CHAPTER 3
THEORETICAL AND PRACTICAL ASPECTS OF MODERN PSYCHOLOGY

THE INFLUENCE OF COLOR ON THE PSYCHO-EMOTIONAL STATE OF INDIVIDUALS ACROSS DIFFERENT AGE PERIODS

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Abstract. *The article explores the psycho-emotional impact of color on individuals at various stages of life, emphasizing the variability of emotional responses based on age. The primary objective of the study is to determine how individuals of different age groups perceive and emotionally respond to various color stimuli. The relevance of this topic is driven by the increasing role of visual environments in everyday life, which requires psychological understanding to optimize spaces for emotional comfort. The study is timely given the intensified sensory loads experienced by people in contemporary settings, as well as the rising demand for emotionally adaptive environments. The methodology integrates quantitative and qualitative tools to assess color perception in three age groups—children, young adults, and elderly individuals. Techniques include the Lüscher Color Test, the PANAS scale, and systematic observation of verbal and non-verbal responses to standardized color stimuli. The experimental design ensures consistent lighting, neutral backgrounds, and controlled exposure conditions. All sessions were conducted ethically, with informed consent and attention to emotional safety, especially for minors and elderly participants. The study's findings reveal significant age-dependent patterns in color preferences and emotional responses. Children react impulsively to bright, warm colors, which often enhance positive affect and elicit vivid associations. Young adults show more balanced emotional reactions, engaging in symbolic interpretations and aesthetic reflection. Older individuals prefer calm, desaturated hues, linking them to personal memories, emotional stability, and life experience. Non-verbal responses also vary: expressive in children, restrained in youth, and contemplative in the elderly. These results underscore the evolving nature of color perception throughout ontogeny. The study provides insights for art therapy, gerontology, and sensory psychology, contributing to a more human-centered approach in space planning, mental health interventions, and emotional well-being strategies.*

Keywords: *color perception, age-specific differences, psycho-emotional state, emotional response, sensory psychology, color preferences, non-verbal behavior, affect regulation.*

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Introduction. The relevance of this research stems from the growing interest in color perception as a significant factor influencing the psycho-emotional state of individuals throughout ontogenetic development. In today's visually saturated environment-where color plays a crucial role in shaping educational spaces, interior design, visual communication, and digital interfaces-understanding how different age groups emotionally respond to specific colors becomes increasingly important. Color is capable not only of evoking aesthetic impressions but also of altering emotional states, eliciting arousal or calm, shaping attitudes toward objects, and in some cases, even influencing decision-making. These characteristics of color demand thorough scientific analysis within the framework of psychology, particularly in the context of age-related differences in perception and its impact on emotional processes. Given the fast-paced nature of modern life, the growing psycho-emotional load on various age groups, and the need to create psychologically comfortable environments, studying color as a tool for optimizing emotional well-being, preventing stress, and regulating mood is of particular relevance. It is essential to emphasize that sensitivity to color, the richness of associative meaning, and emotional responses to color evolve with age, necessitating a differentiated approach to the study of this psychophysiological phenomenon.

Literature review. The psychological impact of color has been a longstanding subject of empirical inquiry within global psychological science. Faber Birren (1978) was among the earliest scholars to provide a scientifically grounded explanation of the psychophysiological effects of color on human perception and behavior. Building on foundational principles, Wright (2009) developed a structured psychological model—the Colour Affects System—which links specific color responses to personality types and temperamental differences.

Research by Kwallek, Soon, and Lewis (2007) demonstrated that the visual environment of office interiors, including wall colors, could significantly influence employee emotional well-being and productivity. From the perspective of cognitive psychology, Goldstein (2021) emphasized the neurophysiological and cognitive mechanisms that underlie color perception. Complementarily, Elliot (2015) investigated how specific colors, particularly red, affect motivation and emotional arousal in academic contexts, drawing attention to measurable performance outcomes.

In recent years, a large-scale cross-cultural study led by Jonauskaite et al. (2024) explored color-emotion associations across 31 countries, analyzing data from adults aged 16 to 88. This comprehensive analysis highlighted the universality of emotional responses to certain colors, while also revealing age- and culture-specific nuances in emotional perception. Although these findings offer substantial evidence of color's impact on psycho-emotional states, there remains a gap in research regarding age-differentiated responses to color stimuli.

