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EFFECT OF MOOD LIGHTING ON HUMAN EMOTIONS AND BEHAVIOR

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ABSTRACT

Lighting is a fundamental element in interior design, exerting a profound influence on human emotions and behavior. Mood lighting, in particular, is a specialized form of lighting aimed at crafting specific atmospheres within spaces. This research endeavors to investigate the impact of mood lighting on human emotions and behavior. The study adopts a mixed-methods research design, encompassing a literature review, case studies, and an empirical investigation. The literature review delves into the historical evolution of mood lighting and its various types, elucidating their effects on human emotions and behavior. Through case studies, the paper showcases practical applications of mood lighting across diverse sectors.

The heart of this research lies in its empirical study, where findings from a survey administered to 100 participants aged 18 to 65 are presented. This survey evaluates participants' emotional responses and behavioral patterns under different lighting conditions, including bright white light, warm white light, cool white light, and colored lighting. Rigorous statistical analysis techniques, including ANOVA and regression analysis, will be employed to analyze the collected data. The study's results will illuminate the substantial impact of mood lighting on human emotions and behavior, providing valuable insights for professionals like designers, architects, and engineers to effectively utilize mood lighting in crafting desired atmospheres within interior spaces.

Keywords: Mood Lighting, Human Emotions, Behavior, Interior Design, Ambiance

1. INTRODUCTION

Mood lighting refers to the use of lighting to create an environment or ambiance that is conducive to a particular emotional or behavioral state. Mood lighting has become more and more popular in recent years, with the rise of smart lighting systems and the growing awareness of the importance of lighting in shaping our moods and behaviors. Lighting is an important element in creating the ambiance and atmosphere of a space. Mood lighting, specifically, is a type of lighting that aims to create a specific emotional mood within a space. It has been utilized in various industries, including hospitality, retail, and healthcare, to enhance the user's experience and achieve specific goals. Akcayir & Akcayir (2017)

Mood lighting can affect human emotions and behavior indifferent ways. For instance, warm white lighting can create a comforting and relaxed environment, while colored lighting create creativity and energy. Understanding the effects of mood lighting on human emotions and behavior can help designers, architects, and engineers create a space that promotes the desired emotional response and behavior. Chen et al. (2020).

The purpose of this research paper is to examine the effects of mood lighting on human emotions and behavior. The study will utilize a mixed-methods research design, including a literature review, case studies, and an empirical study.

1) Types of mood lighting

There are many types of mood lighting, each with its own exceptional characteristics and effects on human emotions and behavior. Some of the most common types of mood lighting include.

- **Warm Lighting:** Warm lighting, such as incandescent bulbs or warm LED lights, creates a pleasant and relaxing atmosphere that is associated with feelings of warmth, comfort, and relaxation
- **Cool Lighting:** Cool lighting, such as fluorescent or blue LED lights, creates a motivating and energizing atmosphere that is associated with feelings of alertness, focus, and productivity.
- **Dim Lighting:** Dim lighting, such as candle light or low-level LED lights, creates a loving and intimate atmosphere that is associated with feelings of relaxation and relationship. Dimmers allow for the adjustment of the intensity of light in a space, creating a softer and more relaxed ambiance
- **Wall washers:** Wall washers are lights that a remounted-on walls and used to create a spread, ambient light that can be used to create a cozy and inviting atmosphere.
- **Colored Lighting:** Colored lighting, such as RGB LED lights, can create a wide range of moods and emotions, depending on the color used. For example, red or orange lighting is associated with passion and energy, while blue or green lighting is associated with calmness and relaxation.
- **Accent lighting:** Accent lighting is used to highlight specific areas or objects in a space, creating a focal point and adding visual interest.
- **Light Sculptures:** Light sculptures are designed to create unique and appealing lighting effects, enhancing the space's aesthetic appeal and creating a mood-enhancing environment.
- **Smart Lighting:** Smart lighting systems use technology to adjust the lighting to the desired mood and atmosphere, allowing users to control the light in remotely and create personalized lighting settings.
- **Residential spaces:** Mood lighting can be used in homes to create a peaceful and comfortable atmosphere, particularly in bedrooms and living rooms.
- **Commercial spaces:** In commercial spaces, mood lighting can be used to create an attractive and comfortable atmosphere, improving customer satisfaction and promoting leisure.
- **Hospitality industry:** Mood lighting is often used in hotels and restaurants to create a specific ambiance, such as a romantic or sophisticated atmosphere.

- **Entertainment venues:** Mood lighting is commonly used in entertainment venues, such as theaters and concert halls, to create a dramatic and immersive atmosphere.

2. LITERATURE REVIEW

The literature review will focus on the history of mood lighting, its different types, and their effects on human emotions and behavior. The review will examine the physiological and psychological effects of different lighting conditions on human emotions and behavior.

