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Evaluation of Emotional Content Advertisements by Neuromarketing Methods

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Abstract

The purpose of this study is to examine the impact of emotional advertisements on consumers using neuromarketing and traditional research methods. In the study, two emotional advertisements containing elements of sadness and humor were shown to consumers, and their responses to these advertisements were measured. For this purpose, eye tracking, facial expression recognition, galvanic skin response, and recall tests were administered to 34 participants. Additionally, questions related to the advertisements they watched were asked. The data obtained were calculated using SPSS, Excel, and the interfaces of neuromarketing programs. The study included analyses such as frequency and percentage distributions, correlation analysis, t-tests, face coding graphs, heat maps, and consumer attention graphs. The results revealed that emotional advertisements themed around humor and sadness had positive effects on consumers, both advertisements were watched with interest, the interest dropped in certain parts of the advertisements, and the slogans of the advertisements were not sufficiently remembered by the participants.

Keywords: Emotional Advertising, Neuromarketing, Advertising Effectiveness.

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1. INTRODUCTION

The advertising industry is evolving due to increasing competition and easier access to consumers. Today's consumers can receive information from various channels. The global advertising market reached $647.3 billion in 2023. This figure grows every year (Agarwal & Nath, 2023). Promotions carried out in different areas such as social media, billboards, digital channels, and outdoor advertising contribute to the sector and bring forth creative and innovative types of advertisements.

The significant growth of the advertising industry increases competition and makes it more challenging for consumers to be influenced by these promotions. Today, people are exposed to approximately 4,000 advertising messages daily (Flynn, 2023). This situation necessitates the use of various methods to reach consumers. The most effective way to influence people now is through advertisements that connect with them. Companies attempt to engage consumers through emotional appeals, enhancing advertisement appeal with elements such as empathy, love, humor, happiness, excitement, and sadness. Research shows that emotional factors can affect consumers, reduce ad skipping rates, and play a significant role in advertising strategies (Ihsan & Junaidi, 2022; Jeon et al., 2024; Naidu, 2023). According to a study by Nielsen, advertisements that create an above-average emotional impact can influence 31% of consumers and increase sales volume by 23% (B2Press, 2022.).

This study examines the impact of frequently used emotional elements, sadness, and humor, in commercials on consumer perception. It investigates how these two factors, which evoke different emotions, are perceived by consumers and how they affect purchasing behavior. Existing literature shows that the use of humor in advertisements can positively influence consumers' purchasing decisions when combined with informational and persuasive elements (Kewlani et al., 2022). Humor can capture the audience's attention, making the message easier to remember and adopt. Additionally, humor can create an emotional bond, fostering sympathy and trust towards the brand. Studies have shown that when humor in advertisements is effectively combined with information and persuasion, it can positively influence consumers' purchasing decisions (Kewlani et al., 2022). On the other hand, sad advertisements are seen to be more effective in establishing an emotional connection with consumers and facilitating their identification with the brand. A sad story or memory can evoke emotions in the viewer, eliciting feelings of empathy and compassion. These emotions can lead to feelings of sympathy and loyalty towards the brand, influencing purchasing decisions (Becan, 2021; He & Li, 2016).

Emotions used in the advertising industry are at the heart of the relationship between consumers and brands, influencing both conscious and unconscious decisions, making it a vital component of successful advertising (Anuar & Isa, 2022). In this study, neuromarketing devices measuring consumers' physiological responses were used to calculate viewers' emotional changes, attention, and focus levels. After showing the viewers a commercial, a test was conducted to determine the recall rates of the advertisements, followed by a related survey. Thus, the study aimed to understand both the physiological

and cognitive responses of consumers. By using both new and traditional research methods, the effects of sad and humorous elements in advertisements on consumers were explored.

2. LITERATURE REWIEV

2.1. Emotions in Advertisements

In advertisement texts, emotions play a critical role in establishing an emotional connection between consumers and brands, making products memorable and influencing purchasing decisions (Panthen & Germelmann, 2023). Emotional advertising strategies evoke consumers' emotional responses, leaving a lasting impression of the brand in their minds. Scientific research has shown that emotional advertisements increase the likelihood of consumers remembering the ads and influence their purchasing decisions. In this context, the use of emotional advertisements enables consumers to form deep connections with brands and determine their purchasing preferences (B2Press, 2022).

Emotions serve a fundamental role in shaping consumer-brand relationships, influencing both conscious and unconscious decision-making. Effective advertising heavily relies on emotional responses, as emotions are significant factors that influence behavior and decision-making processes (Gumber, 2022). In modern societies, as consumers' tendency to make emotion-based decisions increases, emotional advertising has begun to play an increasingly decisive role in capturing consumer interest (Qutp et al., 2022).

Emotional processing often precedes logical reasoning (Soti, 2022). Consumers often assume that their purchasing decisions are driven by rational analysis of available alternatives. However, emotional reactions occur 3,000 times faster than rational thinking when making purchasing decisions (Kylila & Elgeka, 2024).

Companies use different emotional appeals such as love, humor, happiness, excitement, fear, and sadness in advertisements to influence customers' purchasing decisions (Kamran & Siddiqui, 2019). Such emotional appeals not only exert a stronger impact on the target audience but also enhance the shareability of the advertisement content. While most people may not want to share a video or blog post intended for informational purposes, they are more likely to share something they find funny or uplifting with other consumers. These online shares facilitate increasing brand awareness (Gartlan, 2023).

There are numerous studies on the impact of emotions on the advertising industry and its connection to the purchasing process. In their study, Mishra and Patil (2023) found that consumers in the 21st century tend to make decisions emotionally, moving away from the message-based marketing of the 20th century. This shift has increased the success of advertisements based on human emotions today. Bou Saada et al. (2023) revealed that positive attitudes towards emotional marketing lead to positive actions towards the brand. Hashem et al. (2020) found that emotional marketing plays a significant role in influencing brand loyalty among female consumers in the cosmetics industry. Anwer et al. (2021) showed that positive emotions such as love, laughter, and happiness positively affect

customers' purchase intentions and that there is a significant relationship between emotional advertising and consumer buying behavior. Derinözlü (2019) discovered a positive relationship between emotional advertising appeals and brand preference in his study on luxury products.

The use of emotions in the advertising sector includes positive stimuli such as love, loyalty, humor, and happiness, as well as negative stimuli such as sadness, fear, and hatred (Ateş, 2016). Among these, humor and sadness are particularly opposites. In advertising, the integration of sadness and comedy elements is considered a critical methodology to deeply resonate with consumer sentiments and enhance communication effectiveness. In cultures where emotional dynamics are dominant, sadness has the potential to touch individuals' inner worlds, while comedy adds an attractive and attention-grabbing dimension to advertising content. Scientific studies have shown that these two emotional elements are frequently used methods in advertising strategies to communicate with the target audience and present persuasive messages (Becan, 2021).

2.2. The Sadness Factor Used in Advertising

The use of sadness in advertisements is a strategic method designed to trigger consumers' emotional responses. Existing literature indicates that sad content in advertisements can have a significant impact on consumer behavior (Kemp et al., 2013). It is believed that individuals are more inclined to consume hedonic products when they are sad compared to when they feel fear or anxiety. Additionally, although sadness is generally perceived as a negative emotion, it has been observed to contribute positively to brand attitudes in the context of narrative advertising (Yang, 2022). The strategic integration of sad elements into advertisements suggests that it can help establish stronger emotional connections between consumers and the brand, shaping consumers' brand perceptions positively (Septianto, 2021). Emotional advertisements that evoke sadness often create a powerful message by fostering empathy and a sense of connection, leading to deeper emotional appeal and motivating people to take action (O'Hara et al., 2023).

Brands have recognized the effectiveness of using emotional content to raise social awareness on issues such as violence, gender equality, poverty reduction, migration, and other social topics (Weber, 2024). Although sadness may initially seem less appealing from an advertising standpoint, it can serve as a powerful strategic tool for advertisers to connect with their target audiences on a deeper level (Kemp, et al. 2013).

There are numerous studies on the impact of sadness in the advertising sector. For instance, in the study titled "The Emotional Effectiveness of Advertising," published in Frontiers in Psychology by Otamendi and Sutil (2020), cognitive-emotional neuroscience was utilized to measure the effectiveness of advertisements by analyzing individuals' unconscious emotional responses. The study employed a computer program called AFFDEX. The results showed that different age and gender groups developed distinct emotions and reactions in response to the advertisements. In another study by Kang et al. (2022),

the effects of using sad-faced individuals in social welfare advertisements were compared to those of neutral and happy-faced individuals, exploring how these expressions influenced consumers. The data indicated that an image of a sad face not only evoked sympathy but also led to inferences about the company's intention to emotionally influence people.