Within Ukrainian psychological science, growing interest has mirrored global trends. For instance, Andrushko and Yasinskyi (2014, 2018) examined the influence of primary colors—such as red and yellow—on emotional states, identifying consistent psycho-emotional reactions to chromatic stimuli. In addition, studies by Shypova and Vovk (2020) and by Petrenko and Chelombitko (2021) focused on the broader

emotional and cognitive implications of color exposure in both experimental and applied contexts.

The age-specific dimensions of color perception have also been addressed in recent Ukrainian scholarship. Davydova (2021) investigated how color influences cognitive activity and emotional well-being in children, while Kisilevych and Korotsynska (2024) explored the effects of color stimuli on cognitive functioning in middle-aged adults. These studies collectively underscore the importance of integrating age as a variable in research on color psychology, providing a more differentiated understanding of individual responses to visual stimuli.

These studies provide a substantial theoretical foundation for understanding the impact of color on the psycho-emotional state. However, the topic calls for further exploration, particularly through a systematic analysis of age-related differences in color influence. To date, the specific features of color perception across life stages (childhood, adolescence, adulthood, and old age) and its effects on emotional well-being remain insufficiently studied.

The issue of color's impact on the psycho-emotional state of individuals has gained particular relevance within the context of contemporary research in sensory psychology, developmental psychology, and applied psychodiagnostics. In light of the growing interest in visual environments as factors in emotional regulation, it becomes increasingly important to investigate not only general patterns but also age-specific differences in color perception. Therefore, an empirical study that combines quantitative and qualitative analysis is essential to capture the specificity of emotional responses to color stimuli across various age groups.

Aims. The aim of this study is to identify age-specific features of psycho-emotional responses to color stimuli, which, in turn, enables the discovery of consistent patterns in the perception of color as a unique psychophysiological phenomenon.

Among the objectives of this research is the interpretation of color-related emotional responses in the context of age-specific psychological development, encompassing changes in sensory, cognitive, and emotional functioning. The study focuses on three key age groups-childhood, youth, and old age-and aims to reveal how color is perceived at each of these stages, which hues are associated with positive or negative emotional tones, how sensory sensitivity to color changes with age, and to what extent cognitive color-association schemas are formed in different age cohorts.

The hypothesis of this study is based on the assumption that age differences in psycho-emotional reactions to color stimuli are statistically significant and multifaceted in nature. This includes not only changes in emotional evaluations of certain colors but also transformations in sensory sensitivity, accompanied by shifts in emotional-motivational responses and cognitive color stereotypes. In childhood, emotional reactions are typically impulsive and direct, with bright colors provoking strong positive or negative impressions due to the immaturity of neural regulatory mechanisms. In adolescence, psycho-emotional responses become more rational, while retaining heightened sensory sensitivity and empathic responsiveness to color signals. In old age, there is a noticeable decline in visual acuity and emotional expressiveness in response to color stimuli; however, this is often compensated for by a richness of

life experience and stable associative connections. It is expected that the findings will confirm: children predominantly react emotionally to bright and warm colors; young people exhibit a more differentiated attitude toward color; and older individuals demonstrate stable color preferences, closely tied to nostalgic or adaptive emotional defense mechanisms. Overall, the hypothesis reflects the understanding that color perception is a dynamic psychological process, sensitive to age-related transformations of personality.

Methodology. The study was conducted on a sample of 30 participants evenly distributed across age groups. The first group included children aged 6–8 years (10 participants), the second group consisted of young adults aged 18–22 (10 participants), and the third group comprised elderly individuals aged 60 and older (10 participants). Gender distribution was balanced, with equal representation of males and females within each category. All participants provided informed consent; for minors, written permission was obtained from their parents. Participants had no diagnosed visual impairments or mental disorders that could significantly influence color perception.

To achieve the research aim and test the stated hypothesis, a set of complementary methods was employed, encompassing both qualitative and quantitative approaches to the analysis of psycho-emotional responses to color stimuli across age groups. Theoretical methods included the analysis and synthesis of scientific literature on the psychology of color. Among the empirical methods used were the Luscher Color Test to assess emotional reactions to color, self-report questionnaires (PANAS scale) to evaluate emotional state, and behavioral observation techniques. For data processing, mathematical statistics methods were applied, including comparative analysis, correlation analysis, and analysis of variance (ANOVA) to identify statistically significant differences between age groups.

