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The Psychology of Colors

The Effect of Colors in Advertising

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Abstract: The article examines how colors in the advertising world affect people. Colors have a greater influence on our **lives** than often assumed, as they not only shape our environment but also influence our emotions. Colors trigger reactions in people and are capable of—albeit subconsciously—manipulating their decisions. In today’s fast-paced world, first impressions have become crucial, and they carry great importance for every brand, since visual stimuli receive only about five seconds of attention. During this brief time, interest must be captured and the message successfully conveyed. Well-designed advertisements produce an automatic effect, which is especially important in our current world where consumers have grown accustomed to ads and are less likely to trust rational messages. Therefore, the conscious use of colors in marketing and in everyday life is a vital tool for guiding emotions and behavior, yet there is insufficient information about their effects and even less about the **results**. This research sheds light on how colors should be used based on their meanings, and which specific colors produce certain outcomes for example, yellow proved to be the most effective for attracting attention, while white turned out to be the most suitable for prompting action. For this, data from a Meta advertisement was examined, and answers were gathered through a questionnaire. The results also reveal that preferences for colors and attitudes toward them differ by age group, and that two tonal colors black and white are considered metaphors for luxury.

Keywords: advertising psychology; color psychology; consumer behavior; customer decision-making; social media campaign

JEL classification: M31; M37; M39

1. Introduction

The five basic senses are fundamental to our everyday lives – it would be impossible to imagine life without them. Smell, sight, taste, touch and hearing all exist to help us live fully, protect us, allow us to enjoy experiences or even teach us lessons. Of these, sight – particularly the perception of color – is of immeasurable importance. The significance of color can be traced back to ancient times, as even people and animals living before our era relied heavily on color for obtaining and judging food. Often, the color of plants indicated and helped them remember which foods provided valuable nutrients and which were harmful or even poisonous. Not only humans but also animals, even to this day, make decisions based on colors and their shades when it comes to essential elements and factors in their daily lives. For example, when they gathered and consumed poisonous berries and subsequently became ill, they associated the negative outcome with the color and learned that a certain red berry “was not good” because it made them sick. Living beings – whether humans or animals – experience, learn, associate and then recall and apply that knowledge to their advantage. Judging based on color has always been instinctive for living beings as part of survival, just as it remains so today.

However, colors are not merely visual tools; their significance goes far beyond food gathering and survival. The human brain reacts differently to different colors. Colors influence our emotions, decisions and even our purchasing habits, as each color evokes different feelings and associations. These may vary depending

on culture, personal experience and many other factors, but there are general guidelines, such as nation-specific color-emotion associations. The dominance and significance of colors have not diminished over time; every human being and even animals attach emotions, judgements and thoughts to certain colors. This topic could not be more relevant in an age where we encounter countless advertisements and stimuli – both online and offline – every single day. No company would want to be associated with the meaning of that metaphorical poisonous “red berry”.

The four primary colors – red, blue, green and yellow – together with black and white, dominate our lives, as any new shade can be created from these combinations. The article focuses on these hues and explores what kinds of stimuli and emotions each color elicits in people today, and the reasons behind these reactions. It examines how color-emotion pairings can be used effectively and asks: how can certain advertisements, companies and their objectives stand out from the noise of marketing in Hungarian culture using only colors? What emotions and thoughts are triggered by different color variations or dominant shades? This article is not merely about colors or their effect on people, but about deciphering and utilizing the process. The topic is researched with a complex approach, examining it from multiple perspectives. To answer these questions, the article applies a quantitative research method, including questionnaires and color use in advertisements, to interpret results from primary research. The secondary research is based on scientific articles and previously published experiments.

2. Historical overview

2.1. What are colors

The definition of color begins with light for everyone; however, it is a multi-component process, and its perception can originate from different points. In the science of color theory, color is defined as a spectral experience perceived by a person with normal color vision from the light received by the eyes. Color is the result of a complex process in which the physical properties of light, the physiological function of the eye, and the psychological activity of the brain all play a role (Wenzel, 2013). Research into this topic began even before our era and has continued ever since. It is fascinating to trace the development of the study of colors, which has been approached not only from a philosophical and artistic perspective but also from a mathematical one.

2.2. Before Our Era

In the 5th century BC, Empedocles believed that vision worked by the eye directly “taking in” the objects it perceived. He recognized only two colors: black and white, representing fire and water (Nagy, 2009). In the 4th century BC, Aristotle attempted to systematize the philosophical approach to color scientifically in his work *On Colours* (*De Coloribus*), in which he defined four basic colors corresponding to the four classical elements. His approach, however, was entirely philosophical, deriving colors from mixtures of light and darkness created by the Sun (Barnes, 1984).

