

EYE-TRACKING IN ADVERTISING RESEARCH: AN INVESTIGATION AMONG GENERATION Z AND Y OF SHOCK TACTICS' EFFECTIVENESS

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Abstract: Advertising has become an integral part of everyday life, due to the abundance of advertising messages, it is virtually impossible to pay attention or to retain all of them; thus, consumers learn to ignore most advertisements they are exposed to. Striving for exceptionalism and persuasion, advertisers tend to use dramatic emotions, they create messages that would shock consumers, and they increasingly break social and moral norms, so that their advertising messages break through the traditional advertising clutter and reach the existing or potential customer. Since the 1980s, shock advertising has gained interest among advertising industry specialists and academics. However, the impact of shock advertising on consumer behavior can vary and its effectiveness is questionable. This article aims to analyze the differences in the reactions among generations Z and Y to shock advertising, using the eye tracking method. A total of 40 participants were invited to take part in the study. The core of the research was based on seven distinct types of shock tactics. Each of these groups represented a category of advertising posters. Within each group, there were 3-5 individual images, each varying in design, content, and nature. This variety ensured a comprehensive understanding of participants' reactions to different types of advertisements within the same category. After the data analysis, it was concluded that there are differences in the perception of different types of shock depending on the generation. The results indicate that generation Z is more tolerant of shock tactics, having a more positive reaction than generation Y. The younger age group (16-20 years) appears to engage with visual stimuli in a more dynamic and perhaps exploratory manner. They seem to have a more focused or selective attention, especially when the content is emotionally or ethically charged. This paper provides marketers with a better understanding of the effectiveness of shock advertising based on age variable, recommending alternative methods to capture the attention of consumers.

Keywords: shock tactics in advertising, eye tracking research, consumer behavior, generation theory

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Introduction

The role of advertising is to create a connection between the company and the target audience by presenting the benefits of its products or services and promoting a positive brand image. Advertising has become an integral part of everyday life, but in a modern world an average person may be exposed to more than 3000 advertising messages

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every day. Thus, over time, consumers learn to ignore them and remember only 11% of daily advertisements (Trott, 2013).

Advertising can appeal to the rational side of consumers, it can convey information and cause cognitive reactions, however most interesting is the emotional aspect of advertising that affects the feelings of the audience. Striving for exclusivity and persuasion, advertisers tend to use dramatic emotions, they create messages that would shock consumers, so that their advertising messages would ripple through the contemporary advertising clutter and reach the potential customer. Shocking advertising is created to emotionally affect and stir thinking, to touch people, at a fundamental level, and encourage them to act. Shocking advertising is a conscious attempt to shock the consumer by violating society's social, cultural, moral, and religious values. Critics of shock tactics in advertising accuse the creators of shocking ads of emotional manipulation and social issue trading, while their advocates analyze the factors that cause shock in advertising and seek to determine how they positively affect the emotions and behavior of the audience. It is argued that shock tactics are used to make people stop and notice an advertisement. However, there is no unanimous opinion among experts in the field on this topic of research, despite over forty years of continuous discussion, the impact of shock advertising on consumers remains a relevant object of scientific research. Studies related to the impact of shock advertising on consumer emotions and behavior reveal that the nature and intensity of consumer reaction is determined by demographic and socio-cultural factors of the target segments, as well as by different advertising contexts. Age factor has a significant impact on the perception of shock ads. This factor can significantly differentiate how people interpret and respond to provocative or controversial elements in an ad. The aim of this article is to conduct a comparative analysis of the impact of shock advertising on generation Z and Y using neuromarketing method of research – eye tracking. In order to achieve the stated objective the author formulated the following research hypotheses:

1. Demographic factors such as age and gender of the audience influence the effectiveness of shock ads.
2. Generation Y and perceive shock advertising as more offensive than younger youth from generation Z.
3. Generation Y and Z have different reactions to various shock tactics in advertising.

1. Literature review

Since the 1980s, shock advertising has gained interest among both advertising industry specialists and academics. Shock advertising, also known as shockvertising, is a marketing or advertising strategy that aims to provoke a strong and often emotional response from the audience through the use of provocative, controversial, or shocking content. This strategy typically goes beyond the boundaries of what is considered normal or expected in advertising and relies on elements designed to elicit surprise, disbelief, or even discomfort. When discussing such a type of advertising, a term is particularly common in practice - shock advertising. However, a review of the scientific literature reveals that marketing theorists and practitioners use different terms to define shock ads. Other terms with the same

semantic meaning that are mentioned in the literature by researchers are: irritating, non-traditional, offensive, taboo, provocative, shocking and controversial.