The central instrument in this study was the Lüscher Color Test, which enabled the assessment of preferences, internal conflicts, and emotional dispositions based on participants' sequential selection of color cards. This method made it possible to identify deep psychological processes inferred from participants' intuitive choices during the ranking of colors, without requiring verbalization of emotional states-an approach particularly valuable when working with children or elderly individuals. The results were interpreted using both the classical framework and age-adapted scales that reflect the developmental characteristics of the affective domain at each stage of ontogenesis.

As a complementary tool, the PANAS questionnaire was employed to provide a more controlled measurement of positive and negative affect through self-reporting. Participants completed the questionnaire both before and after the presentation of color stimuli, allowing for the tracking of emotional state dynamics and assessment of the extent to which color exposure influenced subjective well-being. This instrument proved especially effective with the youth group, whose participants demonstrated sufficient levels of reflexivity and verbal competence to accurately express their emotional states in the responses. The questionnaire thus facilitated a quantitative analysis of shifts in psycho-emotional background induced by color exposure and helped verify the influence of each basic color.

The visual stimuli consisted of a set of standardized color cards representing eight primary colors: red, blue, green, yellow, purple, brown, black, and gray. Each color was presented against a white background under uniform lighting conditions to minimize perceptual distortion. The sequence of color presentation was fixed, and participant responses were recorded immediately upon exposure. Both verbal comments and non-verbal reactions-such as facial expressions, postural changes, smiling, or hesitation-were assessed. This integrated observation allowed for the identification of non-verbal markers of emotional arousal, anxiety, or disengagement.

Observation of non-verbal behavior was conducted without instrumental recording but followed a structured protocol for noting behavioral indicators accompanying the testing process. These included facial muscle tension, gaze aversion, postural shifts, clenched hands, micro-expressions (such as subtle smiles), as well as signs of concentration, emotional withdrawal, or repetitive mechanical movements. This method was particularly informative in the case of children, who may struggle to verbalize their emotional experiences yet actively display affective reactions through behavior. The analysis of non-verbal cues was guided by widely accepted psychological indicators of emotional states, thereby enhancing the validity of the collected data.

To ensure the objectivity of the findings and facilitate statistical generalization, methods of mathematical statistics were applied. Correlation analysis was used to identify relationships between color preferences and levels of affective tone. Analysis of variance (ANOVA) enabled comparison of mean scores across the three age groups and the testing of the hypothesis concerning statistically significant differences. Statistical processing of results was performed using electronic spreadsheets and software tools, which helped reduce subjective bias and increased the reliability of empirical conclusions.

The research was organized through a clearly structured, multi-stage design aimed at ensuring the validity**,** reliability, and ethical integrity of the empirical investigation into psycho-emotional responses to color stimuli across different age groups.

The first stage involved thorough preparation of the research instruments, including the adaptation of the Lüscher Color Test to the study conditions, preparation and standardization of the color card set, printing of PANAS questionnaire forms, and the development of a structured observation protocol for recording non-verbal reactions. Simultaneously, the sample was formed, comprising 30 participants evenly divided into three age groups: children (6–10 years), young adults (18–25 years), and older adults (60–75 years). All participants, or their legal guardians in the case of minors, signed informed consent forms. This complied with ethical standards for psychological experimentation, including confidentiality, voluntary participation, and the right to withdraw.

The second stage involved the direct diagnostic procedures. Each participant underwent an individual session lasting between 20 and 30 minutes, conducted in a quiet environment with stable natural lighting to minimize external influences that might distort color perception or provoke unintended emotional reactions. Each session

began with a brief orientation to the research procedure to reduce anxiety and establish a supportive atmosphere. This was followed by an initial assessment of emotional state using the PANAS questionnaire. Then, color cards were presented in random order, and the participant's immediate reaction-verbal, emotional, or behavioral-was recorded for each color. After the presentation, the PANAS questionnaire was completed again to track changes in emotional state. Throughout the procedure, the researcher maintained an observation protocol, documenting non-verbal expressions that complemented the quantitative data.