2.3. 15th–18th Centuries

Leonardo da Vinci (1452-1519) examined colors from both artistic and scientific perspectives, summarizing his research in his book *Trattato della pittura*. This work detailed the expansion from four basic colors to eight elements (MTA Könyvtár és Információs Központ, 1995). At the turn of the 17th and 18th centuries, Isaac Newton's glass prism experiments showed that white light, when passed through a prism, split into the colors of the rainbow, and could then be recombined to produce white light again. Newton also added magenta to the rainbow colors (Wenzel, 2013). Jacob Christoph Le Blon (1725) used three primary colors

(red, blue, yellow) in his color-mixing theory, which became significant in art and printing (Le Blon, 1725). Tobias Mayer (1723-1762) later systematized the three primaries and their combinations mathematically (Wenzel, 2013).

2.4. Late 18th–19th Century

Johann Wolfgang von Goethe (1749-1832) was primarily interested in the psychological and physiological properties of colors. In his book *Theory of Colours* (*Zur Farbenlehre*), he emphasized subjective perception, noting the cooperation between the brain and the eye, and focused on experiential observation. Goethe divided colors into three groups: primitive (basic perception), complementary (psychological effects), and symbolic (symbolic meanings) (Goethe, 1810; Wenzel, 2013). Helmholtz and the British scientist Young further developed the trichromatic theory, explaining color perception by the combination of three receptors in the retina (red, green, blue) (Turner, 1994).

2.5. 20th Century - Today

Research on colors shifted towards the development of color systems. Munsell (1905) described colors in three dimensions: hue, lightness and saturation (Munsell, 1905). The CIE color system mathematically defined colors along the X, Y and Z axes (CIE, 1932). The RGB additive system uses the combination of red, green and blue light for digital displays, while CMYK is based on subtractive mixing (Perge, 2007; Színkommunikáció, 2010). In the 21st century, color research has become multidisciplinary, incorporating neuroscience, technology and marketing. In brand communication, colors not only help a brand stand out in the market but also play a crucial role in consumer decision-making. These decisions are said to be determined 90% by visual factors, of which 85% are based on the color of the product (Pszichozóna, 2015; Dér & Szente, 2021; HubSpot, 2023).

3. Color Psychology

Color psychology is an important field of study that examines the effects of color on human emotions, behavior and thought processes. Numerous studies suggest that people associate certain emotions more strongly with specific colors than with others, and colors can also influence mood. While associations can vary according to culture, personal experience, circumstances and other factors, there are widely recognized emotion-color pairs that can be applied effectively (Perge, 2007; Színkommunikáció, 2010).

3.1. Blue

Blue conveys calmness, trust and stability. It lowers heart rate and has a soothing effect, which is why brands seeking to communicate reliability often use it (Sas, 2018). It is a favored shade in the technology and financial sectors (e.g. Intel, PayPal). Globally, blue is perceived positively, although shades may vary in effect by culture. Darker tones can also be associated with melancholy (Maksat & Pakizar, 2024). Goethe described blue as special, suggesting distance yet offering tranquility (Goethe, 1810).

3.2. Red

Red evokes intense emotions: passion, energy and danger. Cultural interpretations vary – it can represent love or mourning. Biologically, it increases alertness, making it ideal for urgency. Frequently used in sale and discount messages (Sas, 2018). Its brightness can stimulate appetite (e.g. McDonald's, Coca-Cola). Deeper

tones (e.g. burgundy) convey luxury and sophistication. However, excessive use can induce stress (Walter & Novák, 1977).

3.3. Yellow

Yellow is associated with joy, energy and creativity. It is particularly effective among children and young audiences. Like red, it attracts attention but excessive use can cause unease (Walter & Novák, 1977). Its meaning varies by culture – envy in some, sadness in others. In logos, it conveys cheerfulness, dynamism and agility. Although Ferrari is known for its signature “Ferrari red”, its logo is yellow, precisely for the reasons mentioned above (Fairyworkshop, 2021; Dér & Szente, 2021).

3.4. Black

Black suggests elegance, strength and formality. While culturally associated with mourning, it is often chosen by luxury brands (e.g. Gucci, Apple). Overuse can be oppressive, but it conveys seriousness, modernity and respect (Dér & Szente, 2021). To avoid cheapening a luxury product, brands often replace bright colours with more subdued tones such as pastels, black or white (Bytyçi, 2020). Henry Ford also chose black for his iconic Model T (Formula, 2018).

3.5. White

White symbolizes purity, innocence and simplicity. It is widely used in technology and healthcare (Dér & Szente, 2021). Its significance varies culturally – positive in the West, associated with mourning in parts of Asia. It is often used as a background to highlight content but rarely stands alone. Excessive use can create a sense of sterility (Matykó, 2024). In healthcare and medical branding, it represents hygiene – seen in brands such as Dove and Colgate, where white dominates both packaging and logos, conveying cleanliness and care (Sainte-Anastasia.org, 2025).