Shock advertising is advertising that conflicts with established expectations, norms and behaviors (Stiensmeier and Pelster). Dahl (2003), one of the most cited authors on shock advertising, defined it as "a deliberate attempt to surprise an audience and thereby violate societal norms and values and personal ideals in order to capture the attention of a target audience". [Darren, 2018, p.269]

Offensive advertising is commonly viewed as advertising that intentionally, rather than unintentionally, horrifies and upsets viewers (Gustaeson and Yssel, 2003). Venkat and Abi-Hanna (2003) defined it as one that calculatedly offends its audience. Authors Gerard Prendergast, Wah-Leung Cheung and Douglas West use the concept of offensive advertising to refer to 2 types of advertising: that which promotes products that may offend and that which uses offensive ways of promoting products (2008).

Controversial advertising has been described as "an advertisement that suddenly captures the viewer's attention by creating a buzz (effect of controversial discussion), violating moral or social norms, traditions and customs" (Skorupa, 2014).

Pflaumbaum conceptualized shock advertising as one that challenges various taboos in order to surprise the target audience and create negative reaction. Javed and Zeb referred to definitions by Dahl and others, but proposed their own definition of "shockvertising" stating that it is advertising that suddenly grabs the attention of the audience and creates the resonance or buzz marketing effect and may go against social norms, customs, traditions or cultural values (Tiwari, 2019).

Nigel K. LI. Pope, Kevin E. Voges and Mark R. Brown (2019) have referred to shock advertising using the term provocative advertising, which they define as characterized by an intentional attempt to gain attention through shock and which operates through three characteristics: distinctiveness, ambiguity, and violation of social norms and cultural taboos. Parry (2013) noted that shock advertising includes terms and formulations such as "advertising provocation", "violent advertising" (Andersson, 2004), "advertising taboo" (Sabri and Obermiller, 2012)., "offensive advertising" (Waller, 2005) and "sexually referenced advertising" (Sengupta and Dahl, 2008).

From the concepts analysed in the literature it can be concluded that not all the terms used in the description of shock advertising are absolutely identical, however many common aspects and characteristics are found, among them are: violation of social and moral norms, creation of surprise effect to cause the highest level of shock. The message used is ambiguous and confusing, leading to group discussions and creating a buzz to attract greater attention among the general public. Another common element mentioned in these notions is - provoking negative emotions among consumers, which occurs as a result of violating ethical and moral norms in society. The negative reaction of consumers to shock advertising may be partly due to the fact that no one gives the reason or explanation why the shock tactic is used, which creates confusion and greater interest. (Figure 1.)

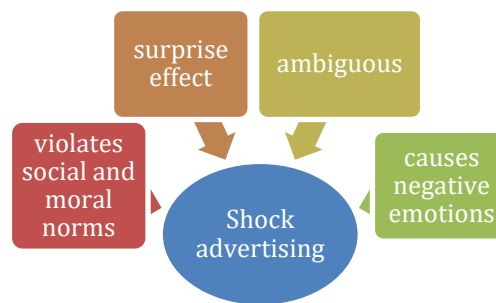


Figure 1. Common characteristics of terms referring to shock advertising

Source: developed by author based on literature review

Based on the relevant literature review, the author offers the following definition: 'shock' advertising is a form of advertising that is designed to create a strong emotional impact on the audience by intentionally and unexpectedly violating social and moral norms, values and norms in order to attract people's attention, to differentiate among competitors, to achieve a higher level of message recall, as well as to persuade them to perform an action.

For the national context, shock advertising is a new, less studied field, but one that is attracting increasing attention from both theorists and practitioners in the field who are looking for innovative methods of communication. The importance of studying shock advertising is argued by the need to understand what reactions it can provoke among consumers, how it could help companies create a competitive advantage, and what are the benefits and risks of using shock tactics in different advertising contexts. Studies have focused on defining the elements and features of shock advertising, with the common emphasis that it must break social norms in a way that are intentional and unexpected by consumers. Researchers have demonstrated that shock advertising can be a much more effective means of attracting consumer attention and memorizing the message compared to traditional promotional methods, it has been observed that culture, beliefs, personal values of an individual are factors that could influence responses to shock ads and perceived offensiveness (Fam et al., 2004). For example, religious consumers may be more easily offended by the nature of shock advertising than non-religious consumers, especially if the advertisement uses religious taboos to promote the brand (Nooh et al., 2014). Demographic factors such as age and gender of the audience also influence the effectiveness of shock ads, with women being more likely to be offended (Lee et al., 2020), younger generations have a higher tolerance for shock levels compared to people who are Generation Y (Urwin et al., 2014), and people aged 22+ perceive shock ads as more offensive than younger youth (Waller et al.2013). Existing research on shock advertising focuses mainly on products and services that are offensive to consumers, such as cigarettes, alcohol, condoms, sexually transmitted diseases, and pharmaceuticals (Chan et al., 2007), less studied is the impact of various types of shock on consumer behavior. There are divergent and conflicting views on the factors that would influence consumer reactions in various contexts and the effectiveness of shock ads in the commercial and social communication (Parry et al., 2013). In the literature, more attention is paid to the analysis of the immediate impact of shock tactics in advertising and less to the sustainability or long-term impact of this communication