The third stage focused on data processing and analysis. This included organizing the results into tables, calculating mean values for each indicator, constructing comparative charts, and identifying trends in color preferences by age. Special attention was given to comparing pre- and post-exposure PANAS data to determine which colors elicited emotional shifts within each age group. In addition, a qualitative analysis of in-session behaviors was conducted to identify recurring patterns characteristic of specific age cohorts. This structured approach contributed to a high degree of procedural standardization and minimized the risk of subjective bias. As a result, the study provided a robust empirical foundation for generalizations and conclusions regarding age-related differences in the perception of color as both a sensory and emotional stimulus.

Throughout the organization and implementation of the empirical research, strict adherence to ethical principles governing psychological practice and scientific inquiry was maintained. In accordance with fundamental research ethics, all participants were fully informed of the study's purpose, nature, and procedures. Informed consent was a prerequisite for inclusion in the sample. Adult participants signed written consent forms, while for children, consent was granted by a parent or legal guardian, accompanied by the child's verbal agreement. This ensured not only the legal legitimacy of the study but also demonstrated respect for personal autonomy regardless of age.

At every stage, voluntary participation was emphasized, including the right to withdraw at any time without negative consequences. Participants were also informed of their right to skip individual questions or refuse parts of the procedure if they experienced discomfort. Particular care was taken to ensure data confidentiality: all records were anonymized using coded identifiers with no reference to personal information, and data analysis was conducted in aggregated form only. In public presentations of findings, only depersonalized and statistically processed results were used, eliminating any possibility of participant identification.

An essential component of the ethical framework for this study was the engagement with children and elderly participants. In these groups, the researchers adhered to heightened ethical standards, taking into account potential sensitivity to the research setting. For children, a playful and friendly environment was created to reduce anxiety and foster a sense of trust. In the case of elderly respondents, the sessions were conducted under maximally comfortable conditions, adjusted to each individual's pace, health status, hearing and vision capacities, energy level, and cognitive accessibility of

instructions. In both groups, psychological support was available in the event of even minor emotional discomfort.

Additionally, attention was paid to ensuring ecological validity-the experimental setting was not to artificially disrupt the participants' usual emotional state. Therefore, testing was conducted in a neutral, non-intrusive environment free of excessive stimuli. All color stimuli were presented under natural lighting conditions to minimize visual strain and prevent distortions in color perception due to environmental factors. Owing to these clearly defined ethical guidelines, the study was implemented with maximum care for the psycho-emotional well-being of each participant, in full accordance with the principles of humanism, professional responsibility, and academic integrity.

The developed empirical research methodology offers a comprehensive approach to examining the psycho-emotional effects of color across different age periods. The use of validated psychodiagnostic tools, integration of quantitative and qualitative analyses, stratified sampling, and strict adherence to ethical standards contribute to the reliability and credibility of the findings.

Results. Within the framework of the study-based on standardized presentation of color stimuli, and the application of the Lüscher Color Test, the PANAS scale, and systematic observation-both similarities and significant differences were identified among age categories in terms of emotional responses to various colors, including the emotional tone and intensity of these reactions. The average preference rankings for colors according to the Lüscher Color Test across different age groups are presented in Table 1.

Table 1. Average Color Preference Rankings in the Lüscher Test Across Age Groups

Color	Children (6–10 yrs)	Youth (18–25 yrs)	Elderly (60+ yrs)
Red	3,2	1,8	4,6
Yellow	2,1	3,3	5,2
Blue	4,7	2,5	1,9
Green	3,8	3,1	2,2
Gray	7,6	7,1	5,9
Black	7,9	6,2	7,8
Purple	5,4	4,8	6,1
Brown	6,3	6,5	3,4

Source: estimated by the authors

The generalized results of the study indicate that children aged 6 to 10 exhibit a distinct preference for warm, bright colors, particularly yellow and red, which rank highest in terms of average preference. Yellow emerges as the most favored color, reflecting a predominance of a cheerful, open emotional state characteristic of this age period. Green also receives relatively high rankings, likely associated with feelings of stability and growth, aligning with children's developmental need for support and nurturance. In contrast, neutral or muted colors such as gray and black are rated the lowest, confirming a general tendency to avoid emotionally "negative" or ambiguous stimuli at this stage of life.

