

The Influence Of Lighting On Human Psychology In Interior Spaces

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ABSTRACT

Lighting is often treated as a practical requirement: it helps people see, move safely and complete everyday tasks. Yet the experience of a room is shaped by much more than visibility. The brightness, colour appearance, direction, timing and distribution of light can influence how a space is perceived and how people feel within it. This paper reviews research connecting indoor lighting with mood, alertness, circadian rhythms, cognitive performance, visual comfort and spatial perception. It brings together findings from lighting science, environmental psychology and interior architecture, while recognising that responses vary with the person, task, time of day and wider environment.

The discussion considers daylight and electric light, illuminance, correlated colour temperature (CCT), glare, contrast, layered lighting and dynamic control. It also outlines a practical research method that can be used by interior design students to investigate user responses in real spaces. The paper argues that psychologically responsive lighting is not achieved by simply making an interior brighter or selecting one preferred colour temperature. It requires a balanced approach that connects measurable lighting conditions with users' reported experiences.

The paper is a literature-based review, not a report of new experiments; no original participant results are claimed.

Keywords: lighting design, environmental psychology, interior spaces, mood, circadian rhythm, illuminance, colour temperature, visual comfort.

1. INTRODUCTION

Light is one of the quiet elements that shapes everyday life. A person may not consciously notice the light in a classroom, bedroom, shop or hospital waiting area, but its quality can affect whether the place feels welcoming, tiring, calm, confusing or lively. The same room can appear completely different in morning daylight, under a warm evening lamp or beneath a strong overhead fixture. These changes are not only visual; they can influence comfort, attention and the meaning people attach to a space. Interior design therefore needs to consider lighting as part of the user experience rather than as a final decorative layer. Furniture, colour, texture and spatial planning are all perceived through light. A beautifully finished surface may look flat when it is evenly illuminated, while directional light can reveal its texture.

Conversely, a strong beam reflected from a glossy counter can create discomfort and make a task harder. Lighting affects what is noticed first, how clearly people read a space and whether they feel able to use it with ease. Research into light has expanded beyond vision. The eye supports image-forming vision, but light also reaches biological pathways involved in timing the body's daily rhythms. Light exposure can affect alertness and circadian regulation, although the outcome depends on the spectrum, intensity, duration and timing of exposure (Brown et al., 2022; "Non-visual effects of indoor light environment on humans," 2021). These processes help explain why daytime and nighttime lighting should not automatically be designed in the same way.

This paper examines how lighting variables relate to psychological and physiological responses in interior environments. It takes a human-centred perspective: rather than claiming that a single lighting arrangement makes everyone feel the same way, it considers how design choices may support comfort and activity for different users. The subject is relevant to homes, educational spaces, workplaces, healthcare settings, hospitality interiors and retail environments.

2. TYPES OF LIGHT IN INTERIOR DESIGN

Lighting is an important element of interior design because it affects the appearance of a space, visual comfort, mood and the way people experience their surroundings. Light can be classified according to its source, colour temperature and function.

2.1 Natural Light

Natural light comes from the sun and enters interior spaces through windows, skylights, glass doors and other openings. Its intensity and colour change throughout the day and according to weather conditions.



Figure 1: Natural light entering an interior through large glazed openings.

Characteristics and effects:

- Creates a bright, fresh and open atmosphere.
- Helps reveal the natural colours and textures of materials.
- Provides a visual connection with the outdoors.

- Supports the body's natural day–night rhythm.
- Can reduce the need for artificial lighting during the day.
- Requires control of glare, heat and excessive brightness.

Applications: Living rooms, offices, classrooms, showrooms and other spaces with suitable daylight access.

2.2 Warm Light (2700K–3000K)

Warm light has a yellowish or golden appearance. It creates a cosy, intimate and welcoming atmosphere and is commonly used in spaces designed for relaxation and social interaction.



Figure 2: Warm light creating an intimate lounge atmosphere.

Characteristics and effects:

- Creates a comfortable and inviting environment.
- Enhances warm colours, wood and gold-toned materials.
- Can create a feeling of intimacy and luxury.
- Works well for decorative and accent lighting.
- May provide insufficient visibility if the illumination level is too low.

Applications: Bedrooms, lounges, restaurants, hotel interiors, reception areas and jewellery displays.

2.3 Cool Light (4000K–6500K)

Cool light appears neutral white to bluish-white. It is often used in spaces that require clear visibility and support for detailed visual activities.