strategy. In addition, previous studies have described the components of shock advertising in isolation, and fewer have investigated the phenomenon in a context-dependent environment (Christy and Haley, 2008).

Studying the impact of shock advertising on consumers is important for several reasons:

- *Ethics and responsibility in advertising*: Shock ads can have a powerful impact on consumers, influencing their attitudes, behaviors and purchasing decisions. It is important to assess the extent to which these advertising campaigns comply with ethical principles and whether they violate any social norms to ensure that the emotions and vulnerabilities of the public are not exploited or manipulated.
- *Emotional and psychological effects*: Shock ads can provoke intense emotional reactions such as shock, anxiety, sadness, or anger. By studying these effects, one can better understand how consumers react to such messages and images, and how they can affect their psychological and emotional state, and the opinion created towards the company and the object of promotion.
- *Influencing buying behavior*: Shock ads can influence consumers' purchasing decisions by creating a strong and memorable impression of a product or brand. By studying the impact of shock ads, it would be possible to assess how effective these strategies are in generating sales and brand loyalty.
- *Corporate image and brand reputation*: Shock campaigns can have immediate effects on a brand's corporate image and reputation. Studying these impacts can help companies understand how to manage and respond to possible negative reactions or criticism from the public.
- *Regulation and legislation*: Studying the impact of shock advertising can influence the development and implementation of advertising regulation and legislation, ensuring a balanced approach between creativity and freedom of expression and protecting consumer interests and welfare.
- *Raising attention and creating awareness*: Shock ads have the potential to differentiate themselves from other common advertising campaigns. By using provocative or unexpected elements, they can quickly grab the attention of the audience and make the product or brand easier to remember.
- *Generating discussion and audience interest*: Shock ads can spark intense discussion among the audience, and this can be an effective strategy to generate interest and curiosity around the product or brand being promoted. Thus, the campaign can benefit from increased exposure through media and social media.
- *Increased audience engagement and interaction*: Shock ads can lead audiences to interact more with the campaign, share content on social media or provide feedback. This increased engagement can help build a closer relationship between consumers and the brand.
- *Promote the social cause or message*: Some social marketing campaigns are designed to draw attention to important social causes or messages. By presenting

controversial or provocative themes, these campaigns can raise public interest in social or environmental issues.

- *Establishing a strong market position:* Shock ads can be useful in an intensely competitive environment where it is difficult to make a strong impression. By using unconventional messages or images, the brand can demonstrate that it is innovative and bold, which can differentiate it from the competition.
- *Evolution and innovation in advertising:* By studying the impact of shock advertising, one can better understand trends and changes in advertising and how messages and strategies adapt to new consumer demands and expectations.

It is important to note that the use of shock advertising comes with risks. It can be perceived negatively by certain consumer groups and can damage brand reputation in unexpected ways. Before adopting such a strategy, companies should do extensive research and consider the values and preferences of their target audience. Ethics and responsibility in advertising should also be considered to avoid the use of shocking messages or images that could be offensive or harmful to certain segments of the public.

Marketers have different approaches to the shock cases evoked in advertising and what would be the key element causing the shock. Wilson and West, Katsanis, Fahy(2018) argue that the audience might be shocked primarily by the advertising content itself. On the other hand, Percy, Albers-Miller and Stafford, Nadein and Petrova (2014) argue that the shock reaction could be caused by the shock tactics used in advertising which through various emotional appeals would create a shocking way in which advertising is presented. (Figure 2).

