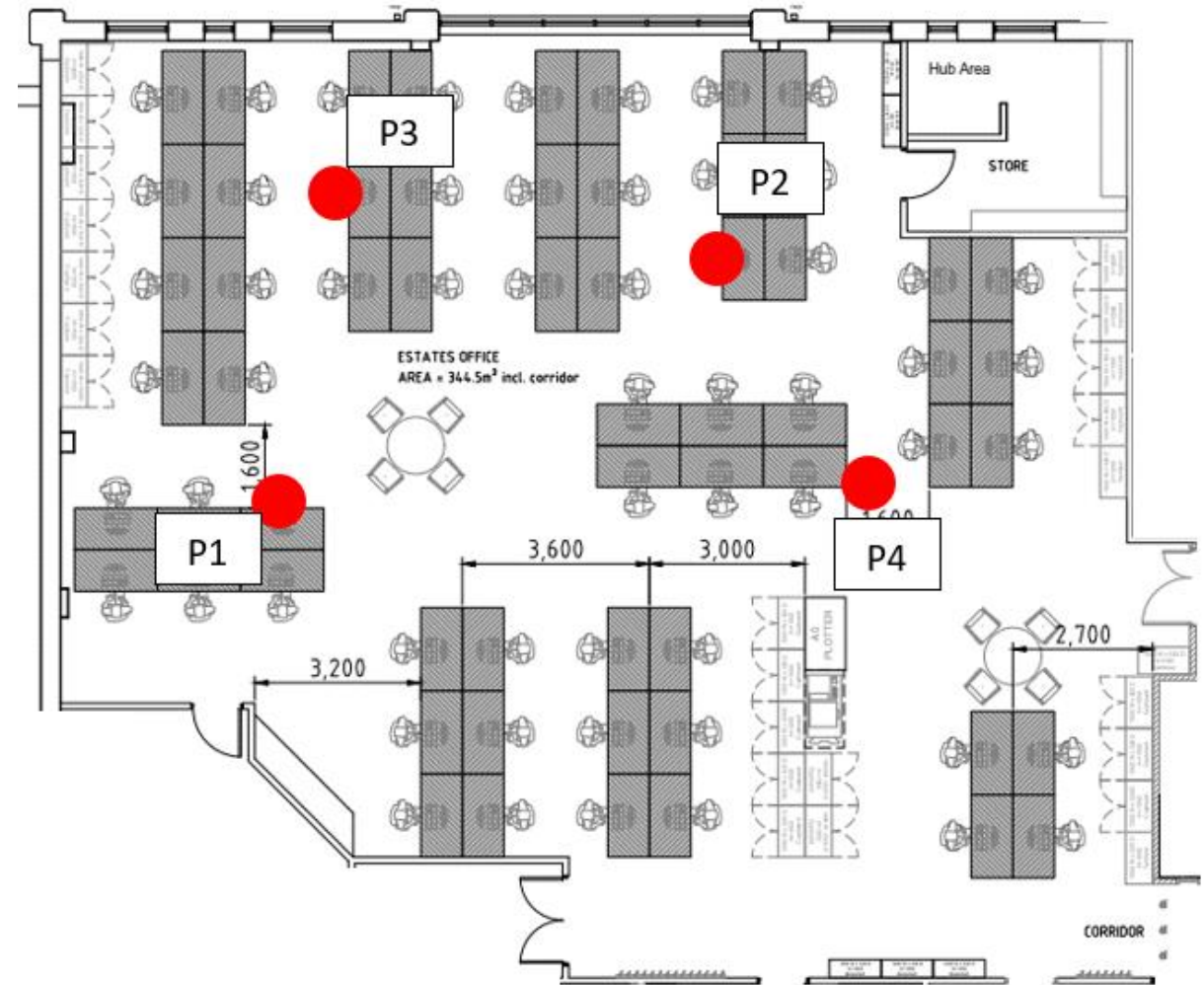
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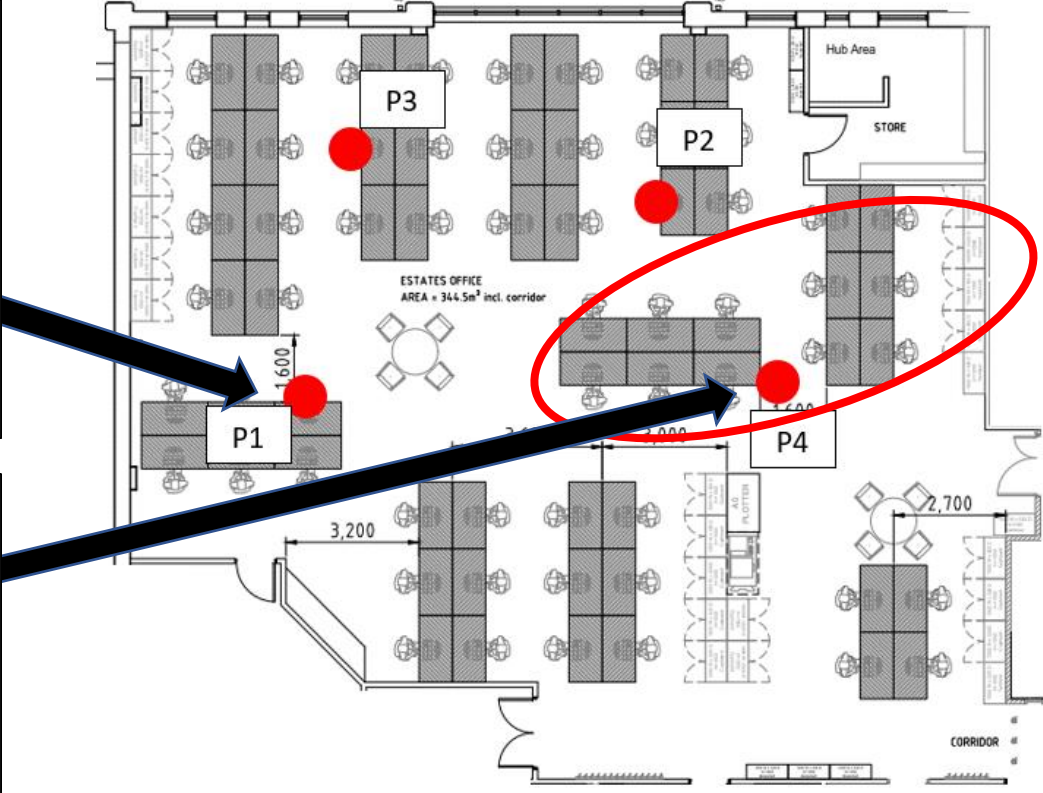
