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LIGHT MANIPULATION AND LENS CHOICES: INFLUENCE THE MOOD AND LOOK OF SCENES

Original Article

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ABSTRACT

Background: Lighting manipulation and lens choices are essential components of visual storytelling, widely used in cinematography, photography, and digital media to influence the mood, perception, and emotional engagement of viewers. Scientific research highlights the psychological and physiological effects of light, including its impact on mood, cognitive performance, and visual clarity. Understanding how different lighting conditions and lens variations affect audience perception and narrative depth can enhance creative approaches in visual arts and optimize lighting environments for improved human experience.

Objective: This study aimed to investigate how light manipulation and lens choices influence visual perception, emotional response, and psychological well-being. The research examined the extent to which lighting variations affect mood and whether lens selection alters the viewer's interpretation of a scene. Additionally, the study explored the potential physiological effects of lighting, such as eye strain and discomfort, to provide a comprehensive understanding of its implications.

Methods: A structured survey was conducted among 200 participants, including filmmakers, photographers, visual artists, and the general public. The questionnaire combined close-ended and open-ended questions to assess the impact of lighting intensity, color temperature, and lens types on perception and emotional engagement. The collected data were analyzed using descriptive statistics and thematic analysis, providing both numerical trends and qualitative insights. Statistical evaluation included frequency distribution and comparative analysis of emotional responses to varied lighting and lens setups.

Results: Among participants, 81.7% were aged 18–24 years, while 47.7% represented various professions outside film and photography. A total of 62% of respondents agreed that lighting significantly influenced mood, with 35% reporting that natural light positively impacted emotional stability. Lens choices affected perception for 52% of participants, influencing depth and spatial awareness. Additionally, 14% experienced eye strain or discomfort under specific lighting conditions, highlighting potential physiological effects. Bright lighting was associated with increased alertness by 53%, whereas dim lighting evoked calmness in 41% of cases.

Conclusion: The study confirms that light manipulation and lens choices are crucial in shaping the psychological and perceptual experience of visual media. Lighting significantly impacts mood, cognitive focus, and emotional engagement, while lens selection alters depth perception and scene interpretation. The findings underscore the importance of strategic lighting design in creative industries, architecture, and work environments. Further research should incorporate controlled experimental conditions to better analyze the physiological and cognitive effects of light exposure.

Keywords: Cognition, Contrast Sensitivity, Emotion, Lighting, Photography, Visual Perception, Wakefulness.

INTRODUCTION

Light is an essential component of human existence, permeating every aspect of daily life. Beyond its fundamental role in vision, it significantly influences physiological and psychological states. The interplay between light and color dictates emotional responses, memory associations, and even cognitive functions. Research suggests that specific hues evoke distinct emotional and psychological reactions; for example, blue tones are known for their calming and soothing effects, whereas red tones stimulate energy, passion, and urgency (1). These effects extend into various domains, including medicine, architecture, and visual arts, where lighting plays a crucial role in influencing perception, mood, and behavior. From a physiological perspective, exposure to light modulates circadian rhythms by regulating melatonin secretion, which in turn affects sleep-wake cycles and overall well-being (2). The use of artificial lighting, especially excessive blue light exposure from digital screens, has been linked to disruptions in sleep patterns, increased stress, and negative emotional responses (3). Conversely, natural daylight has been shown to enhance mood, productivity, and cognitive performance, emphasizing the importance of appropriate light exposure in maintaining mental and physical health (4).

In cinematography and photography, lighting is an indispensable tool for visual storytelling, shaping the emotional resonance of scenes and enhancing narrative depth. Well-executed lighting techniques create a sense of realism, heightening immersion and engagement. Studies highlight the importance of lighting in eliciting emotional responses, as different lighting schemes convey distinct moods. High-key lighting, characterized by even illumination and minimal shadows, typically evokes positive emotions such as joy, excitement, and warmth. In contrast, low-key lighting, defined by deep shadows and high contrast, generates suspense, mystery, or even fear (5). Moreover, the direction, intensity, and color temperature of light influence audience perception by guiding visual focus and reinforcing thematic elements within a frame (6). Beyond filmmaking, architectural lighting significantly alters the perception of space. A well-lit environment can make a confined area appear spacious, whereas dim lighting can make an expansive room feel smaller and more intimate (7). Similarly, lighting design in indoor spaces affects individuals' emotional states, with warmer tones fostering comfort and relaxation, while cooler tones enhance alertness and concentration (8).