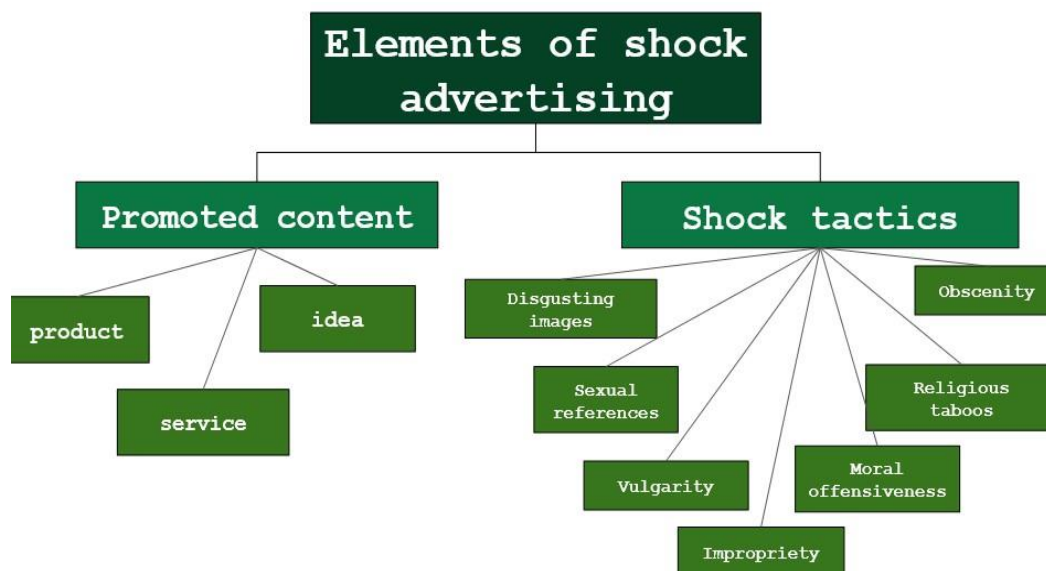


Figure 2. Elements of shock advertising

Source: developed by author based on Dahl et al, p.270

In a study based on the analysis of television commercials, Barnes and Dotson (2014) specified that the consumer's rejection reaction could be caused by the product being promoted and the emotional appeals that are used. Empirical research indicates that these features encourage cognitive processes that produce strong effects on memory, the

authors hypothesize that shocking advertising content, because it attracts attention and provokes cognitive processing, is more likely to influence appropriate behavior.

When evaluating offensive television advertising, Barnes and Dotson (2014) identified the following products that can generate shock reactions: condoms, feminine hygiene products, men's and women's underwear. Phau and Prendergast (2014) singled out cigarettes, alcohol, condoms, female contraceptives, feminine hygiene products as controversial. Waller (2005) presents a list of 15 products and groups them by their level of consumer offense (from least to most offensive): alcohol, cigarettes, condoms, female contraceptives, feminine hygiene products, women's underwear, funeral services, gambling, men's underwear, pharmaceuticals, political parties, racial extremist political groups, religious cultures, sexually transmitted diseases, and weight loss programs.

A more in-depth analysis of the emotions triggered by shock advertising was carried out by Dahl et al. (2003) who identified seven types of shock tactics or "shock appeals"): disgusting images, sexual references, profanity or obscenity, vulgarity, indecency (ethical rudeness), moral offences, religious taboos. The typology of shock tactics according to Dahl (2003) is described in Table 1.

The review of the scientific literature shows that active discussion of the purpose of shock advertising and its impact on consumer behaviour has attracted the attention of many researchers and is still relevant today. It is argued that shock tactics are used to make people stop and notice an advertisement. Researcher Williams (2007) agrees with this and states that shock is an effective means to capture attention and a quick way to communicate a message for any organization. In his studies Fendley (2003) notes that shock advertising attracts media interest and the company's name appears in the public eye. Meanwhile Dahl (2003) predicts that shock messages are used to draw attention to an advertisement in the hope of not only notice but also further elaboration of the issue.

The impact of shock tactics depends on demographic, socio-cultural factors and advertising context. One of the most important factor is age: Liu's studies show that there are differences in the perception of shock ads among consumers of different ages, usually younger consumers have a more positive view for the use of shock tactics than older people. This was confirmed by Hwa and Prendergast (2007), by concluding that people who were over 40 years old were more likely to refuse to buy products in shocking advertisements compared to younger people. Barry and Brugiere (2007) pointed out that the younger consumer segment may have a more positive attitude towards offensive advertisements and will not have a negative attitude towards buying the product.

Since the early 1970s, marketing researchers have observed that younger generations have different preferences, values and behaviours and react differently to company marketing efforts. So in 1971 they began researching and monitoring consumer behaviour in the US using a specific method - Yankelovich MONITOR. It was the first and most comprehensive study of Americans' lifestyles, buying behavior, and moral values. This innovative method has been used longitudinally from year to year, thus over twenty-five years an analysis of prospective social trends has been conducted. The system made

analyses of the similarities and differences between the behaviour of different generations. Thus emerged Wiliam Strauss and Neil Howe's theory of generations, deviding in five distinctive generations (Table 2).