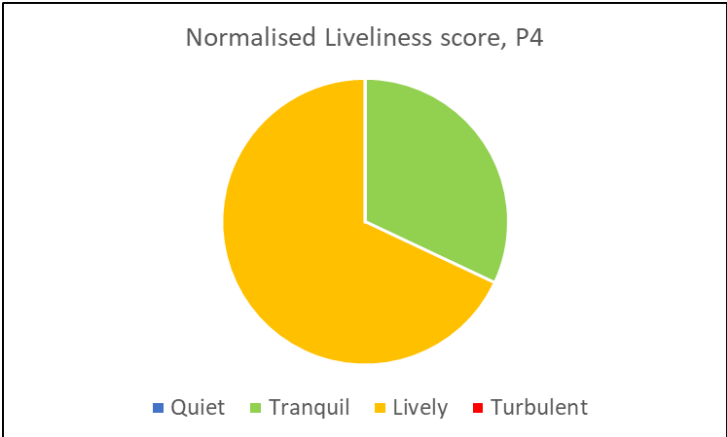
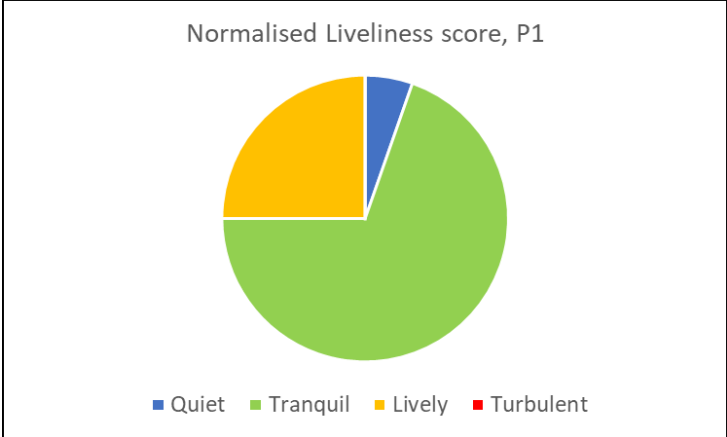
- Lighting – 23 % improvement
- Thermal – 39 % improvement
- Acoustic – 21 % improvement