The lens, another fundamental component of visual representation, determines how scenes are perceived and interpreted. A lens can distort, magnify, or narrow visual fields, influencing spatial perception and depth. In digital image forensics, lens radial distortion serves as a unique identifier for source camera recognition, showcasing the scientific precision associated with lens technology (9). Lens choices in cinematography and photography affect perspective, mood, and storytelling. Wide-angle lenses exaggerate depth, creating a sense of expansiveness and often evoking unease or grandeur, while telephoto lenses compress depth, isolating subjects and fostering a sense of intimacy (10). Camera placement and lens selection are as critical as lighting in shaping narrative intention. Studies demonstrate that images with lighter exposure tend to be perceived as friendly and inviting, while darker compositions are associated with seriousness or malevolence (11). These principles underline the interconnectivity of light and lens choices in constructing meaning within visual media.

The psychological impact of lighting extends beyond artistic applications, influencing cognitive function, sleep quality, and overall well-being. Medical research indicates that lighting conditions significantly affect human physiology and behavior. Exposure to bright light, particularly in the morning, enhances cognitive function, alertness, and mood by suppressing melatonin and increasing serotonin levels (12). Conversely, prolonged exposure to artificial light at night disrupts circadian rhythms, increasing the risk of mood disorders, sleep disturbances, and cardiovascular conditions (13). The correlation between light exposure and emotional health is well-documented; individuals exposed to natural light exhibit lower stress levels, reduced symptoms of depression, and improved cognitive performance compared to those in artificially lit environments (14). Moreover, artificial lighting, especially high-intensity or flickering light sources, can cause physical discomfort, including headaches, eye strain, and fatigue, indicating the need for optimal lighting design in workspaces, hospitals, and residential settings (15).

Scientific advancements in emotion recognition and neuroscience have further established the profound influence of lighting on human emotions. Film studies demonstrate that lighting directly shapes audience reactions, with high-key lighting enhancing positive affect and low-key lighting reinforcing negative affect (16). The interplay between light and color temperature is critical in visual media, as warm hues evoke comfort and nostalgia, while cool tones instill a sense of detachment or melancholy (17). Additionally, research on interior lighting design underscores its psychological and physiological effects, with dynamic lighting solutions emerging as a promising approach to enhancing mood, productivity, and sleep hygiene (18). The preference for natural over artificial light is particularly relevant in architectural design, where access to daylight has been associated with increased serotonin production, reduced anxiety, and improved cognitive function (19). Studies have further revealed that individuals exposed to higher levels of nighttime artificial light are at greater

risk of psychiatric disorders, including depression, anxiety, and bipolar disorder (20). These findings emphasize the necessity of integrating natural light exposure into daily routines as a preventive measure for mental health.

Color, an extension of light, holds significant psychological and behavioral implications. Research indicates that different color wavelengths influence physiological responses, altering hormone secretion, energy levels, and mood states (21). Bright, saturated colors with longer wavelengths, such as red and orange, stimulate arousal and excitement, while muted, cool colors like blue and green induce relaxation and mental clarity (22). These principles are extensively applied in marketing, interior design, and entertainment, demonstrating the cross-disciplinary impact of color psychology. The additive and subtractive color mixing systems provide a framework for understanding how colors interact and influence perception, guiding artistic and design choices in various fields (23). Furthermore, experimental studies on correlated color temperature reveal that cooler lighting enhances cognitive performance on complex tasks, while warmer lighting fosters relaxation and social engagement (24). Such insights underscore the importance of strategic lighting and color design in creating optimal environments for diverse applications.

Despite the clear scientific and artistic implications of lighting and lens choices, gaps remain in the understanding of their combined impact on human perception and emotional response. This research aims to bridge these gaps by investigating how lighting techniques and lens choices influence the mood and visual impact of scenes. By integrating insights from neuroscience, cinematography, and architectural design, this study seeks to provide a comprehensive analysis of the physical and psychological effects of light manipulation. The objective is to elucidate the mechanisms through which lighting and lens choices shape human experiences, offering practical applications for filmmakers, designers, and healthcare professionals. Through this exploration, the study aims to highlight the significance of informed lighting practices in enhancing well-being, optimizing environments, and fostering deeper emotional connections within visual media.

METHODS

This study examined the impact of light manipulation and lens choices on the mood and perception of visual scenes through a structured survey-based approach. The research employed both qualitative and quantitative methodologies to ensure a comprehensive understanding of how these visual elements influence psychological and physiological states. A structured questionnaire was developed to collect data, incorporating a combination of close-ended and open-ended questions. The close-ended questions were designed to provide measurable trends in lighting preferences, emotional responses, and perception, while the open-ended questions allowed participants to elaborate on personal experiences, offering deeper insights into the subjective effects of lighting and lens choices.