The study found that sympathy increased charitable donations. In a study by O'Hara et al. (2023) on smoking cessation, it was shown that campaigns with sad messages prompted people to consider quitting smoking, but this did not directly translate into quit attempts.

In his study on the element of sadness in advertisements during the Covid-19 period, Becan (2021) emphasized that social media users exhibited a positive attitude towards the sadness-laden advertisements presented by the relevant brands in the context of the pandemic. Pirus and Zulqahar (2018), through in-depth interviews using qualitative methods, found that sad advertisements were perceived as more appealing by consumers. They also found that advertisers strategically aimed to evoke emotions such as sadness and melancholy to emotionally connect with consumers.

2.3. The Humor Factor Used in Advertising

Humor finds a wide range of applications in advertising. It is frequently used in marketing strategies to attract consumer attention, enhance brand recall, and increase awareness by making the advertisement content shareable on social networks. Scientific studies have shown that humorous content significantly enhances the effectiveness of advertisements, especially when it is consistent with the product (Güz & Atkan, 2021). Humor also creates a positive impact on the target audience, supporting the engagement of the advertisement (Dökeroğlu & Gökçearslan, 2020). However, the misuse or inappropriate use of humor can damage the brand's image and provoke negative reactions from consumers. Therefore, the incorporation of humor in advertising texts should be approached meticulously and strategically (Aksoy, 2015). Companies generally use humor in advertisements for the following reasons:

Creating an Emotional Bond: Humor presented through advertisements has the potential to establish a deep emotional connection between consumers and brands. The positive impact of a humorous ad on viewers allows the ad to occupy a more lasting and meaningful place in their memories, which can contribute to increased sales in the long term.

Attention-Grabbing Ability: The element of humor makes advertisements attention-grabbing, helping products or services to be more easily noticed by consumers. Humor enhances the overall appeal of the ad, attracting consumer interest and making the brand's message stand out (Akbar & El-Gohary, 2021).

Viral Potential: Humorous ads are more likely to be shared on social media platforms. This increases the reach and impact of the ads without requiring additional advertising investment (Bishop, 2014).

Reflecting Brand Personality: Humor reflects the brand's personality, allowing the company to present a more human and approachable image.

Overcoming Sales Resistance: Effectively used humor can reduce consumers' natural resistance during the purchasing process, making the conveyed message clearer (Chelsea et al., 2020).

There are numerous studies on the use of humor in the advertising sector. Solak's (2017) research showed that companies in the banking sector attempt to address potentially intimidating concepts such as high-interest rates, indebtedness, loans, and mortgages through humor. Dökeroğlu and Gökçearslan (2020) noted that using humor in sectors like finance, insurance, and health could harm the brand if the message is misunderstood. They also mentioned that the strong impact of humor could sometimes overshadow the main message the company intends to convey. Tekeli (2017) found that consumers enjoy watching humorous advertisements and remember them better.

Hoang (2013), in his thesis, found that humor in advertisements not only grabs attention and aids recall but also contributes to the likability of both the advertisement and the advertised brand. Kasilingam and Ajitha (2022) demonstrated that the most crucial determinant of attitude towards humorous storytelling advertisements is the emotional response, and these advertisements contribute more to brand attitude formation compared to dramatic storytelling advertisements. Eisend (2009) revealed that using humor in advertising significantly increases attention, positive affect, recall of the advertisement and the brand, and purchase intention.

Kewlani et al. (2022) pointed out that despite the widespread use of humor in advertising, it is not sufficient on its own to influence consumer purchasing decisions. However, when combined with informative and persuasive elements, it can achieve success. Agwu (2022) highlighted the importance of cultural factors in using comedy in advertisements, emphasizing that understanding the varying cultural nuances in different societies is critical for effective advertising strategies. McLeod et al. (2022) found that when humor aligns with the brand's personality, it positively affects brand recall, purchase intention, and attitudes towards the brand. However, mismatches between the type of humor and the brand's personality can lead to confusion and disappointment among the target audience, reducing the advertisement's effectiveness.

Overall, studies indicate that humor is a frequently employed factor by companies in advertisements, enhancing the ad's effectiveness, recall, and purchase intention. It is also essential that humor aligns with the brand and is shaped according to cultural codes, which are crucial strategic considerations.

2.4. Evaluation of Emotional Advertisements Using Neuromarketing Method

Neuromarketing is a discipline that examines brain activities and physiological responses to measure the emotional impact of advertisements. Research in this field provides objective data that can help marketers optimize their ads and evoke the desired emotional responses. This allows

neuromarketing to offer significant advantages over traditional advertising evaluation methods (Anuar & Isa, 2022). Consumers' emotions influence their decision-making processes and behaviors (Pluta-Olearnik, & Szulga, 2022). Neuromarketing explores the emotional dimension of consumer decision-making processes using neuroscience tools, highlighting the importance of emotions and the subconscious mind in purchasing decisions (Birknerová et al., 2022). Various neuromarketing techniques are used to evaluate emotional advertisements.

Among these, the most common ones are:

Electroencephalography (EEG): Measures the brain's electrical activity to evaluate emotional valence (positive or negative) and arousal levels (Muhammad et al., 2023).

Functional Magnetic Resonance Imaging (fMRI): Provides detailed brain activity images showing which areas of the brain are activated by specific advertising elements (Josephs et al., 1997).

Eye Tracking: Monitors which parts of the advertisement viewers pay attention to and for how long. Eye tracking is a state-of-the-art process that follows users' eye movements (Ke et al., 2024)

Facial Expression Analysis: Analyzes viewers' emotional responses based on their facial expressions (Li et al., 2025).

Galvanic Skin Response (GSR*):* Measures changes in skin conductivity reflecting emotional arousal (Satapathy et al., 2024).

2.5. The Purpose and Significance of the Study

Emotions have a significant impact on human behavior. Studies show that up to 92% of purchasing decisions are based on emotions rather than logic (Xavier, 2023). The primary aim of this study is to evaluate emotionally charged advertisements, expected to influence human behavior, using neuromarketing methods. The study specifically examines two different emotional advertisements: humor and sadness. By doing so, it seeks to explain comparatively how these two contrasting themes emotionally affect consumers. While previous literature has addressed the factors of sadness and humor separately, there has not been a study that compares them and measures their impact using neuromarketing tools. In this respect, the study holds a unique place in the literature.

In 2023, global advertising revenue for media owners is estimated to be around 926 billion dollars (Statista, 2024). The advertising sector is growing each year, making it essential to investigate the extent to which the frequently used emotional factor in advertisements influences consumers. Conducting this research with various measurement methods and techniques will increase its reliability. Therefore, this study combines traditional research methods with neuromarketing techniques.

3. METHOD OF THE RESEARCH

In the study, a combination of a traditional research technique, a questionnaire, Facial Coding, Eye Tracking, and Galvanic Skin Response (GSR) was used. The questionnaire developed for the study consists of three sections. In the first section, participants were asked recall questions related to the advertisement. These questions were adapted from the study by Yıldız and Uztuğ (2017). Additionally, participants were asked which of the two advertisements they watched they liked more in this section. In the second section of the questionnaire, participants were asked questions about their attitudes towards the advertisement and their purchase intentions. The questions in this section were adapted from the studies of Başaran and Yıldız (2022) and Edwards (1995) and were structured using a 5-point Likert scale. In the final section of the questionnaire, there are questions related to the demographic characteristics of the participants. The data obtained from the questionnaire and neuromarketing devices were analyzed using the SPSS 15.0 program, and frequency and percentage distributions, Cronbach's Alpha, Correlation, and Variance analyses were conducted. In the present study, participants' reactions to specific parts of the advertisement (e.g., emotional scenes) were directly measured, and the advertisements were pre-categorized as emotional. Therefore, requesting participants to confirm this classification was deemed unnecessary and considered a redundant procedure. Consequently, manipulation check questions were not included in the questionnaire.

In the study, parametric tests were used to increase the statistical power of the analysis of the questionnaire data. To use these tests, certain prerequisites need to be met, such as having a sample size of over 30, data showing a normal distribution, subjects being independent of each other, and being randomly selected (Can, 2014). Additionally, for the data to show a normal distribution, the Skewness and Kurtosis values of the items on the scale must be within the range of +1.5 to -1.5 (Tabachnick & Fidell, 2013). Since all the necessary prerequisites were met in the study, parametric tests were used.