# Case study: addressing noise problems

- Room acoustic measures
- In-situ measurements
- Noise comfort questionnaire



# Case study: addressing noise problems



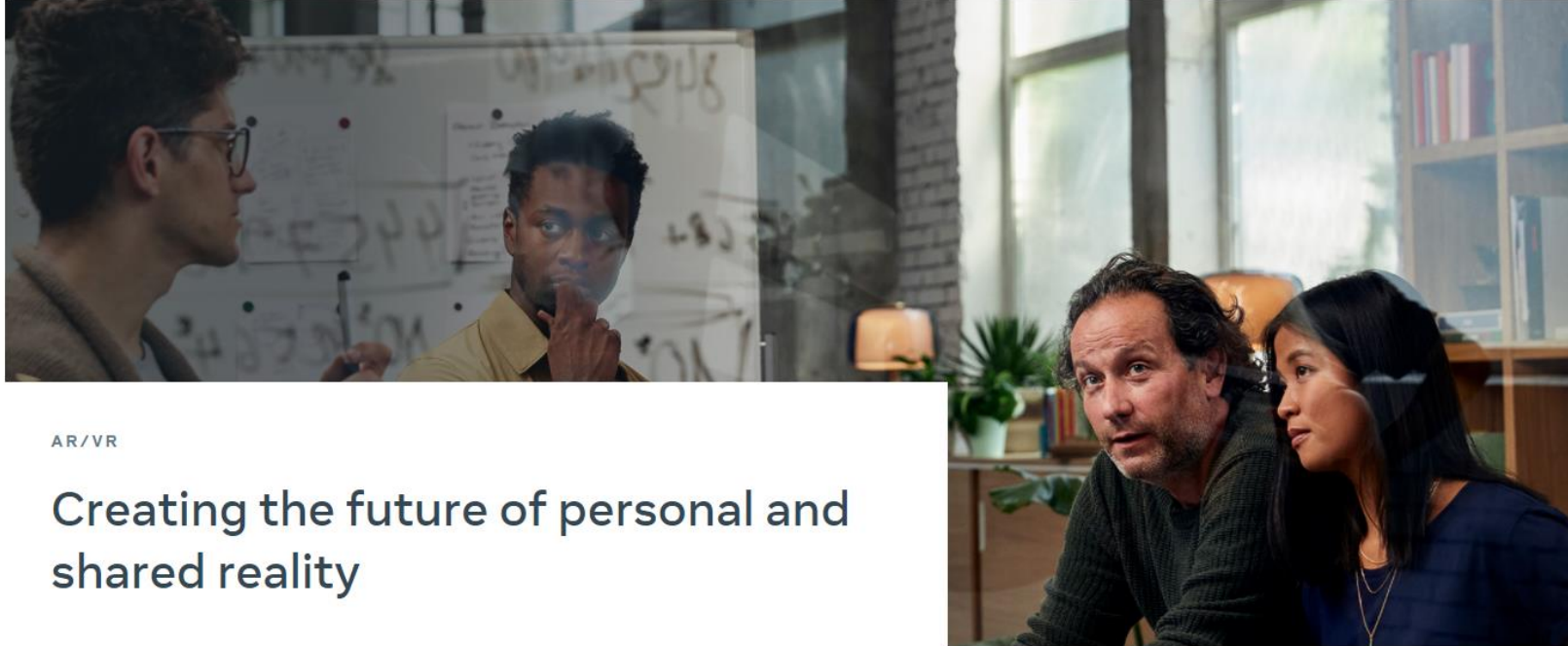
# Post Covid office acoustic challenges

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- Lower occupancy
- More VC
- Changing nature of the office

# Facebook Reality Labs

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AR/VR

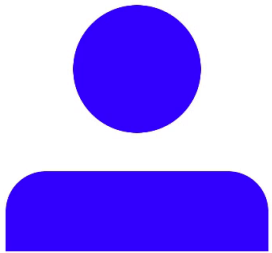
Creating the future of personal and shared reality

At Facebook Reality Labs, our mission is to give people the tools to feel connected anytime, anywhere.

