UNDERSTANDING SENSORY TRIGGERS IN INTERIOR SPACES FOR PEOPLE WITH ANXIETY

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***Abstract* — People with anxiety experience heightened sensitivity to sensory input, especially in interior environments that contain overstimulating elements. This research investigates how sensory triggers such as harsh lighting, clutter, loud sounds, sharp edges, rough textures, cold materials, high-contrast colours, and poor spatial planning contribute to anxiety in interior spaces. The study aims to use sensory mapping to identify these triggers, understand their psychological impact, and propose design strategies to minimize discomfort. Observational methods were used to analyse how interior elements influence emotional responses, based on established principles of sensory processing and environmental psychology.**

The findings indicate that unpredictable lighting, visual noise, echoing acoustics, cramped layouts, and cold materials activate the brain's stress response by signalling unpredictability or potential danger. Individuals with anxiety are especially vulnerable due to their heightened sensory processing, which causes overstimulation. The results also show that warm lighting, natural textures, plants, acoustic comfort, soft materials, curved forms, and open circulation patterns help reduce tension, promote calmness, and support emotional well-being. This study concludes that sensory mapping is an effective method for identifying and minimizing anxiety triggers in interior spaces, enabling designers to create environments that support mental comfort and psychological safety.

***Index Terms* — sensory triggers; interior spaces; anxiety; lighting; textures; spatial layout**

I. Introduction

Interior spaces strongly influence how people think, feel, and respond to their surroundings. For individuals with anxiety, this influence becomes even more significant because their nervous system is more alert and sensitive to sensory input. Every interior environment contains visual, auditory, tactile, and spatial cues that determine whether a space feels peaceful or stressful. Elements such as lighting, sound levels, textures, colours and the organization of a room affect emotional comfort.

People with anxiety experience heightened sensitivity toward their surroundings, so even small sensory disturbances can feel overwhelming. Extremely bright lights, cluttered furniture arrangements, sudden noises, sharp angled furniture, tight pathways, or visually busy walls may make the brain react defensively and activate the fight or flight response. This response increases tension, worry, and overstimulation even when the environment is physically safe.

Modern life requires people to spend most of their time indoors which increases the need for mental health supportive interior design. However, many indoor spaces are unintentionally filled with sensory triggers because traditional design focuses mainly on appearance or function rather than emotional impact. As a result people with anxiety find it difficult to feel comfortable in spaces that contain strong light glare, loud echoes, excessive patterns, or cold materials.

Sensory mapping addresses this issue by identifying the areas of a room that cause discomfort. It helps designers understand how each sensory factor influences anxiety. This includes analysing lighting brightness, shadow formation, colour complexity, clutter density, noise reflections, material temperature, and spatial circulation. Mapping these elements makes it possible to locate anxiety hotspots and redesign spaces to feel calmer, safer and more predictable.

II. Literature Review

1. Sensory Triggers in Interior Environments

Research shows that sensory factors like lighting, colour, sound, texture and layout strongly influence emotional responses in interior spaces. Studies in environmental psychology (Ulrich, 1984; Kaplan, 1995) highlight that overstimulating environments increase stress and anxiety. Harsh lighting, clutter and noise are commonly identified as major anxiety triggers.

2. Lighting and Visual Overload

Studies on lighting (Küller et al., 2006) explain that bright, glaring or flickering lights activate stress responses, especially in people with anxiety. Research also shows that visual clutter, strong colour contrasts and busy patterns increase cognitive load, making anxious individuals feel overwhelmed (McMains & Kastner, 2011).

3. Sound, Texture and Material Preferences

Acoustic research indicates that echoing or noisy interiors heighten anxiety by creating unpredictability and sensory overstimulation. Material studies show that cold, hard surfaces increase discomfort, while natural materials like wood, fabric and warm textures promote calmness and emotional comfort.

4. Spatial Layout and Perceived Safety

Research on spatial organization shows that cramped or disorganized layouts cause feelings of restriction and tension (Evans & Weber, 2007). Open, clear pathways and predictable layouts support feelings of safety and control, which are essential for reducing anxiety in interior environments.