The primary neuromarketing technique addressed in the study is the Eye Tracking Method. This technique involves the process of tracking eye movements to analyze individuals' visual attention distributions (Ke et al., 2024). In the research, an Eye Tracking application developed by RealEye, which measures via webcam, was used. The RealEye platform provides a test mechanism that can measure eye movements at a speed of 60 Hz per second (RealEye, 2024). This means that the eye-tracking device can detect 60 different positions every second (Farnsworth, 2023). Additionally, the ability to conduct eye-tracking tests over the web, without the need for participants to use an additional device, allows the participants to be in a more comfortable environment during the experiment.

Validity in eye-tracking systems is determined by the extent to which the measurement tool accurately detects gaze points and produces meaningful results. In this context, the RealEye eye-tracking system is considered a valid measurement tool for remote and web-based research.

Internal validation studies conducted on the accuracy of the RealEye system report an average accuracy range of 115-125 pixels. Depending on data quality, the average accuracy for data classified as “good” has been measured at 123 pixels. Furthermore, the highest recorded accuracy level has been determined as 61 pixels. In terms of accuracy distribution across the screen, the best results have been observed in the central-bottom region, whereas the lowest accuracy has been recorded in the bottom-right corner.

Regarding precision, the system’s average precision ranges between 74-77 pixels, with the highest precision recorded at 29 pixels. Particularly in metrics such as attention distribution and gaze duration, RealEye has demonstrated consistent and reliable results depending on data quality. When calibration procedures are carefully applied and appropriate environmental conditions are maintained, the system's accuracy level is reported to fall within acceptable limits (RealEye, 2024). In the study, out of the 34 measurements obtained from participants, 19 were classified as "good" and 15 as "very good" in terms of data quality. These findings indicate that the RealEye eye-tracking data used in the study provide reliable and valid measurements.

This study utilized the facial expression recognition method developed by RealEye, an AI-supported system based on the Facial Action Coding System (FACS). FACS codes facial muscle movements into action units (AUs) and was developed by Hjortsjö (1969) later expanded by Ekman and Friesen (1978), for emotion recognition. The RealEye platform applies FACS to analyze participants’ surprised, happy, and neutral expressions in real time (RealEye, 2024). By tracking facial muscle movements, the system classifies emotions based on responses to stimuli. Compared to traditional self-report methods, this approach enhances the study’s reliability by providing a more objective emotion analysis (Lewinski et al., 2017). In the study, face coding is utilized to analyze participants' facial expressions while watching advertisements, and the extracted data is visualized in a graphical format at the end of the advertisement. The RealEye system is capable of generating these graphs on an individual basis as well as aggregating them as average values obtained from all participants. Additionally, it measures participants' responses to the advertisement on a second-by-second basis, providing a detailed analysis of their emotional reactions throughout the viewing experience.

The third neuromarketing method used in the study is Galvanic Skin Response (GSR). This technique measures the electrical conductivity of the skin, which varies according to moisture levels (Farnsworth, 2023). In neuromarketing, it is used to measure consumers' emotional engagement and arousal levels in response to marketing stimuli (Mancini, 2025). During the experiment, a Grove GSR galvanic skin response detector connected to an Arduino UNO board, managed through the Arduino Integrated Development Environment (IDE) on a laptop, was used. During the measurement process, continuous data was recorded for each participant throughout the advertisement duration and subsequently transferred to Excel. The data were standardized using mean-based normalization to ensure comparability among individuals. The normalization process was conducted through the following

steps: The raw data was measured within the range of 0-600. Then, the maximum and minimum values for each participant were identified, and the data were transformed into z-scores. After normalization, the data became suitable for comparisons between individuals (Yiğit, 2020). The data obtained were analyzed using SPSS 15 software.

The population of the study consists of consumers. In eye-tracking studies and neuromarketing methods such as EEG, 34 participants are sufficient to measure the effectiveness of a commercial with 90% accuracy (Koşar & Tor Kadıoğlu, 2020; Şenduran, 2019). Therefore, 34 participants were included in the study. The participants were selected using a simple random sampling method.

While collecting data, participants were included in the study in a quiet room, as free from emotional stimuli as possible, with a standard seating distance of 65 cm from the screen. Additionally, participants were informed about the devices, reassured that the devices posed no health risks, and that the data obtained would be used solely for scientific purposes. They were also given assurances regarding ethical permissions.

In the study, participants were shown two advertisements. The selection of the advertisements was based on the message framing theory. This theory assumes that consumers will react differently to the same topic depending on the framing, aiming to measure behaviors through contrasts such as gain-loss, concrete-abstract, and emotional-rational (Florence et al., 2022). In the research, participants were shown Vodafone's "Mother's Day" advertisement, which contains elements of emotion and sadness, and Profilo's "I Miss My Mom" advertisement, which is entertaining and humorous. Thus, the same topic was evaluated using two advertisements with different emotional characteristics.

In this study, we employed a dual-method validation strategy to determine whether the advertisements effectively conveyed elements of sadness and humor. Initially, a panel of five marketing and advertising academics, recognized experts in their respective fields, assessed the content to ensure it accurately reflected the intended emotional tones. This approach aligns with Lawshe's (1975) content validity framework, which underscores the significance of expert judgment in evaluating the essentiality of content within a specific context. Subsequently, a pre-test was conducted with five participants from the target audience to observe their emotional responses to the advertisements, thereby providing empirical evidence of the advertisements' efficacy in eliciting the desired emotions. The integration of expert evaluation and audience pre-testing fortifies the robustness of our content validation process.

In selecting the advertisements, care was taken to ensure that their durations were relatively similar, with the Profilo advertisement lasting 83 seconds and the Vodafone advertisement 60 seconds. To enhance participant impartiality and ensure each advertisement was viewed objectively, the randomization feature within the Realeye system was activated, resulting in half of the participants viewing the Profilo advertisement first and the other half viewing the Vodafone advertisement first. Additionally, a 10-second black screen was inserted between the two advertisements to balance visual

adaptation and cognitive load. Following the advertisement viewings, participants were administered a series of survey questions.

4. FINDINGS

Of the participants in the study, 58.8% are male, 55.9% are in the 21-30 age range, and 61.8% are university graduates. The proportion of married participants is 23.5%, while the proportion of single participants is 76.5%.

Table 1. Demographic Characteristics of Participants

Variables	N	Percentage (%)	Variables	N	Percentage (%)
Gender			**Marital Status**		
Male	20	58.8	Married	8	23.5
Female	14	41.2	Single	26	76.5
Total	34	100	Total	34	100
Age Group			**Graduate**		
10-20	4	11.8	Primary school	1	2.9
21-30	19	55.9	High school	2	5.9
31-40	7	20.6	Associate degree	2	5.9
41-50	4	11.8	Undergraduate	21	61.8
Total	34	100	Postgraduate	8	23.5

4.1. Reliability Analysis

Cronbach's Alpha analysis was conducted to determine the internal consistency and reliability of the questionnaire. Cronbach's Alpha is used to assess the homogeneity of the questionnaire (Yıldız & Uzunsakal, 2018). As a result of the research, the Cronbach's Alpha value of the study was calculated to be 0.909. According to this result, the questionnaire is highly reliable.

4.2. Recall Questions Directed to Participants

Participants were asked four recall questions related to the study. These questions were posed immediately after watching the advertisements. According to Table 2, while most participants remembered which company each advertisement belonged to, they had difficulty recalling the slogans of the advertisements. The company of the second advertisement by Profilo and the slogan of the Vodafone advertisement were remembered slightly more. In the present study, although emotional engagement was found to be strong and brand recall rates were relatively high, slogan recall rates remained notably low.

This finding partially aligns with previous research (Toker & Sulak, 2020), which demonstrated that emotional appeals in advertisements significantly enhance consumers' general memory of brands and advertising content.

However, emotional engagement does not always guarantee the detailed encoding of specific verbal elements such as slogans.

Table 2. Participants' Recall Rates for Advertisements

Statements	Correct (%)	Incorrect/ Do not remember (%)
Which company was the first advertisement from?	79.4	20.6
Which company was the second advertisement from?	82.4	17.6
What was the slogan of the first advertisement?	14.7	85.3
What was the slogan of the second advertisement?	11.8	88.2

4.3. Participants' Attitudes Towards Emotional Advertisements

Participants were asked to rate the advertisements they watched on a scale of 1 to 5, with 1 being the least liked and 5 being the most liked. According to the results, participants gave an average score of 3.82 to the first advertisement, Vodafone's emotional advertisement, and a score of 4.29 to the second advertisement, Profilo's humorous advertisement.

