COLOUR & NOISE IN ADHD

THE FOUNDATIONS FOR AN AUDIO-VISUAL INSTALLATION

WHAT IS ADHD?

- ADHD is a **neurodevelopmental disorder** affecting behaviour.
- It can cause issues with organisation, time management, ability to focus and stress management.
- **3-4% of adults** are diagnosed with ADHD, with a higher male-to-female ratio (3:1).

CHALLENGES WITH DIAGNOSES AND TREATMENT

- Diagnoses and treatment can be **difficult to access**.
- Shortage of trained psychiatrists and ADHD medication in the UK.
- **NHS is overrun** and private providers are **closing off waiting lists.**

AIMS: To develop guidelines for an Audio-Visual Installation to **help mediate an ADHD mind**.

OBJECTIVES:

1. To identify which coloured noises are most relaxing for individuals with ADHD.
2. To explore emotional associations with different colours using a questionnaire.

METHODOLOGY

PARTICIPANTS

- University students who identify as **neurodivergent**
  - PILOT STUDY (NOISE): **3 participants**
  - FOLLOW-UP STUDY (NOISE): **5 participants**
  - COLOUR QUESTIONNAIRE : **5 participants**

COLOUR/EMOTION ASSOCIATION QUESTIONNAIRE

- Participants rated **10 colours** on likert scales for **8 different emotions**
- Colours based on the **Munsell Colour System** with the rules: Hue = 5, Chrome = 7, Value = 8.
- Emotions derivied from the **Brief Mood Introspection Scale** (BMIS)

NOISE STUDIES

- Participants ranked **12 coloured noises** (10 in pilot study) based on how relaxing they found them.
- Participants had opportunities to adjust their lists throughout the whole process.
- The final lists were quantified to allow for easy analysis.
- In the follow-up study, noise samples were introduced **randomly and anonymously** to avoid biases and the study took place in a noise-controlled environment

NOISE LITERATURE REVIEW

Moderate Brain Arousal Model (Soderland , 2007): Dopamine levels regulate the optimal external noise for cognitive performance.

- Study findings: ADHD participants showered **improved cognitive performance with white noise** due to stochastic resonance.
- Later Paper (2008): Stochastic resonance curve is **right-shifted for ADHD** people, indicating better performance with more noise.

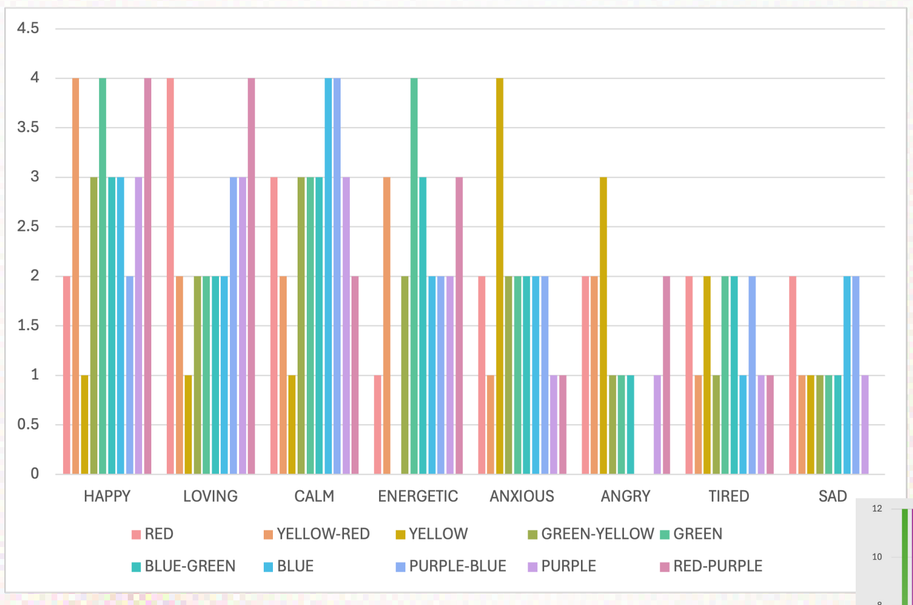
State Regulation Model (Metin et al, 2016): Impulsive choice in ADHD is linked to a defective dopamine regulation; found no significant influence of pink noise

- **Positive impact on cognitive performance**; environmental factors like task type and noise levels are imporant to consider.
- Optimal noise level = **77dB, Usher et al** (2000)