Table 1. Classification of shock tactics in advertising according to Dahl et al.

Shock tactics/Offending element	Description	Examples
Disgusting images	Use of images of blood, body parts or secretions, orifices, especially urinary/fecal, gases, diseases, parasites, injuries, death.	<i>Social advertisements:</i> images of lung and mouth cancer on cigarette packets.
Sexual references	Images or references to sexual relations, full or partial nudity.	<i>Commercial advertising:</i> Dolce Gabbana, Opium perfume, Calvin Klein.
Profanity / obscenity	Swearing, obscene gestures, racial epitaphs.	<i>Social ads:</i> Smoking turns you into a slave (France), the importance of using condoms (Health Canada). <i>Commercials:</i> British clothing brand French Connection using FCUK brand abbreviation, Benetton - image of an African-American woman breastfeeding a white baby.
Vulgarity	References to cruelty or bad taste, actions of humans or animals, such as such as nose picking, humping or drinking from the toilet.	<i>Social advertisements:</i> the Bernardos organisation used an image of a child with a beetle instead of a spoon to collect donations.
Indecency	Violations of social values or breaches of decency and ethical norms e.g. dress, manners.	<i>Commercial ads:</i> Sisley with the image of shopping addiction, Darwin company with the advertising "Those Days", Covoare.md company.
Moral offence	Harminginnocent people/animals,violence, alluding to persons or objects causing violence (e.g. Hitler), violation of standards of correct behaviour (e.g.shooting a person in the back), placing children in provocative situations (e.g. sexual, violent or exploitation of victims).	<i>Social advertisements:</i> Humans for Animals, with the image of a seal killing a baby, Concordia with advertising to collect donations to help poor children, with the image of children suckling from a pig.
Religious taboos	Improper use of spiritual words or religious symbols and/or rituals.	<i>Commercial:</i> Benetton company with a priest and a mother kissing, Ice cream maker Antonio Frederici with the image of two kissing priests, a pregnant nun.

Source: Developed by author based on Dahl et al, p.270

Table 2. Delimitation of generations according to the theory of Wiliam Strauss and Neil Howe

Years	Generation
1940-1960	Baby boomers
1960-1980	Generation X
1980-2000	Generation Y
2000-2020	Generation Z
2020	Generation Alpha

Source: Developed by the author

Each of these generations has its own moral values, opinions and personal attitudes towards the role of family and career, life balance, private life, which they have developed under the impact of the changing social environment. There are several studies that would analyse the relationship between the impact of shock tactics in advertising and the generation of the consumer. Sarry Perry et al have analysed how consumers of different generations react to shock advertising in the profit and non-profit sectors. The results of this study showed:

- Generation X finds shock tactics in advertising more controversial than Generation Y;
- Younger generations are more open to accepting shock in advertising and do not provoke negative emotions;
- Most baby boomers got insufficient information from shock ad content, which did not influence them to make the purchase, but created more confusion for them;
- Generation X is able to tune out shock advertising and ignore it;
- Generation Y finds many shocking ads on the internet and the level of offence is lower than Generation X;
- Generations Y and Z pay less attention to shock elements in advertising than older generations;
- Violence and fear are the highest perceived shock tactics for Generation Z.

Another study that set out to explore the effectiveness of shock advertising on Gen Y behaviour was conducted by Urwin and Venter. The results of this research revealed that the majority of respondents either did not remember anything about the shock ad, or only remembered the images, so the shock did not promote recall of the message, and the images sampled the content of the ad. Consumers rated the use of sexual references as the least shocking and therefore the most ineffective compared to the other shock tactics used in the study (religious taboos, disgusting images, indecency and moral offence).

A study by Kantar Millward Brown found that Generation Z is more accepting of unconventional gender roles and diversity in advertising. The study also found that this generation is more likely to engage with and distribute ads that align with their values and beliefs. Another study published in the Journal of Consumer Marketing found that

millennials are more likely to remember and interact with ads that causes strong emotions, including shock and surprise. However, the study also noted that these emotions must be related to the product or service being promoted to be effective.

A study by the Advertising Research Foundation found that while shock advertising can be effective in attracting attention and generating buzz, it is less effective in stimulating long-term brand loyalty and buying behaviour. The study suggested that shock tactics should be used with moderation and in combination with other advertising techniques. A study by The Drum found that Generation Z is more likely to be upset by shock advertising that is seen as insensitive or offensive. Overall, these studies suggest that shock tactics in advertising can be effective in engaging both Generation Y and Generation Z, but they need to be used carefully and in combination with other advertising techniques.