To enhance accessibility and reach a diverse pool of participants, the survey was distributed online. Participants were provided with a clear explanation of the study's purpose, along with an estimated completion time of 10–15 minutes to facilitate thoughtful responses. Ethical considerations were upheld, ensuring voluntary participation, informed consent, and anonymity. The sample population included individuals from varied backgrounds, including filmmakers, photographers, visual artists, and the general public, to capture a broad spectrum of perspectives on lighting and lens usage. Given the study's focus on emotional and physical responses to lighting conditions, the survey incorporated questions addressing the impact of both natural and artificial light on mood, cognitive performance, and visual aesthetics.

Data analysis was conducted using a combination of statistical and thematic approaches. Quantitative data from close-ended questions were analyzed using descriptive statistical methods to identify patterns and trends in participant responses. The frequency of certain lighting preferences, emotional reactions to different lighting setups, and the perceived effectiveness of lens choices in influencing visual storytelling were systematically evaluated. Qualitative data obtained from open-ended responses underwent thematic analysis, which involved coding recurring themes to provide a more nuanced understanding of participants' experiences and perceptions. This mixed-methods approach facilitated a more holistic exploration of how light manipulation and lens selection contribute to the psychological and physiological effects of visual environments.

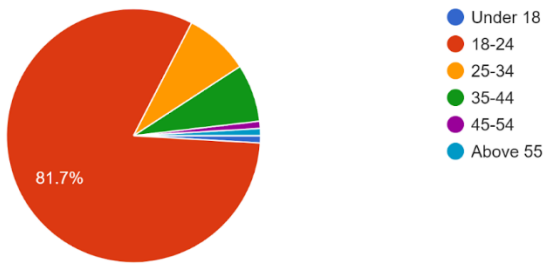
A potential limitation of the methodology was its reliance on self-reported data, which may introduce subjective biases. While the study aimed to capture authentic personal experiences, variations in individual perception and environmental factors may have influenced responses. Additionally, the study did not control for external variables such as participants' prior exposure to professional lighting setups, ambient lighting conditions at the time of survey completion, or potential placebo effects associated with self-awareness of

lighting preferences. Future research could incorporate experimental approaches, such as controlled lighting environments, to further validate findings and establish causal relationships between lighting conditions and emotional or physiological responses.

RESULTS

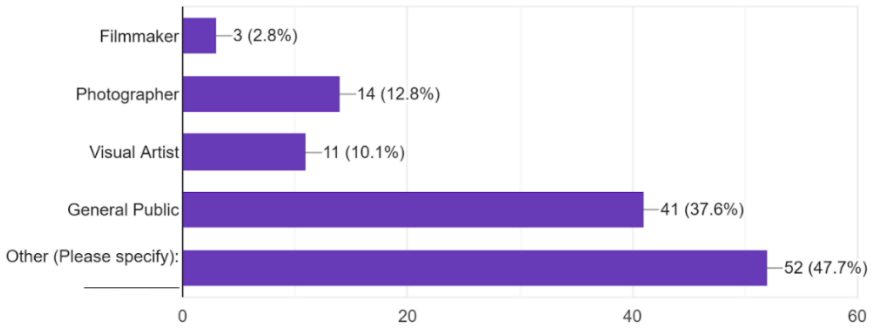
The analysis of the survey responses provided insights into the demographic distribution of participants and their perspectives on light manipulation and lens choices. The majority of respondents (81.7%) fell within the 18 to 24 age group, followed by 8.3% between 25 to 34 years, 7.3% between 35 to 44 years, and a minimal representation from older age groups, with 0.9% each for 45 to 54 years, above 55 years, and under 18 years. Regarding professional backgrounds, 2.8% identified as filmmakers, 12.8% as photographers, 10.1% as visual artists, 37.6% as general public, and the largest group (47.7%) belonged to other occupations. These demographic factors provided a diverse foundation for analyzing perspectives on the psychological and physical effects of lighting and lens choices.

In terms of perceptions of lighting and its emotional impact, 39% of respondents agreed that lighting significantly influences mood, while 23% strongly agreed. Conversely, 8% strongly disagreed, 5% disagreed, and 25% remained neutral. Regarding lighting's role in shaping the visual and psychological appeal of a scene, 35% agreed, and 30% strongly agreed, whereas 9% strongly disagreed, 5% disagreed, and 21% were neutral. A substantial proportion (36%) acknowledged the impact of lighting choices on emotional perception, with 21% strongly agreeing and 12% strongly disagreeing. Additionally, 36% of respondents confirmed that light manipulation affects storytelling, while 24% were neutral, and 8% expressed disagreement. The interplay between lighting and lens choices was further emphasized, as 34% agreed and 18% strongly agreed that lens selection significantly influences visual narratives. However, 10% strongly disagreed, 11% disagreed, and 27% remained neutral. The data consistently highlighted the crucial role of lighting and lens selection in determining mood, emotional connection, and viewer engagement in visual storytelling.