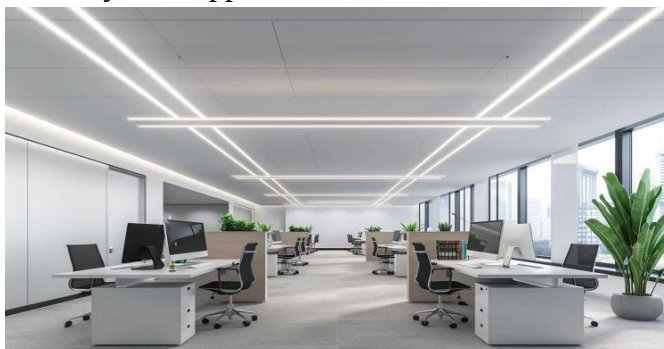


Figure 3: Cool light in an open-plan office. Image source: luxes.es.

Characteristics and effects:

- Creates a crisp and clean appearance.
- Supports visibility for detailed tasks when appropriately designed.
- Can make an interior feel bright and contemporary.
- Is commonly used in work and study environments.
- Excessive brightness or glare can cause visual discomfort.
- Its effect on alertness depends on intensity, timing and exposure duration.

Applications: Offices, study rooms, laboratories, healthcare facilities, workshops and selected retail display areas.

3. AIM AND OBJECTIVES

3.1 Aim

To study the influence of lighting on human psychology in interior spaces and understand how different types of lighting affect human mood, emotions, behaviour, concentration, visual comfort and overall well-being. The study also aims to explore how natural light, warm light and cool light can be used effectively in interior design to create comfortable, functional and visually appealing environments.

3.2 Objectives

1. **To study different types of lighting:** to understand natural light, warm light and cool light, along with their characteristics and applications in interior spaces.
2. **To analyse the psychological effects of lighting:** to examine how different lighting conditions influence human mood, emotions, relaxation and alertness.
3. **To understand the relationship between lighting and human behaviour:** to explore how lighting affects concentration, productivity, interaction and activities within interior environments.
4. **To study the role of colour temperature and intensity:** to understand how brightness, colour temperature and light distribution influence visual comfort and spatial perception.
5. **To examine the importance of natural lighting:** to investigate how daylight contributes to visual comfort, the perception of space and the body's natural day-night rhythm.

4. UNDERSTANDING LIGHT IN INTERIOR DESIGN

4.1 Introduction

Light is one of the most important elements of interior design because it influences how people see, feel and experience an interior space. It helps define the appearance of colours, textures, furniture, materials and architectural features. Proper lighting can make a space feel comfortable, spacious, welcoming, relaxing or energetic, depending on its purpose.

In interior design, lighting is not only used to provide visibility but also to create atmosphere, support daily activities, improve visual comfort and influence human psychology. A well-designed lighting scheme combines functionality and aesthetics to make an interior space both practical and visually appealing.

4.2 Importance of Light in Interior Design

- **Visibility:** provides sufficient illumination for everyday activities such as reading, working, cooking and shopping.
- **Mood and emotions:** different lighting conditions can create feelings of relaxation, warmth, energy or alertness.
- **Space perception:** bright lighting can make spaces appear more open, while dim lighting can create an intimate atmosphere.
- **Colour and texture:** light affects how colours, surfaces, materials and finishes appear.
- **Functionality:** different areas require different lighting levels depending on their activities.
- **Visual comfort:** proper lighting reduces unnecessary eye strain, harsh shadows and glare.
- **Aesthetic appeal:** lighting highlights architectural features, artwork, furniture and decorative elements.

4.3 Main Elements of Lighting

A. Light Intensity

Light intensity refers to the amount of light falling on a surface. Bright lighting is generally useful for detailed tasks, while lower lighting levels can create a calm and relaxing atmosphere. The appropriate intensity depends on the function of the space.

B. Light Direction

The direction of light influences shadows, depth and the appearance of objects. Direct lighting focuses light on a specific area, while indirect lighting reflects light off ceilings or walls to create softer illumination.

C. Light Distribution

Light distribution refers to how evenly light spreads throughout a space. Balanced distribution helps avoid areas that are excessively bright or too dark.

D. Glare and Shadows

Glare occurs when light is excessively bright or poorly positioned, causing visual discomfort. Shadows can add depth and visual interest, but harsh or unwanted shadows may interfere with activities.

4.4 Relationship Between Light and Human Psychology

Lighting affects the way people perceive and respond to interior environments. Its influence depends on brightness, colour temperature, duration of exposure, individual preferences and the activity being performed.