3.6. Green

A color closely linked to nature, green has a calming effect and stimulates creativity. It is popular among eco-friendly and organic products. Light green suggests freshness, while dark green conveys security (Dér & Szente, 2021; Matykó, 2024). Research shows it improves concentration and reduces errors (Walter & Novák, 1977). The human eye can distinguish many shades of green, aiding survival in nature – a fact utilized in advertising, where various green tones can be used even within a single logo, such as BP. Green is not just a simple color but a complex psychological and aesthetic phenomenon that plays a major role in everyday life (Sas, 2018).

3.7. Combining Colours

The emotional effect of color combinations is also significant. Blue and white together are calming and encourage communication, making them a perfect match for social media (e.g. Facebook), while red and grey are attention-grabbing (Maksat & Pakizar, 2024; Bytyçi, 2020). Yellow and black create a strong contrast, often used as a warning. Yellow attracts attention while black signals seriousness – together they bring out each other's value. Many brands use this combination to convey both quality and visibility, such as Ferrari, Nikon and CAT. The contrast between yellow and blue is also striking, drawing attention while appearing fresh and harmonious, as seen in the IKEA logo (Goethe, 1810; Walter & Novák, 1977). The

red-white-yellow trio evokes strong emotions (e.g. McDonald's, Coca-Cola). Black paired with other colors (e.g. gold) enhances the sense of luxury (Goethe, 1810; Sas, 2018).

4. Offline and Online Visual Marketing

Colors have an impact on brain activity and human behavior (Agárdi, 2010). Not only colors but every visual element – such as shapes, fonts and faces – influences our decisions. The primary aim of marketing is to attract attention, and colors play a key role in this. First impressions are formed within seconds, so the use of color can be decisive. In Porsche's case, for example, the red shade became so distinctive that it became known as "Porsche red" (Gollety & Guichard, 2011).

4.1. Online Advertising

The first online banner appeared in 1994, created by AT&T. It was a colored banner bearing the message: "Have you ever clicked your mouse right here? You will." Its huge success marked the beginning of the online advertising industry (Chaffey & Bosomworth, 2013).

In the online space, colors evoke emotional reactions: for example, red tends to increase click-through rates. Platforms such as Facebook and Google make it possible to send targeted impulses to users through colour choices, eliciting emotional responses to adverts (Sas, 2018). Visual ads – images, videos, GIFs – capture attention quickly. The type of content (e.g. brand awareness versus driving website visits) determines the most suitable format (Félegyházi, 2024).

One famous example is the "Million Dollar Homepage", which sold advertising space pixel by pixel and achieved enormous success in a short time (Sterne, 2024). Online advertising can be personalized, measured quickly and adapted more easily to market changes than offline solutions (Skender, Lionel & Tuan, 2011). The Meta system enables highly detailed targeting based on factors such as gender, age, interests and location.

4.2. Offline Marketing

Although it has become less dominant, offline marketing – TV, radio, print, outdoor advertising – remains important. It is an integral part of marketing communication and an essential component of the marketing mix. It reaches a wide audience but is less targeted. Television adverts engage both visually and audibly, printed media offer demographic targeting, and billboards are primarily used for brand building. Its advantage lies in offering a tangible, personal experience – seeing and touching a product – something not possible online (Skender, Lionel & Tuan, 2011).

5. Research Methods

Two research methods were applied. The first was a questionnaire, which initially contained simpler cognitive questions, followed by emotion-based questions. It also presented colored images and advertisements to measure the respondents' subconscious perceptions and emotional reactions. The questionnaire was distributed among Hungarian citizens, and over a two-week period, responses from exactly 150 participants were collected, all of which were usable. The second method was practical: six Meta advertisements corresponding to the six colors under investigation were run in a four-day campaign. The ads were shown in Budapest (coordinates 47.4815, 19.2112 with a 15 km radius) and targeted exclusively at women. The target group was not limited to a single generation but included four age groups (X, Y, Z, Baby Boomers). The aim was to determine which colors attract the most attention in Hungarian culture, how they help break through advertising noise, and which shades most effectively encourage action, such as clicking.

The goal of the research was to identify which colors most strongly influence consumer reactions and how this can be utilized in marketing.