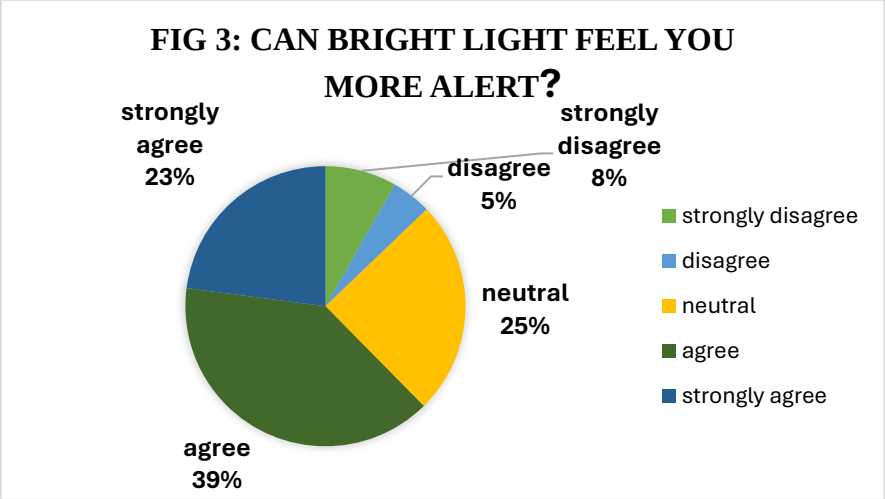
The figure shows that 81.7% of the respondent are in the age of 18 to 24, 8.3% of the respondent are lie in the age between 25 to 34, 7.3% of the respondent are in the age between 35 to 44, 0.9% of the respondent are in the age between 45 to 54, 0.9% of the respondent are above 55 and 0.9% of the respondent is under 18.

Figure 1 Age

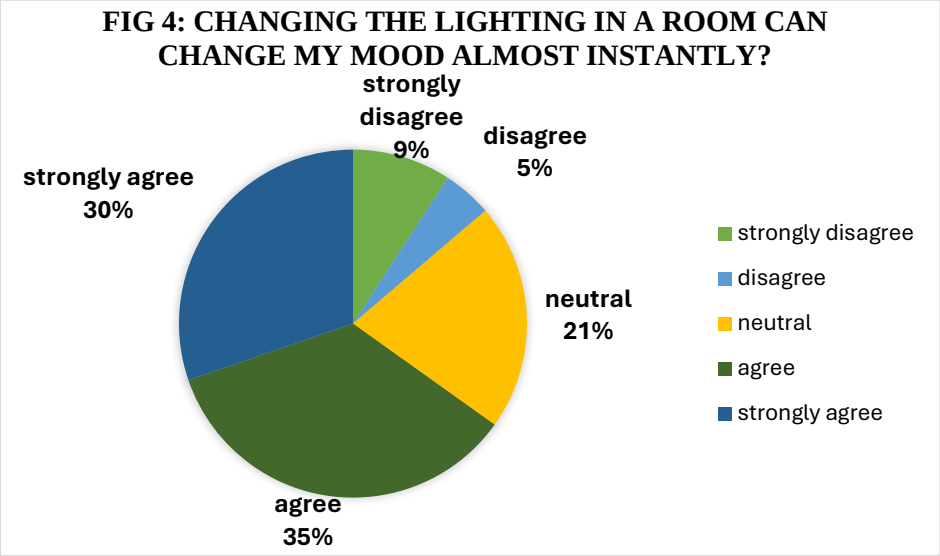


The graph show that 2.8% of the respondent are filmmaker, 12.8% of the respondent are photographer, 10.1% of respondent are visual artist, 37.6% of respondent are general public and 47.7% of respondent are others category.