COLOUR

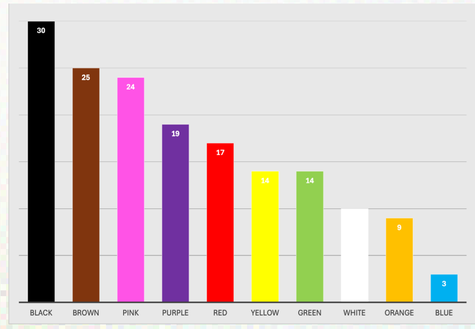
- Colours elicit different **physiologial responses** (Marhalim, 2015)
- **Duyan** (2022): Wall colours in classroom **influencing student behaviour**; Positive effects with RED-PURPLE, GREEN, GREEN-YELLOW, YELLOW, and ORANGE; Negative effects with RED, PURPLE, GREY, and BLUE-GREEN.
- **Form-function harmony** (Datta, 2008): Importance of matching physical apperance to the space's use; **excessive colours can overstimulate** users (max. of 6 colours is ideal).

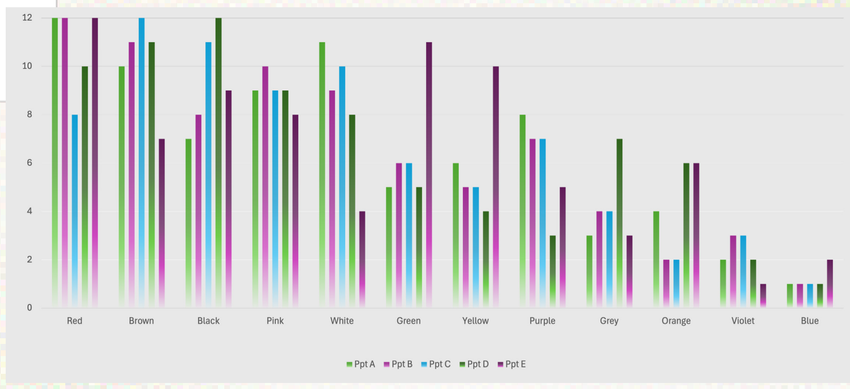
RESULTS

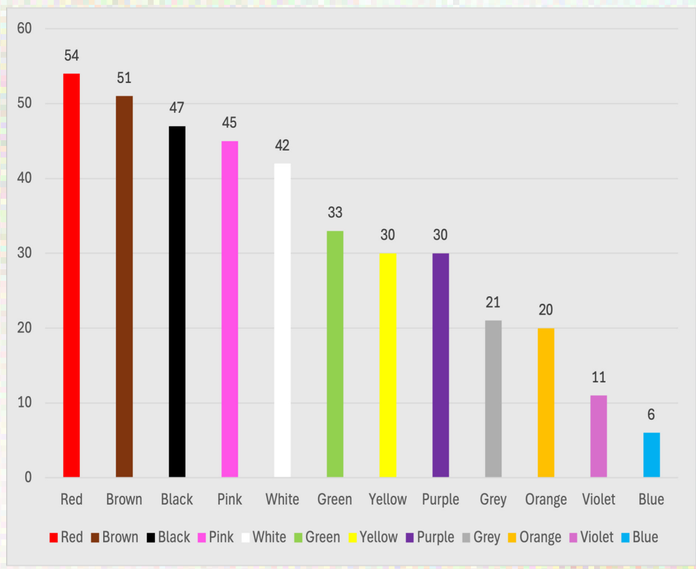


- Positive associations (Happy, Calm, Loving): **RED, YELLOW-RED, GREEN, BLUE, BLUE-PURPLE, RED-PURPLE**
- Negative associations (Anxious, Angry, Tired, Sad): **YELLOW and BLUE-GREEN**

- **Top relaxing noises**: Brown/Red Noise, Black Noise and Pink Noise
- **Least relaxing noises**: Blue Noise, Violet Noise, Orange Noise
- Preference for **lower frequency noises** (deeper sounds)
- Blue Noise and Violet Noise elicited a **visceral reaction** from participants
- Observastions and short interviews with some participants highlighed an importance for **users to adjust the volume to their needs**







DISCUSSION

- Effective noise and colour choices can create a supportive space for ADHD individuals
- Future installations should **include an interactive element** to allow for personal adjustments in noise levels and colour exposure
- Need for further research into how best to physcially display the these colours within the installation

EVALUATION

- **Ethnocentric** - Cultural differences for colour associations
- Noise studies should include **tasks for participants** to complete
- Colour/emotion association research should have included **in-person interviews**
- Colours on questionnaires would have appeared differently across different devices
- **Higher sample size** needed for both studies

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BIBLIOGRAPHY