5.1. Meta Advertisement

In the first study, Meta advertisements by an aesthetics company were analysed over a specific period. The company is located in central Budapest and was founded in 2019. It is active on social media platforms including Facebook, Instagram and TikTok. The clinic receives an average of approximately 300 visitors per week and offers aesthetic treatments; accordingly, the advertisements used in the research focus on anti-wrinkle treatments. Comparing the effectiveness of the ads is a complex task, as numerous influencing factors exist, such as ad optimisation and the automated distribution of the budget within the campaign. The creative content of the analysed ads was produced with the dominant color being one of the six primary colors (red, blue, yellow, green, black, white), with all other aspects – content and structure – remaining identical. The company’s primary target audience is middle-aged women living in Budapest who care about their appearance and wish to rejuvenate or improve their looks. Accordingly, the demographic settings were adjusted to target women aged 25–64 (since the services are primarily aimed at women), within a 15 km radius of a central Budapest point, covering almost all of Pest. The advertisements were displayed on Facebook and Instagram between 6th and 9th January 2025. Within the campaign, the content was launched as two separate ad sets: one remarketing set targeting those who had visited the website, the company’s social media profiles, or the clinic in person, or who had subscribed to the newsletter; and one “cold” audience set aimed at attracting new patients. Apart from these segments, all other demographic and content settings remained unchanged. Since the ads ran simultaneously, the budget was distributed across the 12 creative pieces, automatically adjusting based on the performance of each ad. Taking these factors into account, the results for the same color were combined in the subsequent calculations. The campaign objective was “interested users”, specifically showing the ads to people already inclined towards the topic.

5.1.1. CPC

Table 1. Results and data of advertisements (self-edited, 2025)

Coulor	Expenditure (HUF)	Cost per Click (CPC)	Displays	Click-through rate (CTR)	Clicks	Reach of the 25–34 age group	Reach of the 35–44 age group	Reach of the 45–54 age group	Reach of the 55–64 age group
#000000	27 603	152,50 Ft	11806	1,53%	181	1058	1827	3266	1030
#ffff00	10 195	175,78 Ft	4163	1,39%	58	551	857	1264	402
#ffffff	9 177	148,02 Ft	3733	1,66%	62	569	739	1054	298
#ff0300	5 236	154,00 Ft	2555	1,33%	34	261	388	861	324
#72f130	4 646	178,69 Ft	2116	1,23%	26	200	353	670	259
#0317ff	3 143	314,30 Ft	1421	0,70%	10	116	239	496	189

As can be seen from the table, the daily budget for the six colors was HUF 15,000, which Meta distributed as shown. It is noticeable that due to the high interest in the black advertisement, the system allocated the largest portion of the budget to it, while the blue ad received the smallest allocation over the four days. Averaging the amount spent against the number of clicks – indicating user activity – reveals variations in the ads’ effectiveness. Based on CPC (Cost per Click) results, the black ad, despite its high interest and expenditure, ranked as the second most successful campaign in terms of clicks per cost. The white ad achieved the most activity relative to the smallest spend, making it the top performer in this regard. The red creative ranked third in terms of CPC; its cost was almost one-quarter of the black ad, yet relative to the number of clicks, it performed well. The blue ad was the least efficient in terms of CPC, with some clicks costing over HUF 300. Interestingly, the yellow ad, despite being the second most frequently displayed and generating the third-highest number of clicks, underperformed when considering CPC.

5.1.2. CTR

Moving to the CTR (click-through rate) column, which compares impressions to clicks, the white ad again delivered the highest benefit, with 1.66% of people who saw the ad clicking on it. The success ranking was largely similar to the CPC ranking; however, the positions of the yellow and red ads were reversed. While red ranked third in CPC analysis, yellow took third place based on CTR. Consequently, red dropped back, with only 1.33% of viewers engaging with the ad. As expected, blue and green content achieved lower success in this measure. Although their costs did not even reach HUF 5,000, both ads performed poorly relative to clicks, impressions, and cost-effectiveness.

5.1.3. Conclusion

From these data, it can be concluded that the white campaign achieved the best results, both in terms of CPC and CTR, followed by black. The lowest performers were the blue and green creatives, which underperformed in all aspects. While yellow and red attracted attention, they were less effective in motivating user engagement. CPC and CTR ratios usually produce similar outcomes; however, as seen here, this is not always the case (e.g., yellow and red). Therefore, it is essential to clearly define the goal and base the creation and configuration of ad creatives on it.

5.1.4. Age Groups

The second half of the table shows the reach by age group. The campaign targeted individuals aged 25–64, as anti-wrinkle treatments are typically started at a younger age and continue to be used by older adults. The age range was divided into four groups: 25–34 and 35–44 (Z and Y generations), and 45–54 and 55–64 (X and Baby Boomer generations) due to similar results, the two pairs of age groups should be treated together as younger and older age categories.

It is important to note the difference between impressions and reach. Impressions indicate the total number of times the ad was displayed (which may include multiple views by the same person), whereas reach indicates the number of unique users who saw the ad (counted once per person). From the table, it is clear that the 35–44 and 45–54 age groups were reached most frequently by all ads.