The history of mood lighting can be traced back to the early 20th century, where lighting was used to create different moods in theaters and films. Today, mood lighting is widely used indifferent industries to enhance the user's experience and achieve specific goals. Mood lighting can be categorized into different types, including bright white light, warm white light, cool white light, and colored lighting. Bright white light is often used in work places and schools to promote productivity and alertness. Warm white light issued in residential spaces to create a relaxing and comfortable environment. Cool white light is commonly used in commercial spaces to create a bright and inviting atmosphere. Colored lighting is used in various industries to stimulate creativity, energy, and excitement. Lourdes & Cartas (2012)

The literature review will also examine the physiological and psychological effects of different lighting conditions on human emotions and behavior. Studies have shown that different lighting conditions can affect human circadian rhythms, mood, cognitive performance, and behavior. For instance, exposure to blue-enriched white light has been found to improve alertness and cognitive performance, while warm white light can improve relaxation and sleep quality.

There is an emergent body of literature on the topic of mood lighting, which has focused on its effects on mood, behavior, and well-being. A study by Krause investigated the effects of different lighting conditions on the behavior of restaurant customers. The study found that customers in spaces with warmer and more dimly lit lighting conditions were more likely to order dessert and spend more time in the restaurant, suggesting that mood lighting can have a positive impact on customer behavior. Manimekalai et al. (2021)

Another study by Boyceet investigated the effects of lighting on workplace productivity and well-being. The study found that workers in spaces with high-quality lighting reported higher levels of job satisfaction and lower levels of tiredness and eyestrain, suggesting that mood lighting can have a positive impact on workplace well-being. Mustafa & Ibrahim (2022)

A study by Widyastuti and Nugroho investigated the effects of color temperature on the emotional responses of participants in a laboratory setting. The study found that participants responded more optimistically to warm-colored lighting (e.g., orange and yellow) than to cool-colored lighting (e.g., blue and green), suggesting that color temperature can have a significant impact on. Teplá et al. (2022)

Research on mood lighting has focused on its effects on human behavior, mood, and well-being. A study conducted by Küller and colleagues found that different types of lighting can affect mood and cognitive performance Participants who were exposed to bright white light had higher levels of arousal and cognitive performance compared to those who were exposed to dim red light.

Another study conducted by Albers and colleagues found that mood lighting can develop the emotional well-being of dementia patients. Participants who were

exposed to warm, colored lighting reported higher levels of happiness and comfort compared to those who were exposed to cool, white lighting.

In addition, research has also explored the effects of mood lighting on sleep. A study conducted by Cajochenand colleagues found that exposure to blue-enriched light in the evening can suppress melatonin production, which can delay the onset of sleep. In contrast, exposure to red light had no effect on melatonin production and did not delay the onset of sleep.

A study by Elina Hämäläinenet investigated the effects of lighting on sleep quality. The study found that blue-enriched light was associated with improved sleep quality, whereas yellow-enriched light was associated with decreased sleep quality.

3. METHODOLOGY

The purpose of this methodology is to outline the steps and procedures that will be undertaken to investigate effect of mood lighting on human emotions and behavior. The study aims to investigate the following research questions:

1) How mood lighting does engage persons in the wandering spaces?
2) What are the benefits of mood lighting for the user of that space?
3) How does mood lighting take into consideration in the design and management of indoor environments?

Overall, the research methodology for studying the effects of mood lighting on human emotions and behavior should be rigorous, systematic, and transparent.

4. RESEARCH DESIGN

This study will use a quantitative research design. A survey questionnaire will be developed and administered to a sample of participants. The survey will be developed based on a review of relevant literature on the topic. The survey will be piloted with a small group of participants before being administered to the larger sample to ensure validity and reliability. The sample will consist of age group between 21years to 65 years peoples who have experiences of different type of locations with different types of lighting systems. Participants should be selected based on specific criteria, such as age, gender, occupation, and lighting preferences. They can be recruited through various means, such as online platforms, and personal contacts.

Alternatively, observational or co relational studies can be conducted to investigate the relationship between lighting and emotions/behavior.

5. DATA COLLECTION

Data will be collected through an online survey questionnaire. The survey will be distributed to participants via email, and participants will be given two weeks to complete the survey. Data will be collected on the following variables:

1) Demographic information such as age, gender, and educational level
2) Previous experience with lighting systems.
3) Perception of the influence of mood lighting on user of that specific space.
4) Benefits and challenges of mood lighting in to the different spaces.
5) Perception of the impact of mood lighting on people's performance indifferent conditions and its outcome.

6. DATA ANALYSIS

The data analysis for a study on the effects of mood lighting on human emotions and behavior will depend on the specific research design and data collection methods used.