Table 3 shows the participants' attitudes towards the first advertisement, Vodafone's advertisement. According to the table, the statement that participants agreed with the most was "I liked the first advertisement I watched," while the statement they agreed with the least was "I will gather more information about the product/service I saw in the first advertisement.

Table 3. Participants' Attitudes Towards the First Advertisement (Vodafone/Profilo Advertisement)

Statements	N	Vodafone (X)	Vodafone (Standard Deviation)	Profilo (X)	Profilo (Standard Deviation)
Purchase Intent					
I would like to use the product/service I saw in the first advertisement	34	3.15	1.105	3.26	1.263
I will gather more information about the product/service I saw in the first advertisement	34	2.74	1.024	2.91	1.240
I have developed a willingness to purchase the product/service I saw in the first advertisement	34	2.74	1.024	3.03	1.337
Attitude Towards the Advertisement					
I liked the first advertisement I watched	34	2.97	1.114	4.06	1.043
The first advertisement I watched appealed to me	34	3.79	1.067	4.03	1.000
The first advertisement I watched seemed interesting to me	34	3.76	1.075	3.97	.937

4.4. Participants' Attention Averages and Fixation Values for Advertisements

The advertisements shown to the participants in the study had the same theme but differed in content and messages. Table 4 presents the attention and fixation values obtained from the participants.

The average initial fixation time indicates how quickly participants began to focus on the advertisement they watched (Lewandowska, 2023). Participants' initial fixation time for the Vodafone advertisement was 0.76 seconds, while for the Profilo advertisement, it was 0.8 seconds on average. The average time spent represents the average duration participants spent looking at the advertisement (Lewandowska, 2023). Time spent watching the advertisement explains the interest in the ad. The average time spent on the Vodafone advertisement was 52.56 seconds. Considering the advertisement duration was 60 seconds, approximately 87% of the advertisement was actively watched. The total duration of the Profilo advertisement was 87 seconds, with participants spending 72.3 seconds watching it. This means 82% of the advertisement duration was watched with interest. Another important value in eye-tracking studies is the average attention. This value indicates how attentively the advertisement was watched. According to Table 4, the attention value for both advertisements was the same (0.36). The average revisit shows how many times participants returned to look at an area on average. Participants may look repeatedly at an area due to high interest, confusion, or dislike. Therefore, this value can result from positive or negative reasons (Farnsworth, 2023). The average revisit in the Vodafone advertisement was 4.09, whereas in the Profilo advertisement, this value was 10.24.

Table 4. Consumers' Attention and Fixation Values Obtained by Eye Tracking Method

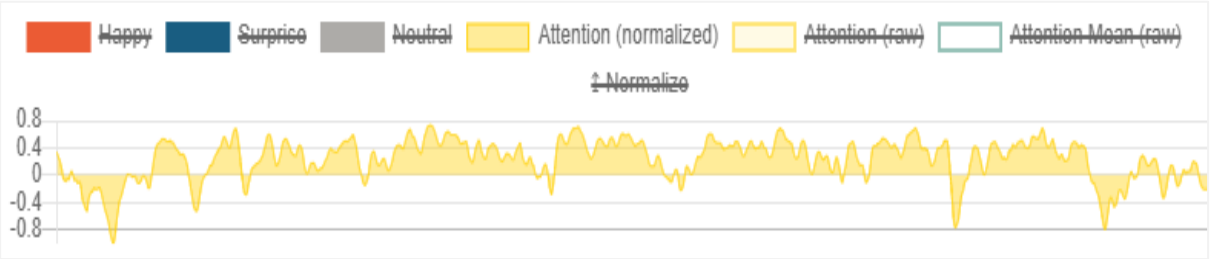
Metrics	Vodafone Advertisement	Profilo Advertisement
Average Initial Fixation Time (seconds)	0.76	0.80
Average Time Spent (seconds)	52.56	72.3
Advertisement Duration (seconds)	60	87
Percentage of Advertisement Actively Watched	87%	82%
Average Attention Value	0.36	0.36
Average Revisit	4.09	10.24

In Figure 1, the attention graph of the first advertisement, the Vodafone advertisement, is shown. Throughout the advertisement, the viewers' attention values generally did not fall below zero. Viewers watched the advertisement more attentively at the beginning and in the middle of the time frame. In the final scene of the advertisement, the "Packshot" section, which contains the main message of the advertisement and usually includes the slogan, viewer interest decreased. This situation is unfavorable for the advertisement.

Figure 1. Consumer Attention Graph (Vodafone ad)

In Figure 2, the attention graph of the Profilo advertisement is shown. According to the figure, participants paid less attention to the advertisement at the very beginning and the end, with attention values dropping below zero during these phases. However, overall attention given to the advertisement remained above zero. Similar to the Vodafone advertisement, the decrease in interest during the "Packshot" section is unfavorable for the advertisement.

Figure 2. Consumer Attention Graph (Profilo ad)



As illustrated in Figures 1 and 2, although participants maintained high levels of visual attention throughout most parts of the advertisements, a significant decline was observed during the final "packshot" sections. According to Florence et al. (2022), the way messages are framed—whether emphasizing gains, losses, or emotional appeals—can significantly influence the depth of cognitive processing and attention allocation. Therefore, the observed decline in attention during the final branding moments suggests that without a strategically framed message that maintains cognitive engagement, critical elements such as slogans may fail to be effectively encoded into memory.

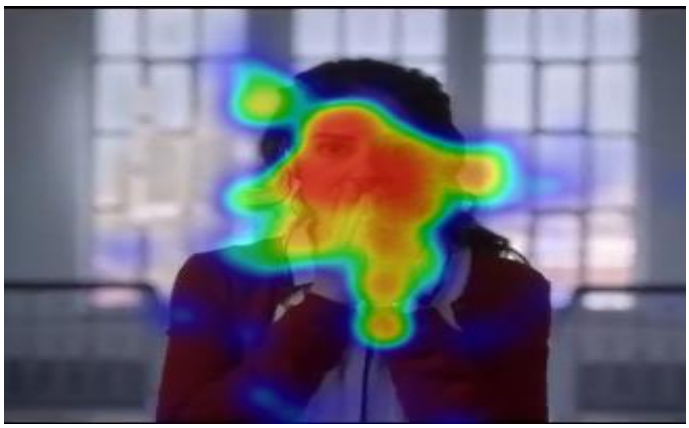
4.5. Heatmaps for Ads

Heat maps are a digital visualization tool that uses color to represent the areas of an advertisement that receive the most and least attention from users, based on temperature degrees. Typically, red and orange tones indicate areas of highest interaction, while blue and green tones represent areas of lesser interest. The sections of the advertisement with the most intense interaction are referred to as "hot spots" (Gasco, 2020; Wedel & Pieters, 2008).

Figure 3 shows the heat map of the most attentively watched scene in the Vodafone advertisement. The most attention-grabbing scene of the Vodafone advertisement occurs at the 31.5-second mark. The average attention value at this point is 1.00. This most attentively watched scene also

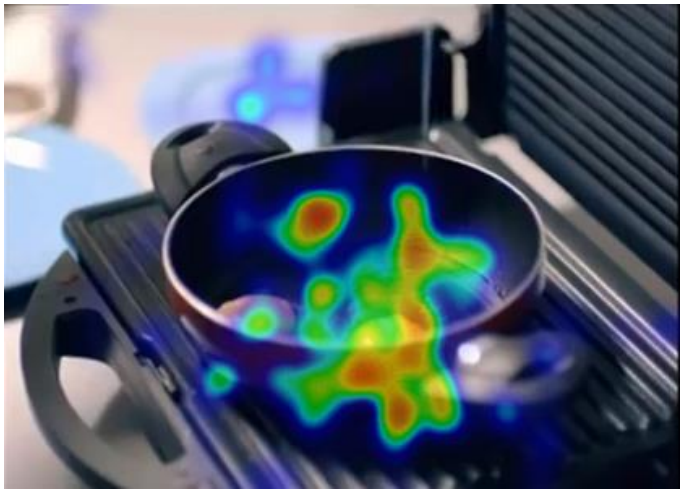
contains one of the most emotional moments of the advertisement. Viewers particularly focused on the face of the female actor in this scene.