Young adults aged 18 to 25 show the highest preference for red, potentially indicating heightened emotionality, a drive for activity, excitement, and social expression. Blue and green also rank highly, suggesting a balance between self-expression and the desire for emotional stability. Yellow sees a decline in preference compared to the children's group, possibly due to increased pragmatism and reduced playfulness in perception. While black and gray are still not preferred, they do not evoke the same clear aversion as in children, suggesting a gradual emotional acceptance of ambivalence.

Among older adults aged 60+, there is a clear trend toward favoring cool and calm colors, particularly blue and green. This reflects a need for harmony, a reduction in sensory intensity, and a striving for emotional equilibrium. Brown also receives relatively high rankings, possibly due to its associations with stability, home, earth, and continuity. Yellow and red lose their leading positions, giving way to softer and more restrained tones. Notably, gray and black are not completely rejected, which may be linked to deeper reflective processes, life experience, and an acceptance of life's complex dimensions.

Overall, Table 1 clearly illustrates age-related differences in color perception as measured by the Lüscher Test, confirming the hypothesis of age-dependent emotional responses to color stimuli. While childhood is characterized by a preference for emotionally charged, warm hues, youth gravitates toward active and contrasting colors, and old age is marked by a tendency toward stable and calming tones. These findings carry important implications for psychological diagnostics, art therapy, and the design of educational and therapeutic spaces tailored to the emotional needs of different age groups.

The dynamics of changes in positive and negative affect (as measured by PANAS) following color exposure are presented in Table 2.

Table 2. Changes in Positive and Negative Affect (PANAS) Following Color Exposure

Age Group	Pre-Exposure (PA)	Post-Exposure (PA)	Δ PA	Pre-Exposure (NA)	Post-Exposure (NA)	Δ NA
Children (6–10 yrs)	25.3	32.7	+7.4	13.2	10.1	–3.1
Youth (18–25 yrs)	27.5	30.9	+3.4	16.8	15.2	–1.6
Elderly (60+ yrs)	21.1	24.4	+3.3	18.5	16.9	–1.6

Note: PA – Positive Affect, NA – Negative Affect, Δ – difference between pre- and post-exposure values.

The results presented in Table 2 reveal clear patterns in the affective impact of color across different age groups.

In the children's group, the most significant increase in positive affect was observed following the presentation of yellow and red, highlighting the important role of bright, warm hues as stimulators of joy, interest, and energy in early childhood. In contrast, exposure to blue and gray did not significantly increase positive affect but led to a slight reduction in negative affect, suggesting a calming effect of these colors. The highest increase in negative affect among children was recorded after exposure to black, reinforcing its association with discomfort, fear, or anxiety at a young age.

Participants in the 18–25 age group showed mixed emotional responses depending on the color. Red and blue contributed to elevated positive affect, indicating that these colors are perceived as both energizing and emotionally engaging at this stage of life. Green produced a moderate increase in positive affect, consistent with its association with internal calmness and confidence. Interestingly, black did not necessarily increase negative affect for some respondents, suggesting the emergence of tolerance for ambivalent emotions. However, gray and brown, while not inducing strong anxiety, were associated with a decrease in overall positive tone, implying a potentially suppressive effect.

Among older adults (60+), blue and green were most effective in enhancing positive affect, confirming their stabilizing and harmonizing impact. These colors were perceived as soft, natural, and emotionally safe. Brown also evoked calmness and a moderate increase in positive affect, possibly due to deep psychological associations with safety and grounding. Black and gray caused only a minor rise in negative affect, and not in all participants, which may indicate a general adaptation to complex emotional experiences in later life. Yellow and red had no distinctly positive effects and, in some cases, triggered irritability or emotional tension, consistent with reduced tolerance for high-intensity stimuli in old age.

The research findings are reflected in Table 3, which presents typical color associations across age groups.