III. Aim, Objectives and Scope

1. Aim

The aim of this study is to understand how different sensory elements inside interior spaces affect people with anxiety, and to identify which specific triggers cause discomfort so that designers can create calmer and more supportive environments.

2. Objectives

1. To identify the common sensory triggers in interior spaces such as lighting, clutter, sounds, textures, colours and spatial layout.
2. To understand how these sensory elements affect the emotions and comfort levels of people with anxiety.
3. To map the locations of anxiety-triggering elements within interior spaces.
4. To suggest design strategies that reduce sensory discomfort and improve emotional well-being.

3. Scope

The study focuses only on interior spaces and how their sensory features influence anxiety. It examines lighting, sound, textures, colour schemes, clutter levels, and spatial arrangement as possible triggers. The study does not include outdoor environments or medical treatments for anxiety. The findings are useful for designing homes, workspaces, and public interiors to make them more comfortable and anxiety-friendly.

4. Limitations

The study is based only on observations of interior spaces. It does not include medical testing or long-term anxiety measurement. Results may vary because each person experiences anxiety differently.

IV. Research Methodology

The study uses sensory mapping to observe lighting, sound, textures, clutter and layout in interior spaces. These elements are analysed to find which ones trigger anxiety and where they appear in a room.

1. Literature Review

Research shows that sensory elements such as lighting, sound, textures, clutter and spatial layout strongly affect anxiety levels in interior spaces. Studies consistently find that harsh lighting, noise, visual overload and cramped layouts increase stress, while warm lighting, natural materials and organized spaces help create calmness. Overall, literature highlights that identifying sensory triggers is important for designing interiors that support emotional comfort for people with anxiety.

2. Material Exploration

Examined different interior materials to study how their texture, temperature and appearance affect anxiety levels. Natural materials such as wood, fabric and soft finishes were explored for calming properties. Cold or reflective materials such as metal and glass were tested to understand their potential to trigger discomfort.

3. User Perception Survey

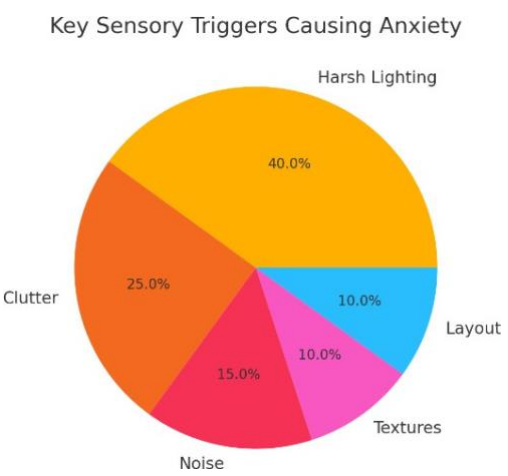
A structured questionnaire with 15 questions was given to 30 participants to understand how people with anxiety respond to lighting, clutter, sound, textures and room layouts. The survey helped identify which sensory elements caused discomfort and which ones made spaces feel calming.