Figure 3. Heat Map of The Scene with The Highest Attention Value in The Vodafone Advertisement



In Figure 4, the most attentively watched scene of the Profilo advertisement is shown. At the 38-second mark, the scene where the sausage is being cooked in a toaster has an average attention value of 0.71, making it the most attentively watched scene in the advertisement. Participants found this scene particularly interesting.

Figure 4. Heat Map of The Scene with The Highest Attention Value in The Profilo Advertisement



4.6. Facial Expression Analysis of Participants

Facial expression analysis is a technology aimed at measuring human emotions through facial expressions. This process is carried out by computer algorithms that record and analyze facial expressions via a webcam. The algorithms analyze the movements of the eyebrows, eyes, mouth, and cheek muscles to identify basic emotions such as happiness, sadness, anger, fear, and surprise (https://en.wikipedia.org).

Figure 5 shows the happiness and surprise graphs derived from the Facial Expression Analysis of participants watching the emotionally-themed Vodafone advertisement. The red line represents

participants' happiness expressions, while the blue line indicates their surprise expressions. According to the figure, participants exhibited slight happiness expressions, especially towards the end of the advertisement. Since this value is between 0 and 0.1, it is quite limited. The surprise expression is very close to a value of 0. The positive message delivered towards the end of the advertisement caused participants to display expressions of happiness.

Figure 5. Vodafone Advertisement Face Coding Chart

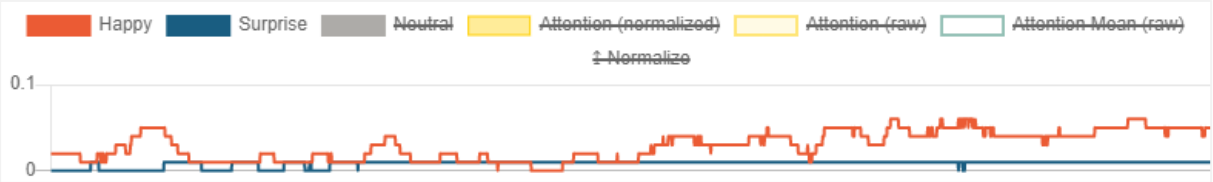
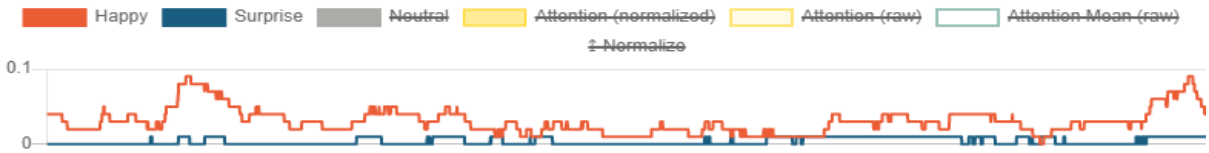


Figure 6 shows the graph of Facial Expression Analysis of participants in response to the humor-themed Profilo advertisement. According to the figure, participants displayed happiness expressions primarily at the beginning and the end of the advertisement, with this value nearing 0.1. The surprise expression remained quite limited throughout the advertisement. It is to be expected that the humor-themed advertisement elicited slightly more happiness expressions from participants compared to the other advertisement. This outcome aligns with the purpose of the advertisement.

Figure 6. Profilo Advertisement Face Coding Chart



4.7. Galvanic Skin Response (GSR) Values and Comparative Analyses Related to Advertisements

The Galvanic Skin Response (GSR) is a method that measures the electrical conductivity of the skin in response to certain stimuli. Especially when people experience something emotional, sweat glands are involuntarily triggered, making the skin more conductive to electricity. GSR measures small changes in the electrical conductivity of our skin in response to stimuli (Albert & Tullis, 2023).

The table below shows the average Galvanic Skin Response values obtained from the participants. According to the results, the average skin conductivity for the sad-themed Vodafone commercial is 0.39, while for the humor-themed Profilo commercial, this value is 0.42 (Table 5). Therefore, the arousal levels of the participants are higher for the Profilo commercial. GSR measurements are used to determine the intensity of emotions, which, although not indicating the direction of the emotions, shows how intensely they are felt. Increases in GSR are directly linked to emotional experiences, highlighting the physiological significance of various emotional responses

(Kreibig, 2010). According to the results obtained from the study, the Profilo commercial caused more emotional experience in the participants.

Table 5. Participants' Mean Galvanic Skin Response Obtained from Advertisements

Advertisement	Average GSR Value
Vodafone (emotional)	0.39
Profilo (humorous)	0.42

Since the GSR technique measures emotional changes, it is believed that the data obtained from it is related to long-term memory. This means that consumers can remember the messages they are exposed to for a long time (Dinç, 2018). Therefore, the recall rates were compared with the GSR values of the participants. According to the correlation analyses shown in Table 6, no relationship was found between the GSR values and recall rates for either advertisement.

Table 6. The Relationship Between Data Conductivity Values (GSR) and Ad Recall Rates

GSR Value		Advertisement Name Recall	Advertisement Slogan Recall
Vodafone	Pearson Correlation	-.006	.002
	Correlation	.975	.992
	N	34	34
Profilo	Pearson Correlation	-.133	-.111
	Correlation	.452	.531
	N	34	34

Table 7 shows the comparison between the participants' liking scores for the advertisements and the emotional changes obtained from the GSR analysis. This analysis investigates whether there is a significant relationship between the liking rates of the advertisements and the emotional changes of the participants. According to the data obtained, there is a positive, linear, and weak relationship between the liking scores and the GSR values of the participants who said they liked the first advertisement. Therefore, as the liking of the sad-themed Vodafone commercial increases, the GSR value, which indicates emotional change, also increases. In other words, those who liked the Vodafone commercial had significantly higher Galvanic Skin Response. However, this relationship was not observed for the second advertisement, the humor-themed Profilo commercial.

Table 7. Relationship Between Data Conductivity Values (GSR) and Advertisement Liking

GSR Value		Advertisement Liking Score
Vodafone	Pearson Correlation	.356*
	Correlation	.039
	N	34
Profilo	Pearson Correlation	.185
	Correlation	.295
	N	34

*Correlation is significant at the 0.05 level (2-tailed).

Table 8 presents the t-Test comparing the GSR values of participants with their gender. There is no statistically significant difference between the GSR values of participants and their gender.

Table 8. t-Test Comparing Skin Conductivity Values (GSR) with Gender

GSR Value	Gender	N	Mean	Standard Deviation	Significance
Vodafone	Female	14	.4064	.13981	.767
	Male	20	.3930	.12092	.733
Profilo	Female	14	.4171	.13680	.843
	Male	20	.4265	.13307	.844

Table 9 presents the relationship between participants' marital status and the GSR values obtained from the study. According to the t-test results, there is no significant relationship between participants' marital status and GSR values.

Table 9. t-Test Comparing Skin Conductivity Values (GSR) with Marital Status

GSR Value	Gender	N	Mean	Standard Deviation	Significance
Vodafone	Married	8	.4288	.12308	
	Single	26	.3892	.12909	.450
Profilo	Married	8	.4013	.07864	
	Single	26	.4292	.14593	.609

Table 10 presents the GSR values obtained while participants were watching advertisements in relation to their ages. According to the t-test results, there is no significant relationship between participants' ages and GSR scores.

Table 10. t-Test Comparing Skin Conductivity Values (GSR) with Age

GSR Value	Gender	N	Mean	Standard Deviation	Significance
Vodafone	10-20	4	.4050	.06245	
	21-30	19	.3774	.14757	
	31-40	7	.4329	.12803	
	41-50	4	.4325	.05737	.739
Profilo	10-20	4	.4300	.12403	
	21-30	19	.4316	.03072	
	31-40	7	.4100	.03000	
	41-50	4	.3950	.04941	.958

5. CONCLUSION

Recent studies have shown that the emotional factor is significant in consumers' purchasing processes. Therefore, companies have started to use emotional elements more frequently in their advertisements (Mishra & Patil, 2023). The increase in the use of emotions as an advertising strategy makes it necessary to research this topic. This study compares two different types of emotional

advertisements, namely sadness and humor. According to the results obtained, while participants remembered which companies the advertisements belonged to, they largely could not recall the slogans within the advertisements. One possible explanation for this finding can be drawn from theoretical frameworks on memory and attention. According to Craik and Lockhart's (1972) Levels of Processing Theory, emotional engagement does not necessarily guarantee deep semantic encoding of verbal elements such as slogans. Emotional stimuli tend to capture attentional resources at a surface level, often at the expense of detailed cognitive processing required for long-term memory retention. In this study, the significant drop in attention levels observed during the "packshot" section—where slogans were presented—supports this interpretation. As also suggested by Nummenmaa et al. (2014), high emotional arousal can modulate attentional allocation, potentially diverting cognitive resources away from detailed verbal information processing. Therefore, while emotional narratives enhance affective engagement, the successful encoding of core messages like slogans requires a strategic integration that maintains cognitive focus at critical moments.