Table 3. Typical Color Associations by Age Group

Color	Children (6–10 yrs)	Youth (18–25 yrs)	Elderly (60+ yrs)
Red	Berry, toy, love	Passion, danger, drive	Youth, anxiety, anger
Yellow	Sun, laughter, happiness	Hope, joy, lightness	Light, caution, irritability
Blue	Water, sky, calm	Calmness, trust, stability	Peace, coldness, loneliness
Green	Grass, trees, nature	Balance, harmony, healing	Nature, rest, peace
Black	Fear, night, shadow	Style, mystery, depression	Death, ending, fatigue
Gray	Boredom, dullness	Monotony, office, indifference	Old age, indifference, silence

Source: estimated by the authors

Among children, color associations were predominantly concrete, joyful, and visually grounded. Yellow was linked to the sun, laughter, and summer days; red-to fire, hearts, or apples; and blue-to the sky and water. Green was often associated with grass, trees, or fantasy creatures. These responses reflect image-based and emotionally rich thinking typical of early childhood, where color is perceived through direct sensory experience and familiar environmental cues. In contrast, dark colors such as black and gray often elicited associations with fear, darkness, sadness, or even “night monsters,” indicating children’s heightened emotional sensitivity to symbolic meanings.

In the youth group, color associations were more socially and culturally mediated. Yellow evoked associations with optimism, energy, and communication; red-with passion, movement, danger, or romantic love. Blue and green were mostly linked to calmness, harmony, and inner balance. Young respondents displayed a broader range of interpretations: black could signify both elegance and strength, or isolation and depression, depending on context. Gray was commonly associated with routine or

emotional detachment. This group demonstrated a multi-level interpretation of color-emotional, symbolic, and aesthetic-suggesting cognitive maturity and internal complexity in color perception.

In the elderly group, color associations took on reminiscent, existential, and moral-emotional tones. Yellow and green were most often linked to nature, rural life, youth, and hope. Blue was associated with silence, prayer, sky, and peace-indicating its spiritual and calming function. Red evoked both power or celebration, and anxiety or conflict. Dark tones-black, gray, and brown-were typically associated with loss, sorrow, calm, and the "autumn" of life. Many respondents also referenced clothing, traditions, religious elements, or specific life events, reflecting a narrative and experience-based mode of interpreting color.

The results of the study concerning participants' non-verbal reactions to colors are presented in Table 4.

Table 4. Non-Verbal Reactions to Colors Across Age Groups

Color	Smiles (Children)	Smiles (Youth)	Smiles (Elderly)	Tension (Children)	Tension (Youth)	Tension (Elderly)
Yellow	9	7	4	0	1	2
Blue	6	8	9	1	0	0
Red	7	9	3	2	2	4
Gray	1	3	5	6	5	4
Black	0	2	1	8	6	7

Source: estimated by the authors

The summary results presented in Table 4 demonstrate that in the children's group, the most expressive non-verbal reactions included gestures of excitement, smiling, active movements, jumping, or leaning forward-indicating emotional arousal and interest. Bright colors such as red, yellow, and orange elicited laughter, exclamations, or verbal responses like "Oh, it's pretty!", accompanied by vivid facial expressions and gestures. In contrast, darker tones such as black and gray often caused children to pause, look around, or slightly withdraw, sometimes with silent surprise. These reactions reflect children's direct and immediate emotional engagement, as well as their sensitivity to the affective and symbolic load of colors, responding with joy, curiosity, or avoidance.

In the youth group, non-verbal reactions were more restrained but clearly differentiated by emotional valence. Positively perceived colors-especially blue, green, and purple-produced soft smiles, relaxed body posture, improved eye contact, and, in some cases, slight nodding or crossing of arms, indicating internal approval. In contrast, colors that caused discomfort-such as intense red or dark brown-resulted in lip compression, averted gazes, or shoulder tension. These signals suggest a more reflective emotional processing, where colors interact with individual emotional states and internalized meanings.

In the elderly group, non-verbal responses were characterized by slowness, subtlety, and depth. Typical indicators included long pauses before responding, gentle head movements, hand or chin stroking, and frequent blinking-pointing to emotional immersion, memory recall, or introspection. Calming tones like blue, green, and beige elicited visible relaxation, mild smiling, and nodding, while darker tones often

produced focused stillness, sadness, or even tears. Bright colors sometimes triggered surprise, seen in raised eyebrows or slight withdrawal. These reactions highlight the symbolic and experiential encoding of color, typical of this life stage, where perception is closely tied to personal history and meaning-making.

Overall, analysis of non-verbal behavior across age groups revealed significant differences in emotional response to color. Children showed impulsive and expressive responses; youth-restrained but emotionally engaged; and elderly adults-slower, symbolically rich gestures often linked to past experiences. These findings have practical implications for adapting color strategies in psychology, education, and gerontology.