Table 2. Reach of ads by age group (self-edited, 2025)

Color	Total reach	Percentage (25–34/total)	Reach of the 25–34 age group	Percentage (35–44/total)	Reach of the 35–44 age group	Percentage (45–54/total)	Reach of the 45–54 age group	Percentage (55–64/total)	Reach of the 55–64 age group
#000000	7181	14.73%	1058	25.44%	1827	45.48%	3266	14.34%	1030
#ffff00	3074	17.92%	551	27.88%	857	41.12%	1264	13.08%	402
#####	2660	21.39%	569	27.78%	739	39.62%	1054	11.20%	298
#ff0300	1834	14.23%	261	21.16%	388	46.95%	861	17.67%	324
#72f130	1482	13.50%	200	23.82%	353	45.21%	670	17.48%	259
#03f7ff	1040	11.15%	116	22.98%	239	47.69%	496	18.17%	189

Analyzing the age-group data in the table using percentage averages, it becomes possible to determine which color creative reached each age group most effectively. Meta’s database filters and adjusts ads according to user experiences. In the table, the highlighted red cells indicate the color with the highest reach within each age group. For the 25–34 age group, the white creative – which also achieved the best overall reach – was the most effective. For the 35–44 age group, yellow performed best, while surprisingly, for the 45–54 and 55–64 groups, blue – which performed lowest overall – was the most preferred ad. Interestingly, despite receiving significant attention, black did not achieve the highest reach in any age group; nevertheless, overall, it still acted as a strong motivator. Based on literature findings, the research delivered the expected results. Since the study relates to an aesthetic clinic, people associate it with qualities such as simplicity, elegance, quality, professionalism, and beauty. The two “winning” colors according to CPC and CTR precisely evoke these emotions, thereby confirming the solid foundation of the secondary research.

5.2. Questionnaire Research

The next research method involved questionnaires, examining the topic from multiple perspectives. A total of 150 participants from different generations completed the survey. The study explored colour associations, attention-grabbing potential, elicited emotions, and pairings, comparing results across generations. Responses were received from 34 individuals in Generation X, 20 in Generation Y, 92 in Generation Z, and four from the Baby Boomer generation. The first question investigated how much the product's appearance influences consumers' decisions. Respondents rated their opinions on a scale from 0 to 4. The majority indicated that product presentation matters, giving an average score of 3.6. Similar scores were observed across all generations. Based on this, the next question asked whether there had been occasions where the product's appearance alone convinced them to purchase. Eighty per cent responded affirmatively. Of the 150 respondents, 129 indicated that they most often gather product information via online advertisements. These results provide a solid basis for the research, demonstrating that the majority of people are aware that product appearance strongly influences them. Furthermore, 27 respondents specifically confirmed that they encounter products and advertisements most frequently online.

5.2.1. Color Associations

The second part of the questionnaire focused in more detail on colors and their associated emotions and associations. The first question asked respondents to match the six colors under investigation with eight descriptive terms (three negative and five positive). From this data, it is possible to examine the attitudes people hold towards each color.

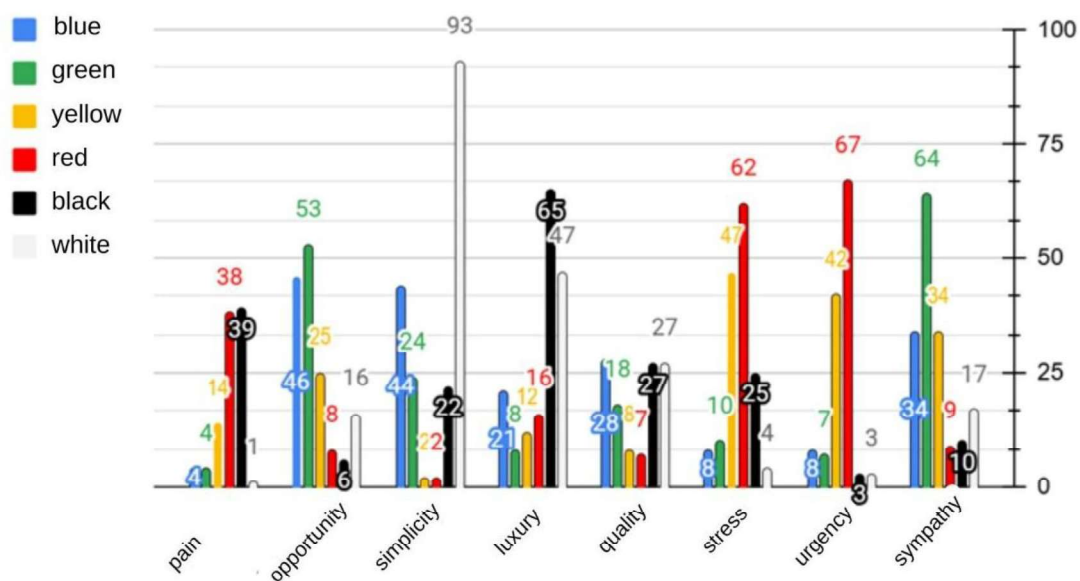


Fig. 1. Results of color-expression pairing (self-designed, 2025)