For both studies, the statement that participants agreed with the most was "I liked the first advertisement I watched." The statement they agreed with the least was "I will gather more information about the product/service I saw in the first advertisement." This indicates that while consumers liked the advertisements, it does not necessarily mean they will specifically research the products later.

According to eye-tracking data, the attention values of both advertisements were the same. Additionally, 87% of the Vodafone advertisement and 82% of the Profilo advertisement were actively watched. The eye-tracking values for other metrics were also very close to each other. Based on the results obtained, both advertisements were followed with almost the same level of interest. From this perspective, advertisements containing elements of sadness and humor did not have a superiority over each other.

When looking at the attention graph throughout the advertisement, participants watched the Vodafone commercial without dropping into negative (-) values for a long time, but their attention values significantly decreased towards the end of the ad. In the Profilo commercial, consumer interest was low at the beginning and end but higher in the middle sections. Therefore, the "Packshot" section, which contains the main message at the end of both advertisements, was ineffective. The reason participants could not recall the advertisement slogans in the recall questions might be due to the low interest shown in this section.

The most frequently viewed segments included the emotionally intense moment in the Vodafone commercial where the actor looks at his students after opening the door and the humorous scene in the Profilo advertisement featuring sausages being cooked in a toaster. In the Vodafone commercial, the interest level reached 1.00, while in the Profilo commercial, it remained at 0.71. In the Vodafone commercial, participants watched some scenes with very high interest due to the high emotional

intensity, but their interest decreased in other scenes. Participants generally followed the Profilo commercial, which displayed comedic elements throughout, with moderate attention that was not very high. In the Vodafone commercial, participants showed expressions of happiness in the final part where the narrative developed positively and warm emotional messages were given instead of sad elements, whereas in the Profilo commercial, this expression was used more frequently. This result can be attributed to the humorous elements in the Profilo commercial.

Looking at the Galvanic Skin Response (GSR) values of the study, it was observed that the Profilo commercial caused slightly more emotional change. However, it should be noted that the specific emotion causing this change (e.g., happiness, sadness, anger, surprise, disgust, fear) is not known. This variation does not differ based on gender, age, or marital status. No relationship was found between the recall rates of the advertisements and the GSR values. However, a significant relationship was found between the liking rates of the advertisements and the GSR values. Specifically, there was a positive, weak relationship between liking the Vodafone commercial and the GSR values. This means that individuals who experienced more emotional change while watching the commercial tended to like it more. No such relationship was established for the other commercial. Therefore, it is understood that individuals who were more affected by the sad/emotional elements in the Vodafone commercial liked the advertisement more.

In our study, to minimize the influence of cultural factors and maintain demographic consistency, participants were selected from a single district and comprised individuals with similar socio-cultural backgrounds. The fact that most of the sample falls within a similar age range (21-30 years, 55.9%) and educational level (bachelor's degree, 61.8%) limits the variability in the perception of humor and sadness themes that may arise from cultural differences. Additionally, the study environment and data collection process were standardized, thereby minimizing the impact of inter-individual cultural differences. While it is acknowledged that emotional responses to humor and sadness may vary depending on cultural context, this study focuses on individuals who share common social norms, consume similar media content, and possess a shared cultural background. In this regard, the sampling strategy employed in the research largely controls for cultural factors, enhancing the internal validity of the findings. However, it should also be noted that a more comprehensive examination of cultural factors would require a large-scale study encompassing individuals from different regions and diverse demographic characteristics.

When compared to previous studies in the literature, this study has yielded similar findings. In particular, the results align with prior research indicating that emotional advertisements have a strong impact on consumers (Dökeroğlu & Gökçearslan, 2020; Yang, 2022). Participants expressed their appreciation for both humorous and sad-themed advertisements, which supports the existing literature suggesting that emotional advertisements foster positive consumer attitudes (Kemp et al., 2013; Pirus & Zulqahar, 2018). Specifically, the fact that the humorous advertisement received a higher rating

confirms the argument put forth by Tekeli (2017) and Hoang (2013) that humor enhances attention and memorability. However, when examining the effect of emotional advertisements on purchase intention, it is noteworthy that although participants liked the advertisements, they assigned relatively moderate scores to their purchase intentions. This finding suggests that while humor and sadness can capture consumer interest, they may not necessarily be sufficient to influence purchasing behavior.

Furthermore, the literature indicates a significant relationship between emotional elements in advertisements and advertisement recall (Toker & Sulak, 2020). However, in this study, while participants could recall the brands featured in the advertisements, they had difficulty remembering the slogans. This finding is particularly noteworthy, as it suggests that although humorous and sad-themed advertisements generate emotional engagement, they may not always be effective in facilitating detailed information recall. Thus, this result highlights that, in addition to the emotional impact of advertisements, the extent to which the message is cognitively processed plays a crucial role in recall.

The eye-tracking and Galvanic Skin Response (GSR) measurements used in this study provide valuable insights into the physiological responses of consumers to advertisements. According to GSR data, the humorous advertisement elicited a higher level of arousal. This finding is consistent with Kreibig (2010), who suggested that emotional intensity leads to physiological changes. However, no significant correlation was found between GSR measurements and advertisement recall. This contradicts previous research suggesting that emotional responses are directly associated with message retention in memory (Dinç, 2018).

On the other hand, eye-tracking data indicate that participants exhibited similar levels of attention to both advertisements. However, the humorous advertisement had a longer average viewing time and received more revisit fixations. This suggests that humor attracts more attention and prompts viewers to refocus on different points within the advertisement. This finding supports the argument by McLeod et al. (2022) that humor enhances audience engagement and increases the overall effectiveness of an advertisement.

Based on the results obtained from the study, the following recommendations can be made to firms related to the subject:

The Packshot section, which is the final part of the advertisement, needs to be designed more effectively. Participants' attention decreases during this section. Since the message and slogan of the advertisement are presented in this part, companies and advertising agencies should pay special attention to this area.

Emotional advertisements are understood to have a positive impact on consumers. However, this does not mean that consumers will later want to gather more information about the product. Advertisements need to be more engaging in this regard.

Delivering emotional content only in a specific part of the advertisement while focusing on different messages in other parts reduces the effectiveness of the advertisement. It is necessary to create a narrative that can keep the participants' interest alive throughout the advertisement.

If the advertisement slogan is not correctly and effectively placed within the advertisement, participants may not remember it. This could reduce the desired impact of the advertisement on people.

By adopting a strategic approach and creating an appropriate communication language, using methods like neuromarketing, emotional advertisements can help firms establish a close relationship with their target audience and create an emotional bond with consumers.

This study has some limitations. Firstly, the study was conducted on a narrow sample. The study can be repeated with a larger sample and different demographic characteristics of consumers. Additionally, neuromarketing devices like EEG and fMRI can be used. Qualitative research methods, such as interviews, can be included in the research. Both quantitative and qualitative analyses can be conducted. The effects of emotional advertisements on consumers can be measured through promotional methods such as posters and banners.

Ethics committee approval for the study was obtained from the Afyon Kocatepe University Ethics Committee on June 26, 2024, with document number 27.06.2024-277980.

The authors declare that the study was conducted in accordance with research and publication ethics.

The authors confirm that no part of the study was generated, either wholly or in part, using Artificial Intelligence (AI) tools.

The authors declare that there are no financial conflicts of interest involving any institution, organization, or individual associated with this article. Additionally, there are no conflicts of interest among the authors.

The authors declare that they contributed equally all processes of research.

REFERENCES

Agarwal, D., & Nath, S. (2023). What's real and what's fake: A study on the use of deep fake technology in advertising. *Management Journal for Advanced Research*, *3*(1), 15-20. https://doi.org/10.54741/mjar.3.1.3

Agwu, E (2022). Strategic importance of humorous advertisement on consumer purchase decisions. *International Journal of Innovation in the Digital Economy*, *13*(1), *1-18.* https://doi.org/10.4018/IJIDE.292492

Akbar, T. A., & El-Gohary, H. (2021). *Brand humour advertisements on a social network platform and their impact on online consumer engagement: The case of Instagram in GCC countries*. In Research Anthology on Social Media Advertising and Building Consumer Relationships. IGI Global. https://doi.org/ 10.13140/RG.2.2.24081.76648

Aksoy, S. (2015). *A critical analysis of the use of humor in television advertisements* [Unpublished doctoral dissertation]. Akdeniz University.