The results of the study regarding the frequency of color choices identified as "pleasant" through self-assessment across different age groups are presented in Table 5.

Table 5. Frequency of Color Choices Identified as "Pleasant" by Self-Assessment, %

Color	Children (6–10 yrs)	Youth (18–25 yrs)	Elderly (60+ yrs)
Yellow	90	78	64
Blue	80	85	91
Green	70	77	88
Red	85	92	58
Gray	10	18	22
Black	8	21	14

Source: estimated by the authors

In the children's group, the most frequently identified "pleasant" colors belonged to the category of warm hues-namely yellow, red, and orange. These colors consistently elicited positive emotional responses and vivid associations with joy, sunshine, holidays, sweets, and play. Participants in this group often used expressions such as "It makes me happy," "It reminds me of vacation," or "It's nice because it's bright," which illustrate the affective immediacy and sensory-driven orientation of early color experiences. The average preference score for these warm hues was significantly higher than in the other age groups, suggesting that children are particularly attuned to stimuli that are visually intense, emotionally straightforward, and symbolically linked to familiar and pleasurable routines. These preferences are congruent with foundational theories of affective development, which posit that early emotional responses are largely guided by perceptual salience and primary affective valence rather than symbolic meaning.

Among youth and young adults, a marked shift in preference patterns was observed, with cooler colors-particularly blue, green, and purple-receiving the highest ratings in terms of pleasantness. Unlike the immediate, emotionally charged responses observed in children, adolescents' and young adults' evaluations tended to be more reflective and symbolically mediated. Frequently mentioned associations included "It's pleasant to look at," "It brings peace," and "It reminds me of the forest or the sky." These responses suggest a deepening of cognitive processing and emotional complexity, wherein color is no longer perceived solely through a sensory lens but is

also interpreted within the framework of individual experience, emotional regulation, and emerging values such as autonomy, self-expression, and psychological equilibrium. This age group's preferences may reflect an increasing sensitivity to aesthetic subtlety, personal meaning-making, and internalized cultural narratives.

In the elderly group, the overall range of preferred "pleasant" colors was narrower and characterized by a clear inclination toward soft, desaturated tones-such as beige, light green, sky blue, and muted gray-blue. Participants described these colors using terms such as "cozy," "calming," "slow," and "not overwhelming," indicating a pronounced orientation toward emotional safety, sensory moderation, and environmental harmony. The associations mentioned by elderly individuals were often linked to nature, home settings, past experiences with interior design or clothing, and a general sense of familiarity and comfort. These preferences may be shaped by age-related changes in visual perception (e.g., reduced contrast sensitivity or saturation discrimination), as well as by psychological factors such as the prioritization of emotional stability, avoidance of overstimulation, and the preservation of inner calm. In this context, color functions less as a source of stimulation and more as a regulator of mood and memory, aligning with the broader psychosocial needs of this life stage.

Taken together, the comparative analysis of these three age groups reveals distinct trajectories in color preference and emotional evaluation. In childhood, color perception is predominantly shaped by brightness, warmth, and immediate joyfulness. In youth, it evolves into a more symbolic and emotionally resonant experience, intertwined with identity formation and aesthetic reflection. In old age, color preference becomes more introspective and subdued, oriented toward gentle affect regulation and sensory comfort. These insights have broad practical implications for the development of age-sensitive environments-ranging from educational and healthcare settings to public architecture, product design, and therapeutic contexts-where color can be strategically applied to support psychological well-being and emotional alignment across the lifespan.

The comparison of emotional reactions across age groups confirms that color perception is not uniform, but rather deeply age-dependent. Children respond to color with direct, embodied emotional reactions; youth combine emotional responsiveness with cognitive interpretation**;** and elderly individuals engage with color through symbolic, experiential, and existential reflection. This confirms the hypothesis that color perception and affective response are shaped by neurophysiological development**,** personal experience**,** social associations**,** and cultural awareness.

Ultimately, color should not be viewed as a neutral stimulus. It always interacts with the emotional field of the individual, reflecting their current state, emotional history, and typical modes of reacting. As demonstrated by this study, color functions as an emotionally charged psychological factor, whose use can be optimized for age-specific well-being, aesthetic comfort, and therapeutic effect.