As the figure shows, blue was most commonly associated with the concept of opportunity; however, most respondents linked this term to green rather than blue. For all negative expressions (pain, stress, urgency), blue received very low scores, indicating that people perceive it as predominantly positive, despite being categorized as a cool color. Green was the most widely liked color, standing out clearly compared with the others. This is unsurprising, as previously mentioned, it is associated with nature, giving most people a sense of familiarity and closeness. The results for yellow and red were very similar in most respects, which makes sense given that both are strong, highly pigmented, warm colors. They scored particularly high for stress

and urgency, which explains their frequent use in sales promotions, discounts, and warning or caution signs. Red scored high on all negative expressions and low on positive ones, suggesting it is generally a less-liked color but one that effectively provokes action. While red and yellow achieved almost identical scores across most measures, they differed in terms of likability. As the figure illustrates, despite yellow's ability to attract attention and prompt urgency, respondents rated it as equally likable as blue. Finally, black and white produced the most outstanding results overall. White led strongly in associations with cleanliness, while black dominated in associations with luxury. Both colors were also equally associated with the concept of "quality," allowing for the parallels: luxury = quality and quality = cleanliness. Despite these strong positive associations, neither black nor white matched green in terms of likability. Even yellow, which performed strongly for negative associations, received more "likability points" than both black and white. It is important to note that for this question, respondents made associations based on cognitive reasoning rather than emotional response. Therefore, the emotions evoked by each color are not revealed here; this will be addressed in the following section.

5.2.2. Color-Emotion Pairs

Each color was also examined from an emotional perspective. Respondents were asked to assign the six colors to six basic emotions: joy, sadness, fear, anger, disgust, and surprise. In this section of the questionnaire, participants could also provide individual responses, often using synonyms for the listed emotions. These were consolidated to create the table presented below.

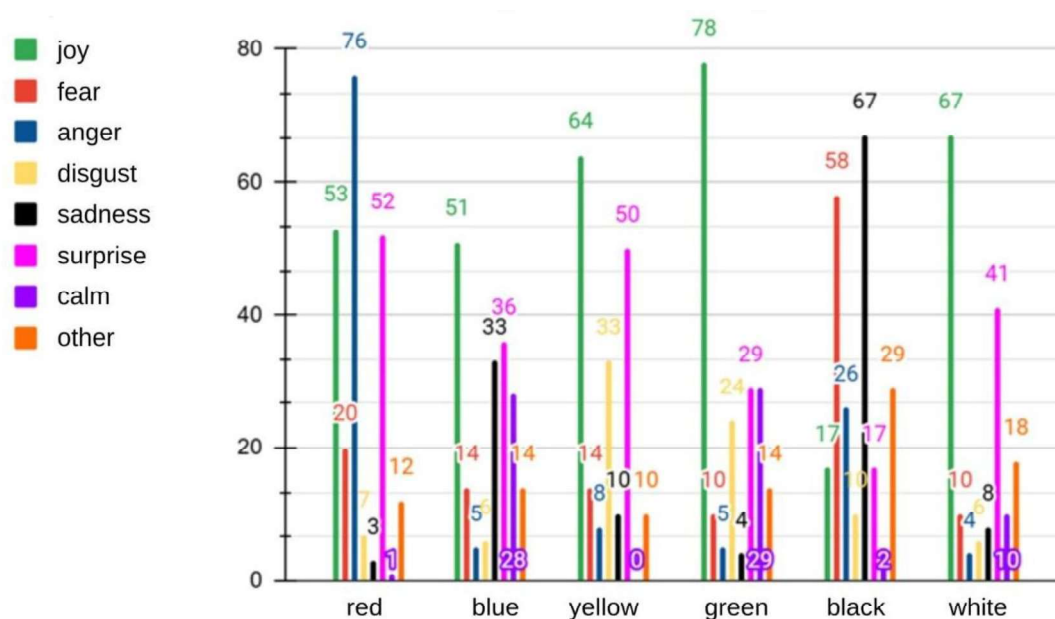


Fig. 2. Results of the color-emotion association (self-edited, 2025)