Albert, W., & Tullis, T. S. (2023). *Measuring the user experience: Collecting, analyzing, and presenting UX metrics* (3rd ed.). Morgan Kaufmann.

Anuar, N. N. A., & Isa, S. M. (2022). Consumer emotion – A neuromarketing research. *International Journal of Education, Psychology and Counselling (IJEPC), 7*(47), 28-34. https://doi.org/10.35631/IJEPC.747004

Anwer, A., Farooq, M., Minhas, S., & Butt, H. R. (2021). The impact of emotional advertising on consumer buying behavior for apparel products in Gujranwala. *Revista Geintec-Gestao Inovacao E Tecnologias, 11*(4), 5873-5888. https://doi.org/10.47059/revistageintec.v11i4.2642

Ateş, S. (2016). The use of emotional appeal in political advertisements: Analysis of advertisements produced by political parties in the June 7, 2015 general elections. *Karadeniz Technical University Faculty of Communication Electronic Journal, 3*(12), 85-103.

B2Press (2022, July 20). *Duygusal reklamcılık nedir ve nasıl kullanılır*? B2Press https://tr.b2press.com/kutuphane/107/duygusal-reklamcilik-nedir-ve-nasil-kullanilir

Başaran, Ü., & Yıldız, M. (2022). Analysis of the effects between advertisement engagement, attitude towards advertising, and purchase intention: The mediating role of brand attitude. *Turkey Communication Research Journal, 40*(1), 173-195. https://doi.org/10.17829/turcom.1051482

Becan, C. (2021). Sadness appeal as a social emotion in advertising: Emotion analysis of advertisements published during the pandemic. *Turkish Online Journal of Design Art and Communication, 11*(4), 1239-1262. https://doi.org/10.7456/11104100/003

Birknerová, Z., Miško, D., Ondrijová, I., & Čigarská, B. N. (2022). Analysis of consumer awareness of neuromarketing. *TEM Journal, 11*(2), 870-875. https://doi.org/10.18421/TEM112-47

Bishop, E. (2014, March 19). *Five reasons comedy belongs in advertising*. Spinsucks. https://spinsucks.com /marketing / five-reasons-comedy-belongs-in-advertising/

Bou Saada, R., Bou-Hamad, I., & Harajli, D. (2023). Influence of emotional marketing on consumer behavior towards food and beverage brands during the COVID-19 pandemic: A study from Lebanon. *Journal of Marketing Communications, 29*(8), 822-839. https://doi.org/10.1080/13527266.2022.2088600

Can, A. (2014). *Data analysis in scientific research process with SPSS*. Pegem Akademi.

Chelsea, L., Ratcliff, R., & Ye, S. (2020). Overcoming resistance through narratives: Findings from a meta-analytic review. *Human Communication Research, 46*(4), *412-443*. https://doi.org/10.1093/hcr/hqz017

Craik, F. I. M., & Lockhart, R. S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior*, 11(6), 671–684. https://doi.org/10.1016/S0022-5371(72)80001-X

Derinözlü, E. (2019). *The effect of emotional advertising appeals on brand preference in luxury brand communication and an application* [Unpublished doctoral dissertation]. Virginia University.

Dinç, E. E. (2018). *A practical research on measuring and comparing the sensory and emotional responses of the Turkish people to global and local brands using neuromarketing methods* [Unpublished doctoral dissertation]. Üsküdar University.

Dökeroğlu, O. T., & Gökçearslan, A. (2020). An evaluation of the use of humor in print advertising. *Journal of Arts, 3*(4), 313-332. https://doi.org/10.31566/arts.3.021

Edwards, S. M. (1995). *Consumers' attitudes toward advertising and purchase intentions regarding direct response advertisements in a multicultural market* [Unpublished master's dissertation]. California State University.

Eisend, M. (2009). A meta-analysis of humor in advertising. *Journal of the Academy of Marketing Science, 37*, 191-203. https://doi.org/10.1007/s11747-008-0096-y

Ekman, P., & Friesen, W. V. (1978). Facial action coding system (FACS): A technique for the measurement of facial action. *Palo Alto: Consulting Psychologists Press*.

Farnsworth, B. (2023, December 9). *10 most used eye tracking metrics and terms*. *iMotions*. Imotions. https://imotions.com/blog/learning/10-terms-metrics-eye-tracking/#1-fixations-and-gaze-points

Florence, E. S., Fleischman, D., Mulcahy, R., & Wynder, M. (2022). Message framing effects on sustainable consumer behavior: A systematic review and future research directions for social marketing. *Journal of Social Marketing, 12*(4), 623-652. https://doi.org/10.1108/JSOCM-09-2021-0221

Flynn, J. (2023, June 19). *35 + Amazing advertising statistics [2023]: Data + trends.* Zippia. https://www.zippia.com/advice/advertising-statistics/

Gartlan, D. (2023, September 12). *Emotional advertising: How brands use feelings to get people to buy*. Stevens&Tate. https://stevens-tate.com/articles/emotional-advertising/

Gasco, V. (2020, January 20). *How heatmaps and eye tracking help to optimize sales*. https://blog.saleslayer.com/how-heat-maps-eye-tracking-optimize-sales

Gumber, S. (2022). Navras: Reflections of emotions in advertising. *Journal of Visual and Performing Arts*, *3*(1), 232-243. https://doi.org/10.29121/shodhkosh.v3.i1.2022.87

Güz, H., & Atkan, B. (2021). Humor in television advertisements: Semiotic analysis. *Kastamonu Communication Research Journal,* (7), 27-47.

Hashem, T. N., Ali N. N., & Allan, M. (2020). Influence of emotional marketing on brand loyalty among females in the field of cosmetics: Mediating role of customer satisfaction. *International Journal of Management, 11*(9), 1245-1260.

He, M., & Li, A. (2016). The impact of sad-spending on emotional recovery process. *Psychology, 7*(1), 85-91. https://doi.org/10.4236/psych.2016.71010

Hjortsjö, C. H. (1969). *Man's Face and Mimic Language*. Lund: Studentlitteratur. https://diglib.uibk.ac.at/download/pdf/782346.pdf

Hoang, A. T. (2013). *Impact of humor in advertising on consumer purchase decision* [Unpublished master's thesis] Saimaa University.

Ihsan, R. K., & Junaidi, F. (2022). A content analysis of advertising appeal in free to play mobile game ads. *Symposium of Literature Culture and Communication (SYLECTION) 2023, 1*(1), 28. https://doi.org/10.12928/sylection.v1i1.11277

Jeon, Y. A., Ryoo, Y., & Yoon, H. J. (2024). Increasing the efficacy of emotional appeal ads on online video-watching platforms: The effects of goals and emotional approach tendency on ad-skipping behavior. *Journal of Advertising, 53*(1), 1-18. https://doi.org/10.1080/00913367.2022.2073299

Josephs, O., Turner, R., & Friston, K. (1997). Event-related f MRI. *Human Brain Mapping, 5*(4), 243-248. https://doi.org/10.1002/(SICI)1097-0193(1997)5:4<243::AID-HBM7>3.0.CO;2-3

Kamran, Q., & Siddiqui, D. A. (2019). The impact of emotional advertising on consumer buying behavior for home appliance products in Pakistan. *Business and Management Horizons, 7*(1), 23-48. https://doi.org/10.5296/bmh.v7i1.14410

Kang, I. H., Leliveld, M. C., & Ferraro, R. (2022). The impact of facial emotional expression on the effectiveness of charitable advertisements: The role of sympathy and manipulative intent. *Journal of Behavioral Decision Making, 35*(5), e2281. https://doi.org/10.1002/bdm.2281

Kasilingam, D., & Ajitha, S. (2022). Storytelling in advertisements: Understanding the effect of humor and drama on the attitude toward brands. *Journal of Brand Management*, *29*(4), 341-362. https://doi.org/10.1057/s41262-021-00253-7

Ke, F., Liu, R., Sokolikj, Z., Dahlstrom-Hakki, I., & Israel, M. (2024). Using eye-tracking in education: Review of empirical research and technology. *Educational Technology Research and Development, 72*, 1383–1418. https://doi.org/10.1007/s11423-024-10342-4

Kemp, E., Chapa, S., & Kopp, S. W. (2013). Regulating emotions in advertising: Examining the effects of sadness and anxiety on hedonic product advertisements. *Journal of Current Issues & Research in Advertising, 34*(1), 135-150. https://doi.org/10.1080/10641734.2013.754719

Kewlani, D., Gulabwani, G., & Purohit, K. (2022). Impact of humor in advertising on consumer purchasing decisions. *International Journal of Management Public Policy and Research, 1*(1), 15-28. https://doi.org/10.55829/ijmpr.v1i1.13

Koşar, A., & Tor Kadıoğlu, C. (2020). *Türkiye'de nöropazarlama alanındaki lisansüstü tezlerin içerik analizi yöntemiyle incelenmesi*. İksad Yayınevi.