Figure 2 Occupation

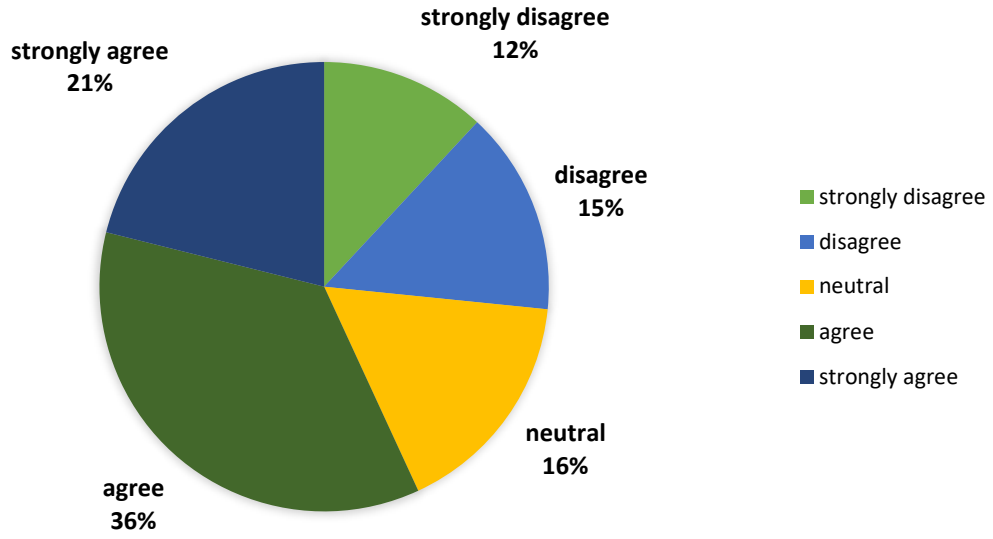


The figure illustrates that 39% of the respondent are agree, 23% of the respondent are strongly agree, 8% of the respondent are strongly disagree, 5% of the respondent are disagree and 25% respondent are neutral.



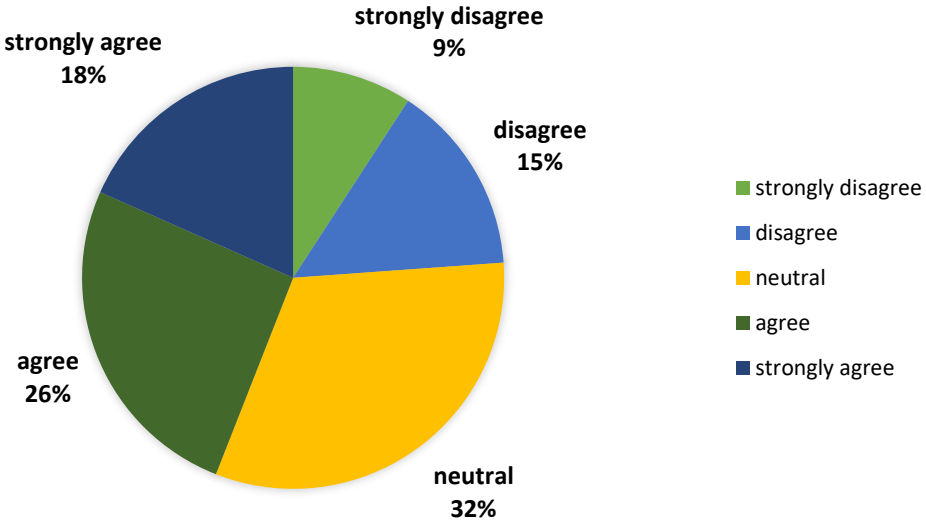
The figure shows that 35% of the respondent are agree, 30% of the respondent are strongly agree, 9% of the respondent are strongly disagree, 5% of the respondent are disagree and 21% of the responded or neutral.

FIG 7: DO YOU FIND THAT DARK OR DIM LIGHTING CREATES SPECIFIC EMOTIONS, SUCH AS SADNESS OR CALMNESS?



The figure shows that 39% of the respondent are agree, 30% of the respondent are strongly agree, 10% of the respondent are strongly disagree, 6% of the respondent are disagree and, 15% of the respondent are neutral.