Since the focus of this question was on emotional rather than cognitive associations, it can be considered a measure of the emotional impact of colors. For nearly every color, "calmness" appeared as a free-text response, and in the diagram it is represented as a separate column, alongside other miscellaneous emotional alternatives. As shown in the figure, red predominantly elicited feelings of anger among respondents, which corresponds with the previous question where it was associated with stress, as the two descriptors are closely linked. In contrast, anger was least associated with blue and green, which are strongly linked to a sense of calm. This is likely influenced by the frequent appearance of these colors in nature, such as the sky, water, grass, and trees. Another notable finding for red was that it also elicited joy and surprise, while calmness

was least associated with it. This confirms that red is linked to all intense emotions, which is unsurprising given its strong pigmentation and typical use in warning signs, both of which provoke strong reactions in humans. Some earlier observations regarding yellow, however, were not fully confirmed. While literature suggested that yellow would be most strongly associated with joy, the survey data indicated otherwise. In the color–emotion pairings, yellow ranked only third for joy, behind green—which far outperformed all other colors and emotions—and white, both of which elicited a stronger sense of happiness among respondents. Black produced predictable results, evoking sadness and fear, which can be associated with death and darkness. Interestingly, black also generated the most “other” responses, suggesting it provokes the most diverse range of emotions and is harder to categorize than other colors, likely due to personal experiences and individual perceptions.

Unexpected results emerged for white. It clearly evoked strong emotions, with joy and surprise being the most prominent. White, as a color of cleanliness and freshness, may be linked to positive associations and likability, which explains these findings. Regarding surprise, all colors except black scored highly, indicating that color perception varies individually—people may visualize different shades of “red,” for example, when hearing the word. The next question explores how people’s evaluations of colors change, if at all, when they are visually presented.

5.2.3. Standing Out from the Crowd

In the following section, respondents were shown a neutral-themed advertisement—chosen to avoid influencing their associations—rendered in the six studied colors. Each image had identical content and layout; the only difference was the color, using exactly the same shades as in the Meta ad research. Participants were asked which colored advertisement captured their attention the most. The figure below presents the results achieved.

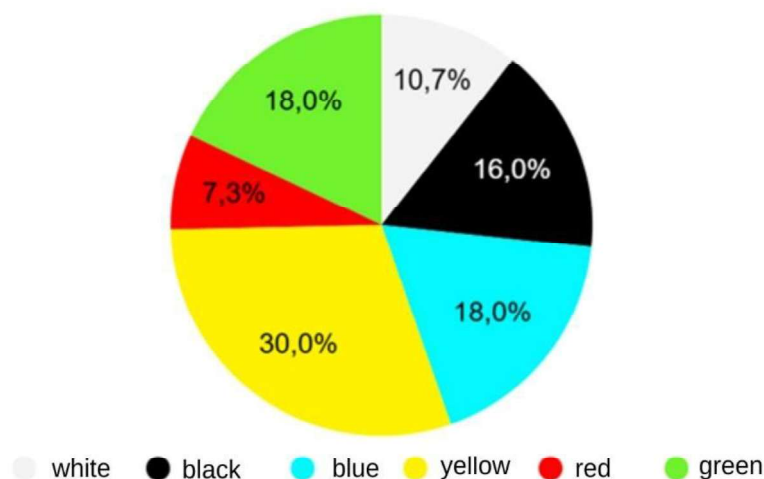


Fig. 3. Percentage of attention grabbing from advertisements (self-edited, 2025)

It is worth mentioning that in the creative content, the text was either black or outlined, while on a black background it was white, to ensure contrast. It can be seen that the yellow advertisement attracted by far the most attention, followed by green and blue. The strong contrast, combined with the highly pigmented and bright colors, contributed to their prominence. However, it is interesting that without their pigmentation – that is, “without their color” – the contrast alone is not as attention-grabbing, as demonstrated in the case of white. In such instances, it is advisable to “swap” the colors and use them in an inverse manner, as shown in the figure, since people considered the black-background advertisement with white text 5.3% more attention-grabbing. The red advertisement performed less well, despite its vivid tone, which may be

attributed to the depth of its shade and the color composition of the text. Given the numerous differences between generations, tastes naturally vary, as each experiences the present stage of life differently. This raises the question of whether there are generational differences in how the color of an advertisement captures attention.

Table 3. Generating Generational Awareness of Ads (self-edited, 2025)

Coulor	Proportion of Generation X	Proportion of Generation Y	Proportion of Generation Z	Proportion of Baby boomer
White	8,82%	10,0%	11,96%	0,0%
Black	2,94%	15,0%	21,74%	0,0%
Blue	23,53%	5,0%	18,48%	25,0%
Yellow	26,47%	50,0%	27,17%	25,0%
Red	8,82%	10,0%	6,52%	0,0%
Green	29,41%	10,0%	14,13%	50,0%

As can be seen in the highlighted data in the table, the preferred colors vary. From the previous figure, it was evident that yellow creatives were considered the most attention-grabbing. However, when the proportions are broken down by age group in the table (also indicated with highlighted cells), it becomes clear that yellow was not the most frequently chosen color in every generation. The two oldest generations surveyed both selected the green advertisement, whereas the Z and Y generations chose the “winning” yellow as the most attention-grabbing. This difference may be attributed to variations in generational lifestyles: the X and Baby Boomer generations tend to live more slowly and deliberately due to their age, while the younger generations are more energetic and active. The two lifestyle patterns and the associated meanings of the colors align perfectly, supporting the findings described in this thesis.