2. Data and Methodology

This study is a part of a complex exploratory research on the impact of shock tactics in advertising on local consumers. The main objective of the research is to assess the impact of shock tactics in advertising on consumer behaviour, to analyse various shock tactics to determine which are perceived to have a higher level of shock and to determine how does age factor influence consumers' perception of shock advertising, based on generation Y and Z, using neuromarketing method of research – eye tracking. Eye tracking can be a valuable tool in shock advertising research for several reasons:

1. **Understanding Attention Patterns:** Shock advertising relies on its ability to grab viewers' attention. Eye tracking reveals exactly where viewers are looking, helping researchers understand which elements of a shocking advertisement are the most attention-grabbing. This information can inform the design and placement of shocking elements for maximum impact.
2. **Assessing Emotional Responses:** Shock advertising often aims to provoke strong emotional responses. Eye tracking can be used in conjunction with other physiological measurements (e.g., facial expression analysis, heart rate monitoring) to assess how viewers emotionally engage with and react to shocking content.
3. **Analyzing Visual Engagement:** Eye tracking provides data on how long viewers dwell on specific elements within a shocking ad. Researchers can determine whether viewers linger on shocking images, indicating a deeper emotional or cognitive response, or if they quickly divert their gaze, suggesting avoidance or discomfort.
4. **Comparing Impact Across Audiences:** Different viewers may react differently to shock advertising due to factors such as demographics, personality traits, or prior experiences. Eye tracking can help researchers compare how various audience segments respond to the same shocking content, enabling more targeted and effective campaigns.

5. **Optimizing Creative Elements:** Shock advertising often involves a combination of visual and textual elements. Eye tracking can help pinpoint which elements are most effective in conveying the shock value and delivering the intended message.
6. **Determining Message Recall:** Shocking advertisements aim to be memorable. Eye tracking can be used in post-exposure tests to assess how well viewers remember specific aspects of a shocking ad, including key messages, brand names, or product details.
7. **Evaluating Ethical Boundaries:** Shock advertising sometimes pushes ethical boundaries. Eye tracking research can provide insights into whether viewers perceive shocking content as offensive, exploitative, or in poor taste. This information can guide ethical decision-making in advertising.
8. **Tracking Viewer Engagement Over Time:** Long-term exposure to shocking advertising can have varying effects on viewers. Eye tracking studies conducted over multiple exposures can reveal how viewers' attention and emotional responses change over time, helping advertisers fine-tune their campaigns.
9. **Comparing Shock Tactics:** Researchers can use eye tracking to compare the impact of different shock tactics within the same campaign or across different campaigns. This allows for data-driven decisions on which tactics are most effective for achieving campaign objectives.
10. **Consumer Insights:** By understanding how viewers engage with and respond to shocking content, advertisers can gain valuable insights into consumer preferences, sensitivities, and triggers. This knowledge can inform future marketing strategies beyond shock advertising.

The specifics of the methodology are detailed below:

1. Tools and Equipment

- **Application:** The study utilized the Ogama application, a renowned software for eye-tracking analysis. Ogama offers a comprehensive suite of tools that allow for the recording and analysis of visual attention data.
- **Hardware:** The Eye Tribe tracker was the chosen hardware for this study. This device captures the gaze data by tracking the movement and position of the participant's eyes in real-time.

2. Stimuli

The core of the research was based on eight distinct groups of stimuli. Each of these groups represented a category of advertising posters. Within each group, there were 3-5 individual images, each varying in design, content, and nature. This variety ensured a comprehensive understanding of participants' reactions to different types of advertisements within the same category.

3. Participants

- A total of 40 participants were invited to take part in the study.

- The participant pool was structured to ensure diversity in terms of age and sex. This was crucial to analyze and compare the differences in visual attention patterns across different demographic groups.

4. Procedure

During each individual experiment, a systematic approach to randomization was employed to ensure unbiased results. The order in which the eight groups of stimuli were presented to the participants was shuffled for every session. Furthermore, within each group, the specific stimuli (advertising posters) were also randomized in their presentation order. This double-layered shuffling technique was crucial in eliminating any potential sequence effects or biases that could arise from the consistent order of viewing. It ensured that participants' reactions were genuine and solely based on the content of the stimuli, rather than their position or sequence in the experiment.