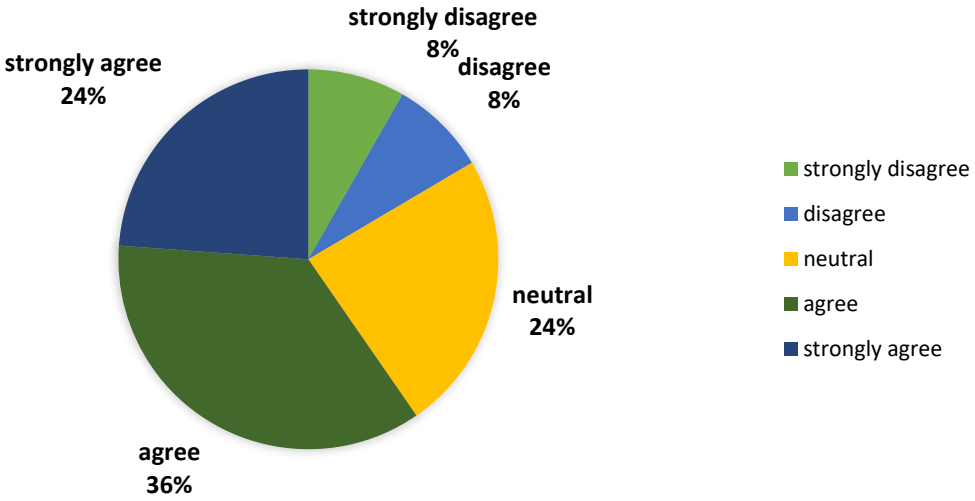
FIG 6: FLUORESCENT LIGHTS CAUSE ME PHYSICAL DISCOMFORT, LIKE HEADACHES OR EYE STRAIN.



The figure shows that 26% of the respondent are agree, 18% of the responded are strongly agree, 9% of the respondent are strongly disagree, 15% of the respondent are disagree and 32% of the respondent are neutral.

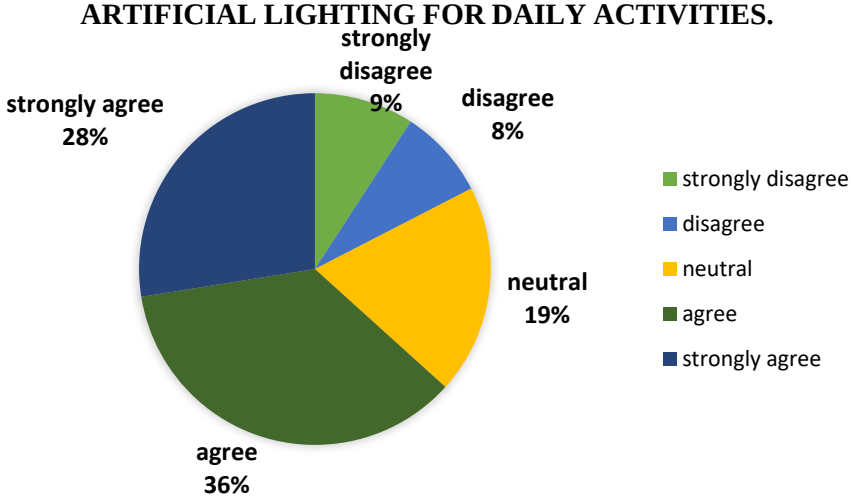
The chart shows that 36% of the respondent are agree, 21% of the respondent are strongly agree, 12% of the respondent are strongly disagree, 15% of the respondent are disagree and 16% of the respondent or neutral.

FIG 8: I NOTICE THAT MY MOOD IMPROVES WHEN I SPEND TIME IN WELL LIGHTED ENVIRONMENT.



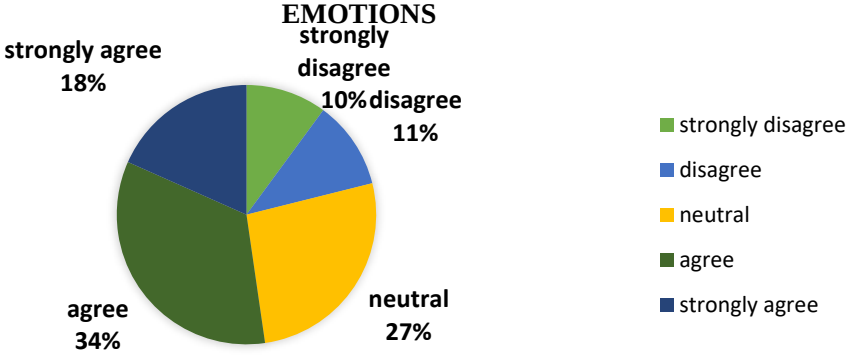
The chart shows that 36% of the respondent are agree, 24% of the respondent are strongly agree and neutral and 8% of the respondent are disagree and strongly disagree.

FIG 9: I PREFER NATURAL LIGHTING TO ARTIFICIAL LIGHTING FOR DAILY ACTIVITIES.