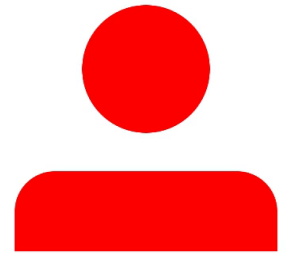
<https://research.fb.com/category/augmented-reality-virtual-reality>

# Spatial information currently lost in VC

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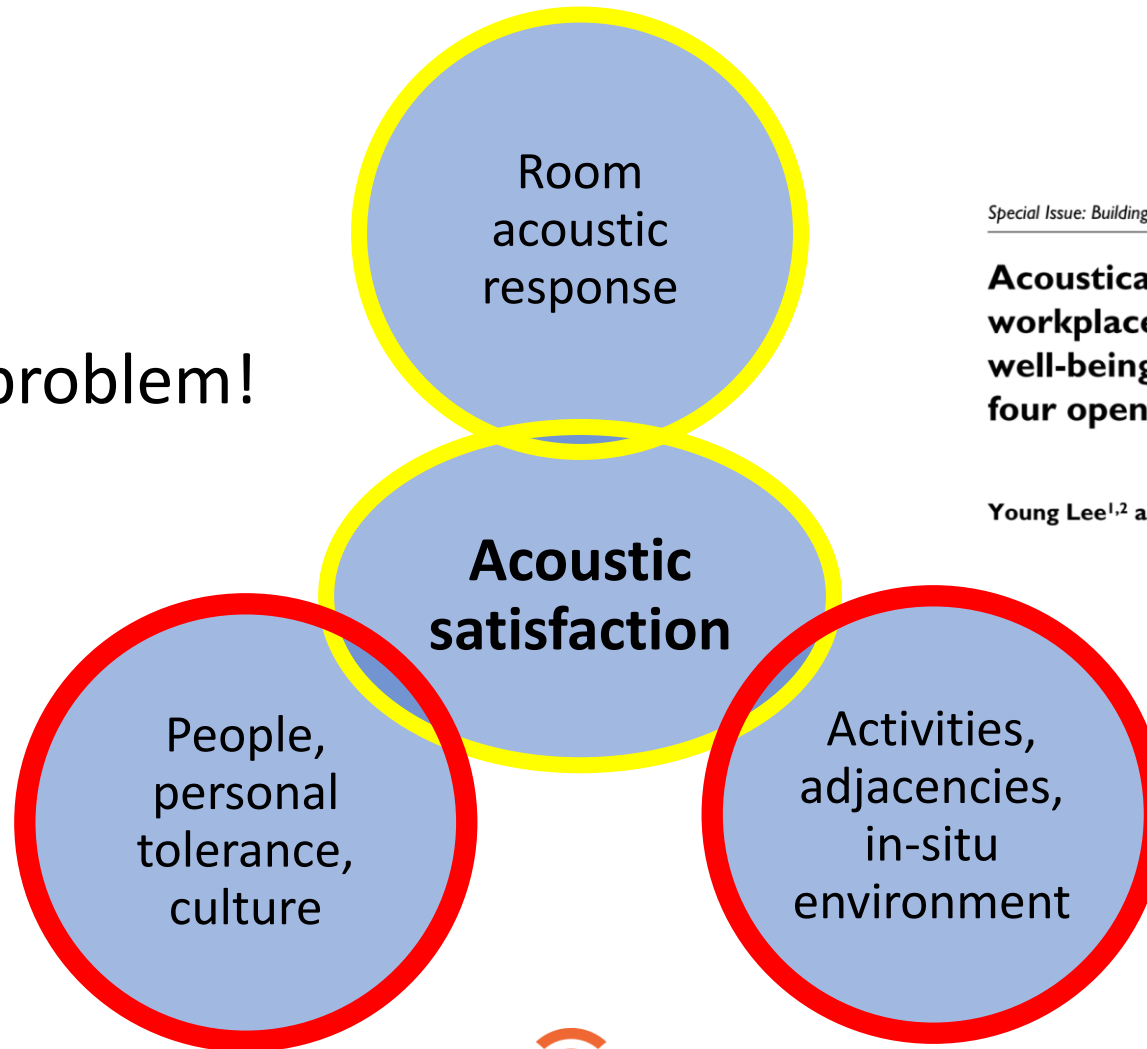
<https://youtu.be/pTOIJoojO9Y>





# Designing for acoustic satisfaction

Cross-disciplinary problem!