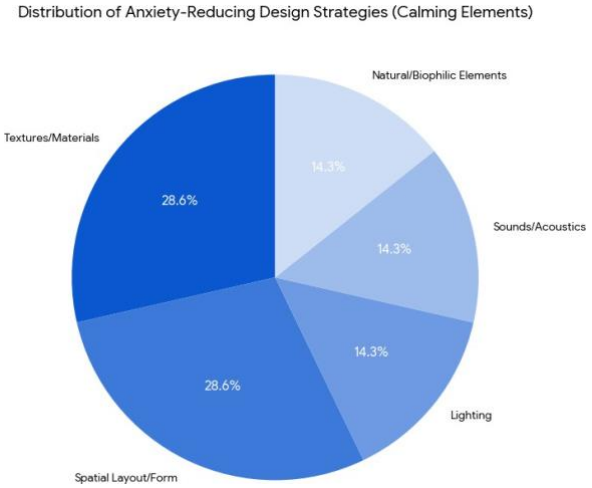
4. User Perception Survey

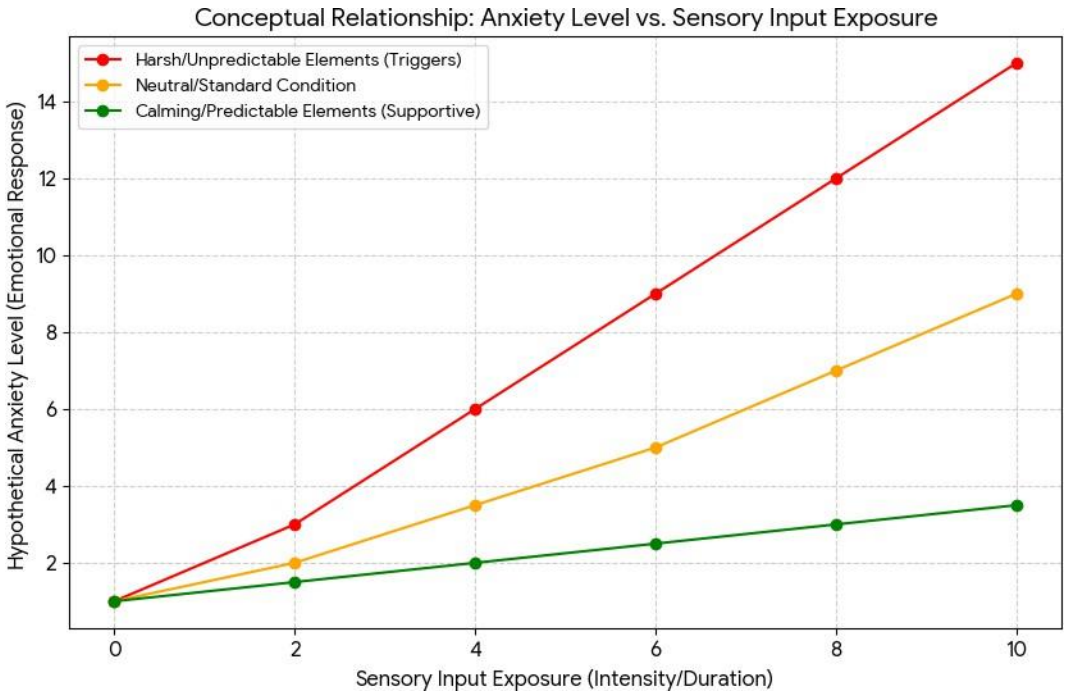
Interior spaces were visually analysed to identify sensory triggers such as glare, shadows, cluttered areas, sharp edges, high-contrast colours and cramped zones. Observations were used to map anxiety-triggering locations and evaluate how different sensory elements contribute to overall discomfort.

V. Survey Analysis

The survey results show that harsh lighting is perceived as the strongest anxiety trigger in interior spaces (40%). Clutter follows at 25%, indicating that visual overload remains a major concern. Noise, textures, and layout each contribute smaller but significant portions of anxiety responses. Overall, participants clearly identified sensory elements that make a space feel overwhelming or stressful. The findings support the need for better lighting design,decluttered layouts and softer materials in anxiety-friendly interiors.







The graph shows how anxiety levels change with increasing sensory input exposure in interior spaces. Three different conditions were compared: harsh and unpredictable sensory elements, neutral environments, and calming and predictable design elements.

The results show that harsh and unpredictable elements such as bright lighting, clutter, sharp sounds and strong visual contrasts cause anxiety levels to rise very quickly. As sensory intensity or duration increases, emotional discomfort grows significantly and reaches the highest level on the scale.

The neutral condition shows a steady but moderate increase in anxiety. This suggests that even normal interior settings can become uncomfortable over time if sensory balance is not considered.

Calming and predictable elements such as warm lighting, natural textures, soft acoustics and organized layouts keep anxiety levels low and stable. Even at higher exposure levels, the emotional response remains manageable and comfortable.

Overall, the chart shows that the type of sensory input inside a space directly affects emotional well being. Harsh sensory environments raise anxiety quickly, while calming design elements help maintain comfort and psychological stability. This supports the importance of sensory mapping in creating anxiety friendly interiors.