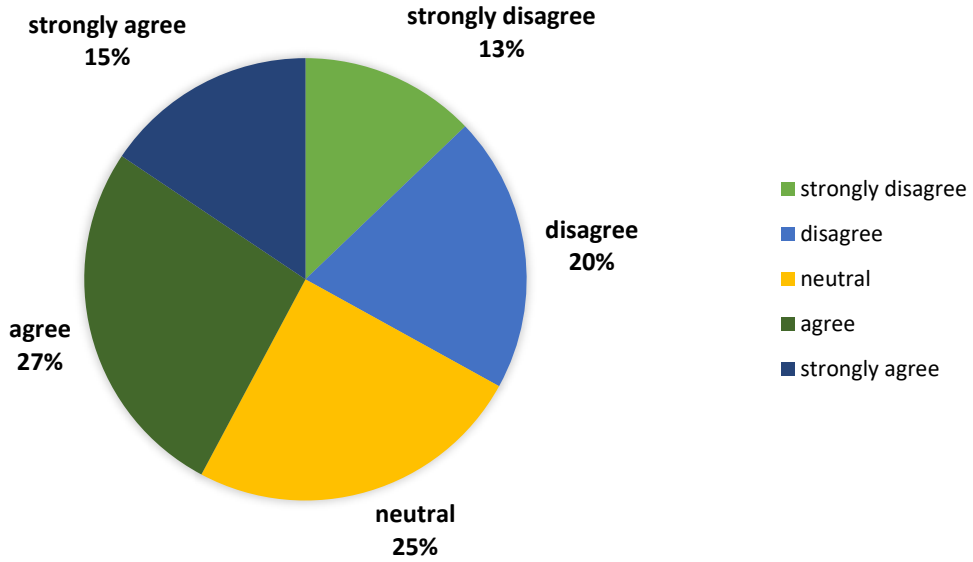
The pie chart shows that 36% of the respondent are agree, 28% of the responded are strongly agree, 9% of the respondent are strongly disagree, 8% of the respondent are disagree and, 19% of the respondent or neutral.

FIG 10: WHEN LOOKING AT PHOTOS OR FILMS, DO I FEEL DIFFERENT TYPES OF LIGHTING EVOKE DISTINCT EMOTIONS



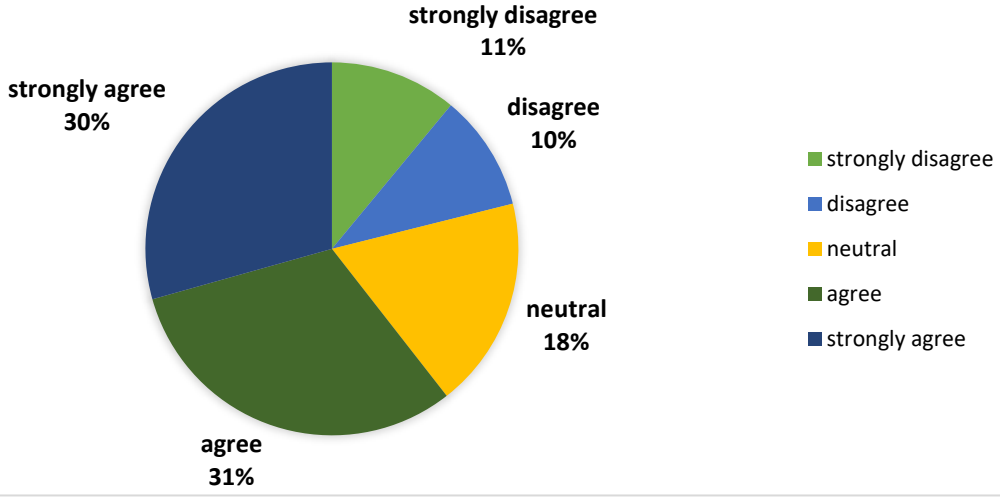
The pie chart show that 34% of the respondent are agree, 18% of the respondent are strongly agree, 10% of the respondent are strongly disagree 11% of the respondent are disagree and 27% of the respondent are neutral.

FIG 11: CAN LOW LIGHT LEVEL EFFECTS MY PERFORMANCE



The figure illustrates that 27% of the respondent are agree, 15% of the respondent are strongly agree, 13% of the respondent are strongly disagree, 20% of the respondent are disagree and 25% of the respondent are neutral.

FIG 12: ARTIFICIAL LIGHTING (SUCH AS LED OR SCREEN LIGHTS) IMPACT YOUR SLEEP QUALITY?



The chart shows that 31% of the respondent are agree, 30% of the respondent are strongly agree, 11% of the respondent are strongly disagree, 10% of the respondent are disagree and 18% of the respondent or neutral.

