People-centred offices:

A psychological approach to resolving office noise distraction

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Office noise is a problem

“53% of respondents say workplace enables them to work productively”
Evidence based approach

- Literature Review: develop hypotheses
- Tool Development: apply hypotheses
- On-line Survey: verify hypotheses
- Intervention Study: test tool

>150 research papers
>500 survey responses
What is noise?

“Noise is *unwanted* sound”

Sound level = 25% noise
Context & attitude effects
What is psychoacoustics?

“Psychoacoustics is the scientific study of the psychological and physiological responses associated with sound”

Study of how people perceive, interpret and react to sound
Factors affecting noise

We studied:

• Control & coping mechanisms
• Personality type
• Work activity
• Place of work
• Acoustic design features
• Individual factors e.g. age
Survey response scales

Our survey included:

- Performance
- Speech interference
- Concentration
- Distraction
- Stress
- Wellbeing
Noise affects performance

Mean effect of noise = -5.1%

-ve 25.0
zero 10.1
+ve 64.9
Coping mechanisms

- Move to another team or organisation
- Build a physical barrier
- Move to another desk
- Raise the issue with colleagues
- Move to a meeting room
- Wear headphones/earplugs
- Come in early or work late
- Move to quiet pod or breakout
- Work from home or elsewhere

% Response
OCEAN – Big 5 personality inventory

Closed-minded  Openness
Disorganised  Conscientiousness
Introverted  Extraversion
Disagreeable  Agreeableness
Emotionally stable  Neuroticism

Introverts v extroverts

<table>
<thead>
<tr>
<th>Category</th>
<th>Extrovert</th>
<th>Introvert</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distraction</td>
<td>3</td>
<td>3</td>
<td>NS</td>
</tr>
<tr>
<td>Speech</td>
<td>3</td>
<td>3</td>
<td>NS</td>
</tr>
<tr>
<td>Concentration</td>
<td>2.5</td>
<td>3</td>
<td>NS</td>
</tr>
<tr>
<td>Wellbeing</td>
<td>2</td>
<td>3.5</td>
<td>lower score indicates better</td>
</tr>
<tr>
<td>Stress</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>3.5</td>
<td>3.5</td>
<td></td>
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</tbody>
</table>

Note: lower score indicates better.
Arousal theory
# Task & personality

<table>
<thead>
<tr>
<th>Personality</th>
<th>Task</th>
<th>Quiet</th>
<th>Noisy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introvert</td>
<td>Simple</td>
<td>😊</td>
<td>😞</td>
</tr>
<tr>
<td></td>
<td>Complex</td>
<td>😊</td>
<td>😞</td>
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<tr>
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<td>Simple</td>
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<tr>
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<td>Complex</td>
<td>😞</td>
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</table>
Neurotic v stable

<table>
<thead>
<tr>
<th>Category</th>
<th>Stable</th>
<th>Neurotic</th>
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</thead>
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<td>2.5</td>
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<tr>
<td>Speech</td>
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<tr>
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<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>Performance</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

- Conscientious: ✓
- Agreeableness: ?
- Openness: ×

NS indicates no significant difference.
Contributing variables

Multiple regression analysis

Personality type +
Perceived control +
Work activity +
Place of work +
Design features +
Individual factors =

41% PSYCHOLOGICAL +
25% SOUND LEVEL =

66% variance
People-centred approach

D

isplace

A

void

R

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E

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Activity based acoustic design methodology

Evaluation

- Acoustic/Physical Environment
- Roles & Work Activity
- Personality Profiles
- Individual & Team Factors

Solutions

1. Acoustic Layer
   Sound Treatment

2. Activity Layer
   Specific Work Settings

3. Zoning Layer
   Layout & Team Zoning

4. Behavioural Layer
   Education & Etiquette
Zoning layer

Team A

Team B
Activity layer

Calming Zone
- Team Lunch
- Informal Meeting
- Brainstorm

Stimulating Zone
- Private Call
- Breakout
- Focus & Concentrate
- Quiet Lunch
- Formal Meeting
- Walkabout

Teleconf
Coffee/Cafe
Acoustic layer – before
Acoustic layer – after
Thank you

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Design Guidance on eliminating office noise: A psychoacoustic approach

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