- **Relaxation:** softer, warm lighting can help create a peaceful and comfortable environment.
- **Alertness and concentration:** appropriate, well-distributed task lighting can support activities requiring attention.

- **Emotional response:** lighting can make an interior feel welcoming, dramatic, calm or lively.
- **Perception of space:** brightness, contrast and light direction influence the perceived size and depth of a room.
- **Daily rhythms:** exposure to natural daylight helps regulate the body's sleep–wake cycle, while bright light at night can affect sleep timing.
- **Shopping behaviour:** in commercial interiors, lighting can draw attention to products, influence the perceived quality of materials and shape the shopping experience.

These effects are not identical for everyone, so lighting should be selected according to the needs of users and the purpose of the space.

5. RESEARCH GAPS AND PROPOSED METHODOLOGY

5.1 Research Gaps

1. **Psychological effects:** limited understanding of how lighting affects mood, emotions, relaxation and concentration.
2. **Colour temperature:** further study is needed on how warm, neutral and cool lighting influence human perception.
3. **Natural vs. artificial light:** the combined effects of daylight and artificial lighting on comfort and well-being require further exploration.
4. **Visual comfort:** the impact of brightness, glare and shadows on user comfort needs investigation.
5. **Commercial interiors:** more study is needed on how lighting influences customer behaviour and shopping experiences.
6. **Jewellery store lighting:** the relationship between display lighting, product appearance, perceived luxury and customer comfort requires further study.
7. **Individual differences:** people may respond differently to lighting based on their preferences, activities and visual sensitivity.

5.2 Proposed Methodology

Research Questions

- **RQ1:** How do users describe their mood and visual comfort under different interior lighting conditions?
- **RQ2:** How do illuminance, CCT, glare and light distribution relate to users' ratings of the space?
- **RQ3:** In a jewellery-store setting, how can accent lighting highlight products while maintaining comfortable circulation and colour appearance?

Methodology

A practical study can use a mixed-method approach. First, review peer-reviewed research and document the lighting design of selected interiors. Second, measure illuminance at consistent points using a calibrated lux meter, noting the measurement plane, time, daylight condition and

electric-light settings. Record CCT and fixture details where reliable instruments or manufacturer data are available. Third, invite consenting participants to experience or view the space and complete a short questionnaire about visual comfort, perceived brightness, atmosphere, product visibility and preference. Optional short interviews can explain why participants chose their ratings.

The questionnaire should use neutral wording and the same rating scale across conditions. Participant age range, sample size, recruitment method, inclusion criteria and ethical safeguards should be stated. For a comparison, keep other conditions as consistent as possible and document factors that cannot be controlled. Analyse descriptive statistics alongside written comments; do not claim that lighting caused a response unless the design supports that conclusion. Any participant study should follow institutional ethics requirements and protect personal data.

6. DESIGN IMPLICATIONS

1. **Lighting selection:** choose suitable lighting types and colour temperatures according to the function of the space.
2. **Psychological comfort:** use appropriate lighting to create relaxing, welcoming or stimulating environments.
3. **Visual comfort:** avoid excessive brightness, glare and harsh shadows.
4. **Natural lighting:** maximise daylight through windows and skylights while controlling heat and glare.
5. **Layered lighting:** combine ambient, task and accent lighting for functionality and aesthetics.
6. **Commercial interiors:** use focused display lighting to highlight products and improve the customer experience, especially in jewellery stores.

7. LIMITATIONS

1. **Individual differences:** people may respond differently to the same lighting conditions.
2. **Limited sample size:** a small number of participants may not represent the wider population.
3. **Environmental factors:** wall colours, furniture, space layout and outside daylight may influence responses.
4. **Subjective responses:** mood and comfort are difficult to measure accurately because they depend on personal perception.
5. **Time constraints:** limited time may restrict the number of spaces and participants studied.

8. CONCLUSION

Lighting is an essential element of interior design that influences human psychology, mood, emotions, behaviour and visual comfort. Natural light, warm light and cool light create

different atmospheres and affect how people perceive and experience interior spaces. Proper lighting design improves functionality, aesthetics, concentration and overall well-being. By combining ambient, task and accent lighting according to the purpose of a space, designers can create comfortable and visually appealing environments. In commercial spaces, especially jewellery stores, effective lighting can enhance product appearance, highlight sparkle and colour, and improve the shopping experience. Therefore, lighting should be considered not only a functional requirement but also an important design tool for supporting human comfort and positive experiences.

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