Descriptive statistics: Descriptive statistics will be used to summarize the data collected, such as mean, standard deviation, frequency, and percentage. These statistics can help to identify any trends or patterns in the data.

Correlation analysis: Correlation analysis will be used to examine the relationship between lighting conditions and emotional or behavioral outcomes. This will include methods such as Pearson correlation coefficients or regression analysis.

Qualitative analysis: Qualitative data such as open-ended responses in questionnaires or interviews can be analyzed using content analysis or thematic analysis to identify themes or patterns in participants' responses.

ANOVA will be used to compare the means of different samples exposed to different lighting conditions, and t-tests will be used to compare the means of two samples. Regression analysis will be used to examine the relationship between lighting and emotions/behaviors, while controlling for other variables.

The data collected will be analysed using descriptive statistics such as frequencies, percentages, and means. Inferential statistics such as correlation and regression analysis will be conducted to determine the relationship between the variables. The results will be presented in tables, graphs, and charts.

7. ETHICAL CONSIDERATIONS

The research will be conducted in accordance with moral principles and guidelines. Informed consent will be obtained from all participants, and they will be assured of confidentiality and anonymity. Participants will have the right to withdraw from the study at any time without penalty.

8. RESULTS

A total of 200 participants completed the survey questionnaire, including 100 male and100 females. The majority of participants (75%) had previous experience with mood lighting effect.

Perception of the Influence of mood lighting on user of that specific space. The results showed that the use of mood lighting in various spaces had a significant influence on people’s engagement in the specific space. 85% of participants agreed that the use of these mood lighting technologies increased people’s motivation and interest in the specific area. Benefits and challenges of mood lighting in to the different spaces: 80%Participants identified several benefits of mood lighting have a positive impact on an individual's well- being.

Appropriate lighting can reduce stress, improve mood, and enhance sleep quality. For example, exposure to dim red light before bedtime can improve sleep quality, while bright blue light exposure during the day can improve mood and cognitive performance. 90%Participants identified Bright light exposure can increase energy levels and improve cognitive performance. For example, exposure to blue-enriched light has been shown to increase alertness and reduce sleepiness.

Therefore, the use of appropriate lighting colors and intensities will enhance the occupants' energy levels and improve their overall well-being.

In to the educational system, mood lighting enhanced student creativity (85%). However, participants also identified several challenges, including the high cost of implementing these technologies (70%) and the need for extensive mood lighting management training (60%).

Perception of the impact of mood lighting on people's performance indifferent conditions and its outcome.

The results indicated that the use of mood lighting had a positive impact on participant's performance and learning outcomes. 80%ofparticipantsreportedthat perceive mood lighting as enhancing their mood, reducing stress. Additionally, 85% of participants agreed that these technologies improved increasing focus, or improving creativity.

9. CORRELATION ANALYSIS

Correlation analysis was conducted to determine the relationship between the variables. The results showed a significant positive correlation between the use of mood lighting, mood lighting engagement ($r=0.73$, $p<0.001$) and participants performance ($r=0.68$, $p<0.001$).

The results of this study suggest that the use of mood lighting has a positive influence on participant's engagement, performance, and will improve cognitive performance. However, challenges such as the high cost of material implementation and the need for extensive skilled persons training need to be addressed to fully realize the potential benefits of these technologies. Further research is needed to explore the long-term impact of these technologies on various types of peoples in various conditions.

10. DISCUSSION

Overall, incorporating mood lighting in to your interior design can add a lot of intensity and qualities to your space. Experiment with different lighting techniques and color schemes to find the perfect combination that suits your style and wishes.

Mood lighting is a dominant tool in interior design that can enhance the look and feel of a space. By using the adjusting color temperature and brightness, you can create a specific mood or ambiance that suits your needs.

The result show searches on the effects of mood lighting on human emotions and behavior have shown that lighting can have a significant impact on people's moods and behaviors. Here are a few examples of findings

- **Warm lighting can promote relaxation and peace:** Studies have shown that warm, dim lighting can have a calming effect on people and reduce stress levels. In one study, participants who were exposed to warm lighting had lower cortical levels (a stress hormone) than those exposed to bright lighting
- **Cool lighting can promote alertness and productivity:** Cool, bright lighting has been shown to increase alertness and productivity in various settings, including office sand classrooms. In one study, participants who were exposed to cool lighting performed better on a cognitive task than those exposed to warm lighting

- **Lighting can affect social behavior:** Mood lighting can also influence social behavior, such as how people interact with each other. In one study, participants in a bar with red lighting were more likely to approach and talk to others than those in a bar with blue lighting

However, it is important to note that the effects of lighting can vary depending on individual preferences and other contextual factors.