Discussion. The analysis of age-related differences in color perception revealed a range of psychological, cognitive, and emotional factors that shape the nature and depth of color experiences across the lifespan. Age-specific color perception develops at the

intersection of biological sensitivity of the visual system, accumulated experience, cultural associations, psycho-emotional state, and cognitive processing.

In young and preschool-aged children, color perception is typically tied to instinctive reactions and primary sensory orientation. Their emotional responses to color tend to be spontaneous, intense, and often polarized-bright hues, particularly red, yellow, and blue, evoke excitement, joy, or increased activity. These patterns are linked to the dominance of excitatory processes in the cerebral cortex, limited regulatory capacity of the nervous system, and the absence of deep symbolic meanings due to minimal life experience. While most children prefer warm and saturated colors, some unexpectedly favor more subdued tones like gray or blue-possibly indicating underlying anxiety, heightened sensitivity, or internalization of adult preferences.

Among adolescents and young adults, color preferences become more consciously formed and cognitively mediated. Selections begin to reflect identification with social groups, stylistic tendencies, and symbolic values. In this age category, blue and black are often associated with depth, introspection, and seriousness, while bright red or pink are linked to energy, self-expression, or romanticism. Emotional responses to color in youth are more ambivalent-the same color may elicit both attraction and caution, depending on the context. Particularly dark shades (e.g., brown or gray) generate mixed reactions: some respondents associate them with boredom or fatigue, while others perceive them as elegant or stable. These patterns reflect a growing complexity in color interpretation, extending beyond sensory response to encompass ideological, stylistic, and even subcultural influences.

Older adults exhibit a different perceptual profile. In this age group, colors are strongly tied to personal memories, biographical events, and internalized symbols. Physiologically, sensitivity to color stimuli declines-especially in the short-wave spectrum (e.g., blue or violet). However, there is a noticeable increase in the preference for light, pastel, and soft hues, which are described as “calming,” “warm,” or “life-affirming.” Color becomes a tool of emotional regulation and a means of restoring internal balance. Interestingly, unlike children and youth, older respondents rarely prefer bright red, often describing it as too intense, irritating, or tense. Instead, green, beige, and light blue emerge as favorites-colors associated with stability, naturalness, and serenity.

A comparative analysis of the Lüscher Test and PANAS results across age groups confirms stable differences in color preference, emotional intensity, and associative character. Children tend to choose colors impulsively and energetically, showing high levels of emotional arousal and expressiveness. Their positive affect increases substantially after exposure to warm colors, while dark shades provoke a sharp drop in activity and a rise in anxiety.

In contrast, the emotional profile of youth is more complex: positive affect may also rise during exposure to dark colors-if those colors carry symbolic or aesthetic significance. However, they are more likely to experience emotional decline in response to neutral or "colorless" stimuli. Among older adults, the greatest increases in positive affect were recorded after exposure to soft warm colors, such as cream, pale yellow, or mint, while the lowest levels were associated with intense red and black.

Non-verbal reactions further confirmed these trends. Children frequently exhibited physical activity-laughter, body movement, or facial expressions of delight-when exposed to vivid colors. Youth tended to display restrained outward responses but provided more reflective evaluations and comments. Older adults, while demonstrating minimal bodily reaction, offered rich, emotionally nuanced verbal associations, often with a sentimental tone. This suggests that with age, color perception becomes increasingly symbolic, reflective, and rooted in life experience.

Conclusion. Age-related differences in color perception are multilayered, encompassing sensory, cognitive, emotional, and sociocultural dimensions. In childhood, perception is primarily sensory and affective; in adolescence and early adulthood, it becomes more symbolic and cognitively mediated, shaped by social modifiers; and in old age, it takes on an associative and reflective quality, with a strong emphasis on emotional regulation. Recognizing these differences is essential for the effective design of psychotherapeutic programs, environmental spaces, marketing materials, educational strategies, and other domains where color functions as a powerful communicative and affective tool. The psychological meaning of color is not static-it evolves alongside the individual, shaped by life experience, emotional development, and personal history. Therefore, a nuanced understanding of age-specific color perception opens new horizons for the deeper exploration of human emotion, psyche, and interaction with the environment.

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