DISCUSSION

The findings of this study demonstrate that light manipulation and lens choices play a significant role in influencing both the psychological and perceptual aspects of visual experiences. The results aligned with prior research, indicating that exposure to bright light enhances alertness by stimulating the brain and suppressing melatonin production, a hormone responsible for regulating sleep-wake cycles. This reinforces the established role of lighting in modulating cognitive and emotional states, particularly in environments where maintaining concentration and wakefulness is crucial, such as workplaces and educational institutions (23). Additionally, the psychological impact of lighting was evident, as variations in brightness, color temperature, and intensity were found to elicit immediate emotional responses. Warmer tones were associated with relaxation and comfort, while cooler tones promoted focus and attentiveness (24). These findings support the notion that lighting is intentionally designed and manipulated in various fields, including cinematography, photography, and architecture, to evoke specific emotional responses (25). The preference for natural light over artificial lighting further highlighted the positive impact of daylight exposure on psychological well-being. Research suggests that

natural light enhances serotonin production, a neurotransmitter linked to mood regulation, contributing to emotional stability and overall mental health (26). Moreover, the application of lighting principles in architectural design plays a crucial role in shaping human interactions with spaces, reinforcing the importance of optimized lighting environments to enhance well-being and productivity (27).

Despite the psychological influences of lighting, the study findings suggested that lighting also contributes to physical effects, although these aspects were not comprehensively examined in the collected data. The presence of discomfort among some respondents indicated that exposure to specific lighting conditions, such as flickering lights or excessive brightness, may induce physiological effects, including eye strain and headaches (28). However, as this research did not specifically measure physiological responses, further investigation is required to validate these associations (29). Existing literature suggests that extended exposure to artificial lighting, particularly blue light emitted from screens, disrupts circadian rhythms and contributes to cognitive fatigue, emphasizing the need for well-balanced lighting systems (30). The limitations of this study include the reliance on self-reported data, which introduces a degree of subjectivity and potential response bias (31). While the survey effectively captured emotional and perceptual responses to lighting, the absence of controlled environmental conditions limited the ability to establish direct physiological correlations (32). Additionally, the diverse participant pool, while advantageous in providing varied perspectives, may have led to inconsistencies in individual interpretations of lighting effects (33). Future research should consider integrating experimental methodologies, such as controlled lighting environments and physiological monitoring, to further examine the interaction between light exposure and human health (34).

The study underscores the broader implications of lighting design in visual storytelling, emphasizing its influence on audience perception and emotional engagement. In cinematography, lighting techniques are strategically employed to convey mood, establish ambiance, and enhance narrative depth (35). High-key lighting is commonly associated with uplifting emotions, while low-key lighting creates suspense and psychological intensity (36). Similarly, in architectural and interior design, lighting configurations shape the ambiance of a space, affecting not only mood but also behavior and performance (37). The findings suggest that optimizing lighting conditions can be a valuable tool in various industries, from healthcare and education to workplace design, where tailored lighting solutions may enhance cognitive function, reduce stress, and improve overall well-being (38). While this research provides valuable insights into the emotional and perceptual dimensions of lighting, further interdisciplinary studies are necessary to bridge the gap between psychological and physiological effects (39). Addressing the physical implications of light exposure, including its potential impact on vision, neurological health, and circadian regulation, remains a crucial area for future investigation (40). By integrating advancements in neuroscience, behavioral psychology, and lighting technology, future research can contribute to the development of evidence-based lighting strategies that enhance both visual aesthetics and human health (41,42,43).

CONCLUSION

The study's exploration into the effects of light manipulation and lens choices reveals the profound influence these elements have on both mood and visual perception. By delving into how lighting shapes emotions and physical well-being, the findings underscore the critical role of thoughtful lighting design in crafting compelling visual narratives and enhancing everyday environments. Participants' responses suggested that bright lighting contributes to alertness and cognitive engagement, while natural lighting fosters a sense of well-being and emotional stability. Conversely, poorly designed lighting can lead to discomfort, such as headaches and eye strain, highlighting the importance of balancing light intensity and quality. The psychological effects were also evident, with darker environments evoking emotions tied to calmness or melancholy, and well-lit spaces linked to comfort and positivity. These insights emphasize that lighting transcends its technical function to become a powerful tool for connecting with audiences and improving human experiences. Whether in artistic endeavors or practical applications, intentional lighting choices can foster happier, more productive, and more immersive environments, ultimately enriching people's interaction with their surroundings. This research calls for a mindful approach to lighting, advocating for designs that maximize its potential to positively influence both emotional and physical realms.

Author Contribution

Author	Contribution
Zubeda Bhatii	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Humera Omer Farooq	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Nusrat Azeema*	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Nabeeha Shahid	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Asfand Yar Amir	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Alif Hossen Sany	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

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