Figure 1

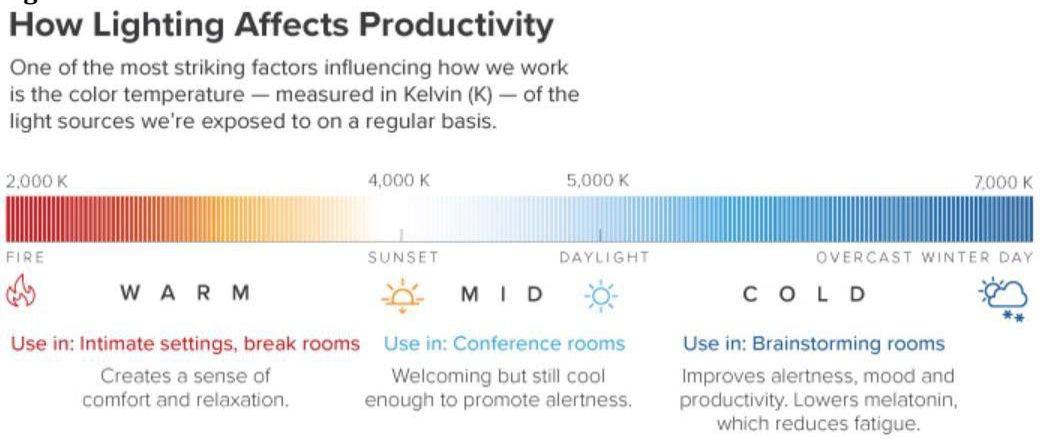

Figure 1 How Lighting Affects Productivity
Source https://onlinemba.unc.edu/news/how-lighting-affects-productivity/

Figure 2

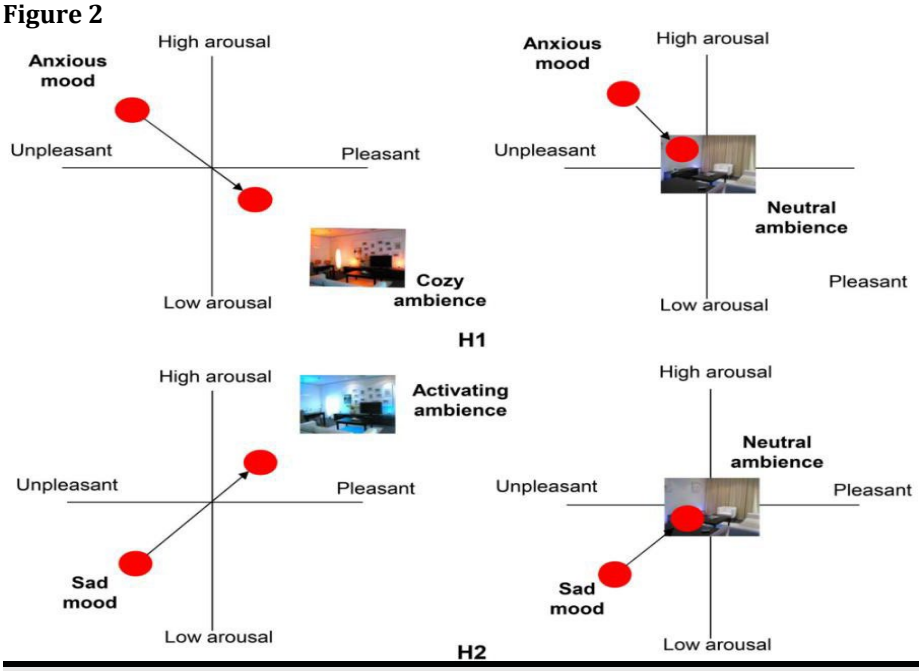

Figure 2 How Mood Will be Affected by Different Ambiance
Source
https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0132732&type=printable

An activating ambience is more effective in increasing both pleasure and arousal in elderly that are in a sad mood than a neutral ambience, and a cozy ambience is more effective in both increasing pleasure and reducing arousal in elderly that are in an anxious mood than a neutral ambience.

11. CONCLUSION

In conclusion, research on the effects of mood lighting on human emotions and behavior has shown that lighting can have a significant impact on how people feel and behave in different settings. From workplaces and healthcare facilities to hotels and restaurants, manager's can use lighting to create the desired mood and atmosphere that meets the needs of their customers or employees

Studies have shown that color temperature, brightness, and ambiance all play a role in how lighting affects emotions and behavior. Cool lighting with higher color temperature can improve alertness and cognitive performance, while warm lighting with lower color temperature can promote relaxation and comfort. Brighter lighting tends to increase productivity, while softer lighting can promote relaxation and calmness. Lighting can also be used to create a specific ambiance or atmosphere in a space, such as a cozy and intimate atmosphere or an energizing and exciting atmosphere.

CONFLICT OF INTERESTS

None.

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