- Participants were seated comfortably in front of the Eye Tribe tracker.
- They were then presented with the advertising posters from each of the eight groups, one at a time. The order of the groups was randomized to prevent any order bias.
- As participants viewed each poster, the Ogama application, in conjunction with the Eye Tribe tracker, recorded their gaze patterns, fixations, saccades, and other relevant eye movement data.
- The collected data provided insights into where participants looked, for how long, and in what sequence.
- Using the Ogama application, this raw data was then processed and analyzed to derive meaningful patterns and insights, especially concerning the differences in gaze behavior across age and sex.

The methodology was designed to ensure a comprehensive understanding of how different demographic groups perceive and interact with advertising posters, providing invaluable insights for marketers and advertisers.

The analysis of the collected eye-tracking data was conducted using a combination of SPSS and Python, capitalizing on the strengths of each software.

SPSS, a widely recognized statistical software, was primarily used for its robust data management capabilities and its suite of statistical tests. Descriptive statistics were first generated to get an overview of the data distribution. Inferential statistical tests, such as ANOVA and t-tests, were then conducted to determine significant differences between groups, especially concerning age and gender.

Python, on the other hand, was employed for its flexibility in data manipulation and visualization. Utilizing libraries such as pandas for data wrangling and matplotlib and seaborn for data visualization, the eye-tracking data was further dissected to reveal patterns and insights. Custom scripts were written to automate repetitive tasks, ensuring consistency in the analysis. Moreover, heatmaps and gaze plots were generated using Python to visually represent where participants focused their attention on the advertising posters.

Together, SPSS and Python provided a comprehensive toolkit for a thorough and nuanced analysis of the eye-tracking data, ensuring both statistical rigor and detailed exploratory insights.

The definitions of the eye-tracking indicators provided by research:

1. Trial Durations (milliseconds)

This refers to the total time a participant spends viewing a particular stimulus or image, measured in milliseconds (ms). It provides an indication of how long the content held the viewer's attention. If a viewer spends 5000 ms (or 5 seconds) looking at an advertisement, it suggests that the ad might have captivated their attention for that duration.

2. Gaze Fixation Count

This is the number of times a viewer's gaze remains relatively stationary on specific areas of interest within a stimulus. Each stationary period, where the eyes are taking in information, is termed a 'fixation'. If a viewer's gaze fixation count is 10 while looking at a magazine cover, it means their eyes settled and focused on 10 different areas while viewing that cover.

3. Gaze Fixations Count Per Second

This metric divides the total gaze fixation count by the total viewing time, giving an average of how many fixations occur every second. It can indicate how rapidly a viewer is processing or scanning the content. If a viewer has a gaze fixation count of 10 over 5 seconds, the gaze fixations count per second would be 2.

4. Gaze Fixation Saccade Ratio

A saccade is a rapid movement of the eye between fixation points. The Gaze Fixation Saccade Ratio compares the number of fixations to the number of saccades. A higher ratio might suggest that viewers are making rapid eye movements, possibly indicating surprise or shock. If a viewer has 5 fixations and makes 4 rapid eye movements between them, the ratio would be 5:4 or 1.25.

5. Gaze Average Saccades Length

This measures the average distance (in terms of screen space) between consecutive fixations. It can indicate how broadly or narrowly a viewer is scanning the content. If a viewer's eyes jump a long distance across a billboard to focus on a bold headline after reading a smaller text, the saccade length for that movement would be longer than if they were just reading the smaller text line by line.

Understanding these eye-tracking indicators can provide invaluable insights into how viewers interact with content, helping researchers and marketers optimize visual materials for their target audience.

3. The Model and Findings

General Observations on 16-20 Years Age Group's Eye-Tracking Behavior:

Based on the extensive discussion and analysis of the eye-tracking data across the various groups, here's a comprehensive analysis of how the younger age group (16-20 years) perceives and reacts to the stimuli:

The younger age group tends to have varied viewing times across different groups, suggesting a more dynamic and perhaps unpredictable engagement with visual stimuli. Their gaze fixation counts are generally lower in several groups, indicating a more focused or selective attention to specific elements of the content. The Gaze Fixation Saccade Ratio and Gaze Average Saccades Length in some groups indicate that the eyes of the younger demographic might move more rapidly, possibly reflecting a more exploratory or curious nature.