VI. Results and discussion

The research findings demonstrate a clear link between specific sensory properties of interior spaces and heightened anxiety, particularly in sensitive individuals. Anxiety triggers were identified as elements that introduce unpredictability and overstimulation, such as harsh lighting, echoing acoustics, cold materials, and cramped layouts, which activate a defensive stress response. Conversely, the study validated that design strategies centred on predictability and comfort including warm lighting, natural textures, acoustic comfort, and curved forms are effective in reducing tension and promoting psychological safety. The core conclusion is that sensory mapping provides a necessary framework for designers to move beyond traditional aesthetic and functional goals to create environments that are intentionally supportive of mental well-being.

VII. Hypothesis

1. Null Hypothesis

There is no significant difference in anxiety levels between warm lighting and harsh lighting in interior spaces. This hypothesis assumes that lighting type does not influence how a person with anxiety feels in a given environment. According to this assumption, both warm, soft lighting and bright, intense lighting produce the same emotional response, with no measurable change in stress, comfort or relaxation.

Under this hypothesis, lighting is treated as a neutral environmental factor rather than a sensory trigger. Any increase or decrease in anxiety levels observed during the study would be considered unrelated to lighting conditions and instead attributed to external variables or natural variations in individual responses.

This null hypothesis provides a baseline for comparison, helping the research determine whether lighting truly affects anxiety or whether the differences seen are statistically insignificant. It allows the study to test if design elements such as colour temperature, brightness or glare genuinely impact emotional well being or if their effects are assumed to be minimal.

VIII. Conclusion

This research on **Understanding Sensory Triggers in Interior Spaces for People with Anxiety** highlights how strongly interior environments can influence emotional well being. The study found that lighting, sound, textures, visual clutter and spatial layout play a major role in shaping how safe or stressed a person feels inside a room. Sensory mapping helped identify the exact elements within a space that trigger discomfort, such as harsh lighting, echoing noise, tight layouts, cold materials and overwhelming visual patterns.

Survey responses and visual assessments clearly showed that people with anxiety are highly sensitive to sensory overload. Harsh and unpredictable sensory inputs led to increased anxiety, while calming design features like warm lighting, natural textures, quiet acoustics and organized layouts helped create a sense of safety and relaxation. The conceptual graph reinforced this, showing a direct relationship between sensory intensity and rising anxiety levels, especially when the environment contains strong triggers.

The study also demonstrated that many anxiety-friendly solutions are simple design adjustments, such as reducing clutter, softening lighting, improving acoustics and using natural materials. These changes can significantly lower emotional stress and make interior spaces more supportive. Sensory mapping proved to be a useful method for identifying problematic areas and providing designers with a clearer understanding of where improvements are needed.

Overall, this research emphasizes that interior design is not just about aesthetics but also about psychological comfort. By understanding how sensory triggers affect individuals with anxiety, designers can create spaces that feel calmer, safer and more emotionally stable. The findings offer valuable guidance for future interiors in homes, workplaces and public environments, encouraging designs that support mental well being and reduce daily stress.

IX. References

[1] Diker, B., & Demirkan, H. (2022). Distress, Anxiety, Boredom, and Their Relation to the Interior Spaces.

[2] Peña, J. A. V. (2025). How Does Interior Design Influence the Sensory and Emotional Experience of People Who Inhabit a Space?

[3] Johnston, C. (2024). The Neuropsychology of Space: Designing Environments for Emotional Well-being.

[4] Ulrich, R. S. (1991). Effects of interior design on wellness: Theory and recent scientific research. Journal of Health Care Interior Design.

[5] Küller, R., Ballal, S., Laike, T., Mikellides, B., & Tonello, G. (2006). The impact of light and colour on psychological mood. Lighting Research & Technology.

[6] Evans, G. W., & Wener, R. E. (2007). Crowding and personal space invasion in the workplace. Environment and Behavior.

[7] Jiang, B., Li, D., Larsen, L., & Sullivan, W. C. (2016). A dose–response curve describing the relationship between urban tree cover density and self-reported stress recovery. Environment and Behavior.