*Special Issue: Building Acoustics and Health*

**Acoustical planning for workplace health and well-being: A case study in four open-plan offices**

Young Lee<sup>1,2</sup> and Francesco Aletta<sup>1</sup> 

**BUILDING ACOUSTICS**

Building Acoustics  
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# The questions that you ask!

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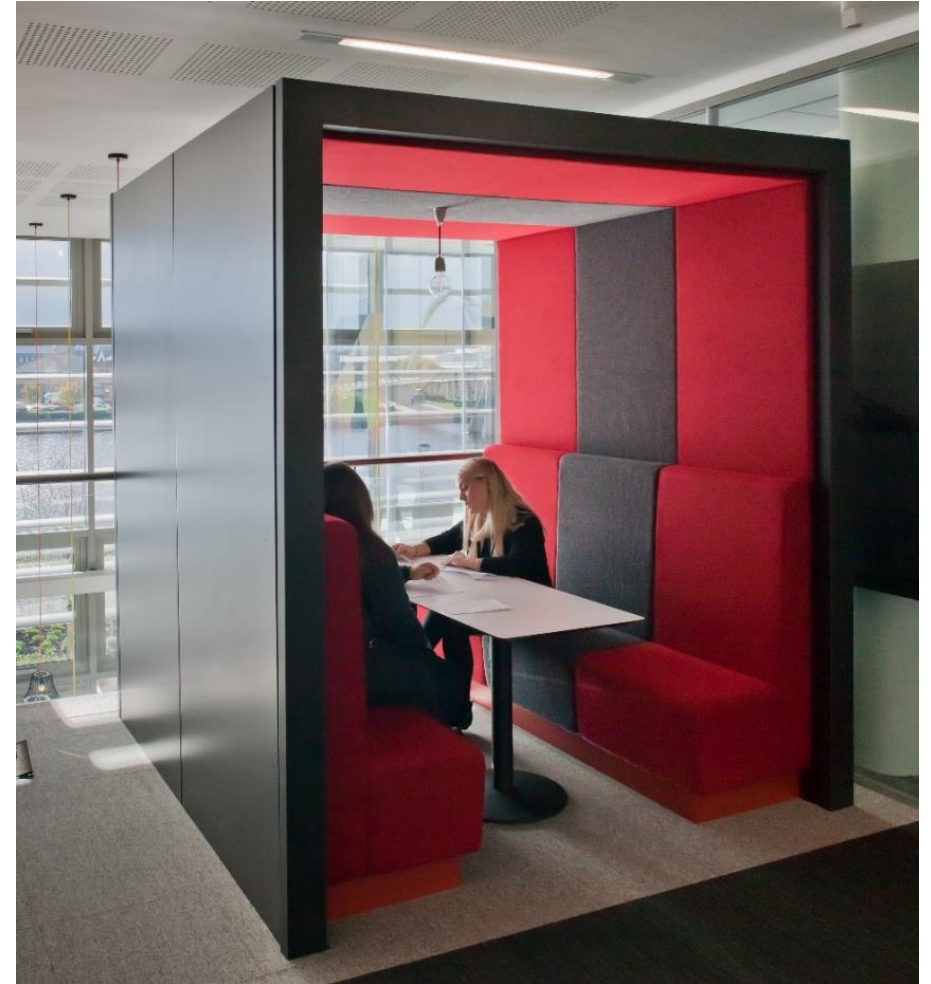
Jack Harvie-Clark

jhc@apexacoustics.co.uk



[www.apexacoustics.co.uk/acoustics-open-plan-offices/](http://www.apexacoustics.co.uk/acoustics-open-plan-offices/)

 @JackH\_C





# NEXT EVENT

**Friday 29<sup>th</sup> January, 2021 (via Zoom)**

Legal Topic (Topic and Speaker – To Be Confirmed)

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Are you a Chartered surveyor and interested in becoming a Member of the 1947 Club? – contact a Committee member or send a message through LinkedIn

[www.the1947club.co.uk](http://www.the1947club.co.uk)

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