By swapping the vertical and horizontal axes of the table, the interpretation highlights the significance of black and white. These colors were most often selected by the Z generation, followed by Y, X, and finally the Baby Boomer generation. The combination of black and white is most strongly associated with modernity, which is particularly reflected in a linear trend of increasing age yet decreasing emphasis on values using the black-and-white pairing. Naturally, it is rare today to encounter advertisements that use only two colors.

5.2.4. Color combinations

In the previous section, the prominence of the advertisements was analysed, but as noted earlier, black text was always used on colored backgrounds (except for black backgrounds). A key question remains: which colors are most effective to pair in logos or advertisements to achieve maximum attention? The figure below illustrates the results for black and white backgrounds, showing how the same colors (as used previously) performed in terms of which color the survey respondents noticed first.

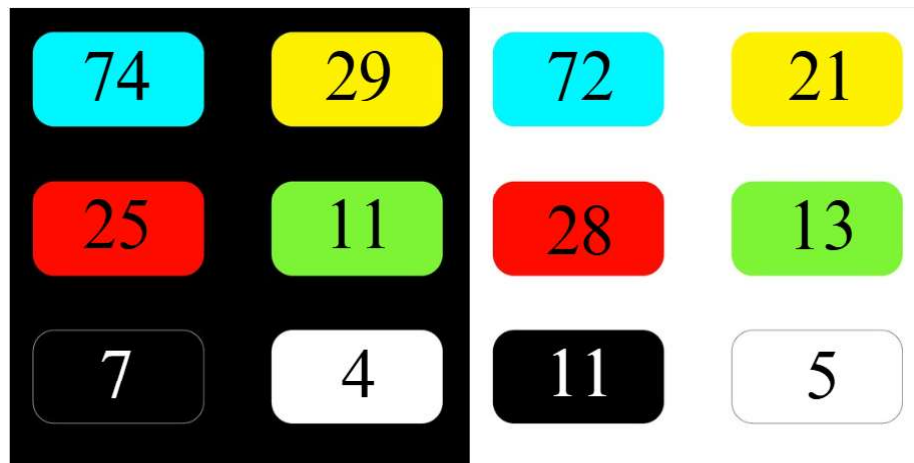


Fig. 4. Color pairing on a black and white background in terms of their attention-grabbing effect (self-designed, 2025)

As can be seen, on a black background the highest score was achieved by blue, with 71 respondents noticing this color first; a similarly high number was recorded on a white background as well. The previously underperforming red color achieved the second-highest result on a white background, while on black it came close but was still surpassed by yellow. In the earlier question, where the winning advertisement was yellow with black text, it now ranked second when paired with black and third when paired with white. The previously popular green color did not stand out as much on either black or white backgrounds, which is naturally influenced by human color perception rather than the popularity or meaning of the color itself. Black and white performed poorly in both cases, but contrary to the earlier findings, the white on a black background was less striking than black on a white background, according to the survey respondents.

6. Conclusion

The main aim of the research was to examine how different colors affect various generations and how they influence emotions, attention, and the motivation to act. The results indicate that the older generations (X and Baby Boomers) are most drawn to the calming blue and green, whereas the younger generations (Y and Z) respond most strongly to energetic yellow. Black and white symbolize cleanliness and quality, particularly for younger respondents. Red can be effective for attracting attention when used sparingly, but excessive use can provoke negative reactions. Green emerged as the most positive color (associated with calmness, sympathy, and happiness), while white surprisingly scored highly for evoking joy and encouraging action. Yellow carried a dual meaning, simultaneously eliciting sympathy and negative emotions. The conclusions suggest that successful marketing communication hinges on precise target audience definition and a clear understanding of the advertisement's purpose—whether to stimulate action or build brand recognition. Color selection can be effective when guided by this knowledge. A conscious, measured use of colors is recommended, as well as careful attention to color pairings, since proportions and contrasts significantly influence impact. For future research, the use of black and white in advertisements remains an open question. Although both convey clarity and quality, the two studies produced contradictory results, indicating that further investigation is warranted. The research is limited by people's current emotions, as well as their quality of life and place of residence. Therefore, it is important for future research to take all of these factors into account, to place greater emphasis on each color according to the field of work, and to consider the proportions of the colors used.

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Conflict of Interest Statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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