Kreibig, S. D. (2010). Autonomic nervous system activity in emotion: A review. *Biological Psychology, 84*(3), 394-421. https://doi.org/10.1016/j.biopsycho.2010.03.010

Kylila, A., & Elgeka, H. W. S. (2024). The dynamic of decision-making: Effect of intertemporal choice on clothing products. *Humanitas: Indonesian Psychological Journal, 21*(1), 26–39. https://doi.org/10.26555/humanitas.v21i1.387

Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel Psychology*, 28(4), 563-575.

Lewandowska, B. (2023). *What is AOI?* RealEye. https://support.realeye.io/what-is-aoi

Lewinski, P., Trzaskowski, R., & Sorokowski, P. (2017). Automated facial coding: Validation of basic emotions classifications in practical applications. *Frontiers in Psychology*, 8, 2406. https://doi.org /10.3389 / fpsyg.2017.02406

Li, S. Z., Jain, A. K., Tian, Y. L., Kanade, T., & Cohn, J. F. (2005). *Facial expression analysis*. Springer. https://doi.org/10.1007/0-387-27257-7_12

Mancini, M. (2025). *What is the Galvanic Skin Response (GSR) and how to use it in Neuromarketing.* Marco Mancini. https://mancinimarco.com/what-is-the-galvanic-skin-response-gsr-and-how-to-use-it-in-neuromarketing/

McLeod, B. T., Houghton, D. M., & Saavedra, J. L. (2022). Developing a sense of humor: Congruence between humor type and brand personality. *Journal of Marketing Development & Competitiveness*, *16*(4), 34-48. https://doi.org/10.33423/jmdc.v16i4.5751

Mishra, R., & Patil, D. Y. (2023). A study on the impact of emotional advertising in the 21st century. *CEMJP*, *31*(1), 73-89. https://doi.org/10.57030/23364890.cemj.31.1.8

Muhammad, R., Ali, A., Anwar, M. A., Soomro, T. A., AlShorman, O., Alshahrani, A., Masadeh, M., Ashraf, G. M., Ali, N. H., Irfan, M., Alexiou, A. T. (2023). Design and development of low-cost wearable electroencephalograms (EEG) headset. *Intelligent Automation & Soft Computing*, *35*(3), 2821-2835. https://doi.org/10.32604/iasc.2023.026279

Naidu, C. (2023). Impact of emotional advertising on consumer purchase buying behavior in Delhi/NCR. *International Journal of Financial Management and Economics*, 6(1), 201–205.

Nummenmaa, L., Hyönä, J., & Calvo, M. G. (2014). Eye movement assessment of selective attentional capture by emotional pictures. *Emotion*, 6(2), 257–268. https://doi.org/10.1037/1528-3542.6.2.257

O'Hara, B. J., Owen, K. B., Bauman, A. E., Dunlop, S., Phongsavan, P., Furestad, E., Nicola, S., & Freeman, B. (2023). Hope and sadness: Balancing emotions in tobacco control mass media campaigns aimed at smokers. *Health Promotion Journal of Australia*, 34(4), 856-866. https://doi.org/10.1002/hpja.683

Otamendi, F. J., & Sutil Martín, D. L. (2020). The emotional effectiveness of advertisement. *Frontiers in Psychology*, 11, 2088. https://doi.org/10.3389/fpsyg.2020.02088

Panthen, M., & Germelmann, C. C. (2023). Marketing and the commercialization of emotions. *In Marketing and the Commercialization of Emotions*. De Gruyter Brill. https://doi.org/ 10.30965 /9783657795795_002

Pirus, M. S. M., & Zulqahar, S. Y. (2018). The understanding of sad appeal in emotional advertisement among audiences in Klang Valley, Malaysia. *Jurnal Komunikasi: Malaysian Journal of Communication*, *34*(4), 319-336. https://doi.org/10.17576/JKMJC-2018-3404-19

Pluta-Olearnik, M., & Szulga, P. (2022). The importance of emotions in consumer purchase decisions—A neuromarketing approach. *Marketing of Scientific and Research Organizations*, *44*(2), 87-104. https://doi.org/10.2478/minib-2022-0010

Qutp, M. M., Abodonia, S. H., & El Sharkawy, A. Z. (2022). The emotional communication effectiveness of advertising on consumer behavior. *International Design Journal*, *12*(6), 271-280. https://doi.org/10.21608/idj.2022.267603

RealEye (2024). *RealEye accuracy on computers.* RealEye. https://support.realeye.io/realeye-accuracy?utm_source=chatgpt.com

Satapathy, C., Gokhale, H., Syed, A. Z., & Nersisson, R. (2024). Galvanic skin response based stress level detection using supervised machine learning approach. In AIP Conference Proceedings (Vol. 2966, No. 1). AIP Publishing.

Septianto, F. (2021). Anxiety, sadness, and emotion specificity: The role of music in consumer emotion and advertisement evaluation. *ASEAN Marketing Journal*, *5*(2). https://scholarhub.ui.ac.id/amj/vol5/iss2/2/

Şenduran, F. (2019). The use of eye-tracking system (Eye Tracker) in sports science: A guide for new researchers. Ankara University Faculty of Sports Sciences SPORMETRE *Journal of Physical Education and Sports Sciences*, *17*(4), 1-13. https://doi.org/10.33689/spormetre.528980

Solak, B. B. (2017). *Using humor and humorous characters in Tv Ads: Analysis on bank commercials.* [Unpublished master's thesis]. Akdeniz University.

Soti, R. (2022). The impact of advertising on consumer behavior. *World Journal of Advanced Research and Reviews, 14*(3), 706-711. https://doi.org/10.30574/wjarr.2022.14.3.0577

Statista. (2024). *Global advertising spending from 2000 to 2024*. Statista. https://www.statista.com/statistics/236943/global-advertising-spending/

Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics (6th ed.)*. Pearson.

Tekeli, Y., (2017). *The role of humor as an advertising appeal in the consumer purchasing decision process*. [Unpublished doctoral dissertation]. Marmara University.

Toker, A., & Sulak, H. (2020). A study on the types of appeals used in commercial advertisements and their effects on consumers. *Suleyman Demirel University Visionary Journal, 11*(Special Issue), 117-133. https://doi.org/10.21076/vizyoner.727107

Weber, I. (2024). *Eleven effective emotional advertising examples brands are using.* Creatopy. https://www.creatopy.com/blog/emotional-advertising-examples/?utm_source=chatgpt.com

Wedel, M., & Pieters, R. (2008). Eye tracking for visual marketing. *Foundations and Trends in Marketing*, 1(4), 231-320. http://dx.doi.org/10.1561/1700000011

Xavier, L. (2023, May 15). *Beyond logic. How emotions drive our buying decisions.* Linkedin. https://www.linkedin.com/pulse/beyond-logic-how-emotions-drive-our-buying-decisions-ludymilla-xavier/

Yang, Q. (2022). *How sadness in narrative advertising influences brand attitude and purchase intention of audiences* [Unpublished doctoral dissertation]. The University of Texas at Austin.

Yiğit, M. G. (2020). *The role of dissociation and rumination in the formation of intrusive memories* [Unpublished doctoral dissertation]. Ankara University.

Yıldız D, & Uzunsakal E. (2018). Comparison of reliability tests in field research and an application on agricultural data. *Applied Social Sciences Journal. 2*(1), 14-28.

Yıldız, S., & Uztuğ, F. (2017). The effects of absurdity in advertising on attitude and recall towards the advertisement. *Karadeniz Technical University E-Journal of Faculty of Communication. 7*(1), 96-117.