Specific Insights

1. **Disgusting Images:** The younger age group had a slightly shorter viewing time, suggesting a possible aversion or quicker emotional processing of disturbing content.
2. **Religious Taboos:** Their viewing times were almost similar to the older age group, indicating a balanced or neutral stance towards religious imagery.
3. **Moral offense:** The younger group spent more time on these images, suggesting a deeper engagement or perhaps a more evaluative approach to content that challenges moral values.
4. **Sexual References:** Their gaze patterns indicate a more focused attention, possibly reflecting the curiosity or heightened interest typical of this age group.
5. **Indecency:** The younger age group spent slightly more time on these images, suggesting a deeper engagement or perhaps a more evaluative approach.
6. **Impropriety:** Their viewing times were slightly less than the older group, indicating a possible neutral or detached stance towards such content.
7. **Vulgarity:** The younger group had a shorter viewing time, suggesting a possible aversion or quicker emotional processing of such content.
8. **Positive Brand vs. Negative Brand:** Their viewing times were slightly shorter, indicating a more direct or straightforward approach to brand imagery (Tabel 3).

General Observations on 21+ Years Age Group's Eye-Tracking Behavior

Based on the extensive discussion and analysis of the eye-tracking data across the various groups, here's a comprehensive analysis of how the older age group (21+ years) perceives and reacts to the stimuli:

- The older age group generally exhibits longer viewing times across several groups, suggesting a more contemplative or reflective engagement with visual stimuli.
- Their gaze fixation counts are generally higher, indicating a more comprehensive or detailed examination of the content.
- The Gaze Fixation Saccade Ratio and Gaze Average Saccades Length in some groups indicate that the eyes of the older demographic might move more deliberately, possibly reflecting a more analytical or methodical nature.

Table 3. Eye tracking insights

Shock tactics in advertising	Trial Durations milliseconds	Gaze Fixation count	Gaze Fixations count per second	Gaze Fixation Saccade ratio	Gaze Average Saccades Length
Disgusting Images	6702.2578125	9.55	1.39	387.21	230.28
Religious Taboos	5607.125	7.67	1.42	425.85	268.92
Moral offense	5616.125	8.03	1.49	393.33	190.00
Sexual References	5158.1	7.50	1.48	395.17	239.28
Indecency	5210.158	6.80	1.28	1.28	357.74
Impropriety	5244.4	7.45	1.43	1.43	388.88
Vulgarity	5702.6	8.26	1.41	1.41	414.11

Source: developed by the author based on eye tracking research data

Specific Insights:

- Disgusting Images:** The older age group had a slightly longer viewing time, suggesting a more contemplative or perhaps a more emotional processing of disturbing content.
- Religious Taboos:** Their viewing times were almost similar to the younger age group, indicating a balanced or neutral stance towards religious imagery, but with a slightly more detailed examination.
- Moral offense:** The older group spent less time on these images compared to the younger group, suggesting a quicker judgment or perhaps a more established stance on content that challenges moral values.
- Sexual References:** Their gaze patterns indicate a more comprehensive examination, possibly reflecting the maturity or nuanced understanding typical of this age group.
- Indecency:** The older age group had a slightly shorter viewing time, suggesting a quicker judgment or perhaps a more established stance on ethically challenging content.
- Impropriety:** Their viewing times were longer than the younger group, indicating a more contemplative or perhaps a more emotional processing of such content.
- Vulgarity:** The older group had a notably longer viewing time, suggesting a deeper engagement or perhaps a more reflective approach to such content.
- Positive Brand vs. Negative Brand:** Their viewing times were slightly longer, indicating a more analytical or methodical approach to brand imagery.

Conclusions

In essence, eye-tracking indicators suggest that the younger age group engages with visual content in a more dynamic and focused manner. Advertisers should prioritize engaging, dynamic, and resonant messaging when targeting this younger demographic.

- The younger age group (16-20 years) appears to engage with visual stimuli in a more dynamic and perhaps exploratory manner. They seem to have a more focused or selective attention, especially when the content is emotionally or ethically charged. Brands aiming to target this younger demographic might consider content that is engaging, dynamic, and resonates with the curiosity and evaluative nature of this age group.
- The older age group (21+ years) appears to engage with visual stimuli in a more contemplative and methodical manner. They seem to have a more comprehensive or detailed examination, especially when the content is emotionally or ethically charged. Brands aiming to target this older demographic might consider content that is nuanced, reflective, and resonates with the analytical and methodical nature of this age group.

In essence, eye-tracking indicators suggest that the older age group engages with visual content in a more contemplative and comprehensive manner. Advertisers should prioritize nuanced, reflective, and resonant messaging when targeting this older demographic group. It's important to note that these generational characteristics are generalizations, and individual reactions can vary widely within each generation. Successful shock advertising should consider the specific target audience and take into account not only generational differences but also cultural, regional, and individual variations in consumer behavior and preferences. Additionally, ethical considerations should always guide the use of shock tactics in advertising.

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