JOURNAL OF GASTRONOMY HOSPITALITY AND TRAVEL

Research Article

FOODPORN: LDA ANALYSIS OF COMMENTS ON YOUTUBE VİDEOS IN THE CONTEXT OF HYPERSTIMULATION THEORY

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Abstract

People share photos and videos of the food and drinks they prepare and consume on social media platforms. Sharing such content on social media platforms creates awareness and increases engagement at both the individual and business levels. The term FoodPorn is one of the most commonly used hashtags when sharing sharing of such photos and videos. In this study, the effects of food preparation and presentation on viewers on social media platforms were determined using text mining based on the theory of hyperstimulation. The 3992 comments made by viewers on 5 videos available on the YouTube platform were analyzed using text mining software. According to the research findings, it was concluded that viewers were emotionally negatively affected by these videos. Additionally, it has been observed that viewers perceive these types of videos as sexual abuse, believe that food is being wasted and find them disgusting. It has also been concluded that these types of videos are perceived by viewers, albeit to a low extent, as interesting, funny and appetite-stimulating. These types of content, which visually stimulate viewers at a high level, have created positive emotions for some viewers while leading to negative perceptions for others.

Keywords: Hyperarousal, Gastroporn, Foodporn, Text Mining

Introduction

Nowadays, the expectations from food, which is the most basic need of humans, have also changed. Consumers, in addition to meeting their physiological needs with the food and beverages they consume, share visuals of the food they have consumed or will consume on various platforms. Social media provides the opportunity to share and spread photos and videos that include the preparation, serving, and consumption of food (Reichert,2020). Especially in recent years, with the increase in the number of users on social media platforms, the number of such posts has significantly increased. These types of posts, which depict food as provocative, bright, shiny, and appealing, are also closely followed by other social media users. One of the most preferred and interesting tags or titles when sharing of food videos and photos is the term "FoodPorn". Videos and photos shared with the foodporn tag or title can evoke emotional reactions and aesthetic experiences in viewers due to their visual appeal (Puliso, 2019).

The increase in the sharing of content that can be defined as "FoodPorn" across various platforms and the interest these shares receive mean that individuals possess a consumption understanding that encompasses not only physiological nutritional needs but also visual satisfaction. Elements such as bright colors, slow-motion shots, appetizing sound effects, and provocative movements featured in these visuals are the factors that maximize the emotional arousal of the viewers (Mejova, Abbar and Haddadi, 2021; Alikhani, 2023). In this

context, understanding why cooking videos are so captivating and examining the effects of this content on individuals have become an increasingly important area of research in academic studies.

The Arousal Theory provides an effective conceptual framework for understanding individuals' responses to intense visual and auditory stimuli. According to this theory, a certain level of stimulation can lead to positive or negative emotional responses in individuals (Yerkes and Dodson, 1908). Especially the "FoodPorn" content consumed on digital platforms has the potential to attract attention, gather likes, and even create addiction by challenging individuals' sensory thresholds with its visual and auditory elements. This situation can affect not only individual emotional experiences but also societal consumption habits.

With this study, it is aimed to reveal the behavioral and emotional effects of such content on individuals. To do this, the comments made by viewers on videos shared under the FoodPorn title on YouTube, one of the most important social media platforms today, is examined within the context of the overstimulation theory. The study also serves as a guiding reference for future research of this kind.

Literature Review

The term "FoodPorn," which was first used in a nutrition-related magazine to describe unhealthy foods, has gradually gained different meanings over time. The term was used by American sociologist Michael Jacobson in 1979 to "describe foods that are sensationally far from what they should be and could be considered pornographic" (McBride, 2010). Later, the term FoodPorn was associated with the aesthetic and cultural qualities of high-quality food (Donnar, 2017).

The term foodporn has become an important cultural phenomenon today, especially in the context of social media. It generally refers to the practice of sharing visually appealing food, often accompanied by the #foodporn hashtag. This term encompasses a blend of culinary enthusiasm and visual aesthetics, where food is not only a nourishment but also an object of desire and admiration. This phenomenon, which evokes sensory experiences and emotional responses in users, has become particularly popular on social media platforms like Instagram, where close-up food photos are published (Rinjani, 2017; Piluso, 2021). The act of sharing food visuals allows individuals to express their tastes and preferences while also enabling them to engage in broader social interactions that can affect their eating habits and emotional states (Mejova et al., 2021; Alikhani, 2023). This sharing, which is not only about the food itself, reflects a complex social dynamic interaction where the visual representation of food can evoke feelings of desire, nostalgia, or even guilt, depending on the context and the viewer's relationship with the food (Mejova et al., 2015).

Individuals may feel different motivations to engage with visuals shared in the FoodPorn category. Individuals can interact with such visuals not only because they are aesthetically appealing but also because they can evoke a sense of hunger and trigger emotional and physiological desires (Alikhani, 2023). Such visuals have the potential to shape the behaviors and preferences of the individuals who engage with them (Mejova et al., 2021; Alikhani, 2023). The term FoodPorn is quite provocative and sensual. It is generally associated with the preparation and presentation of food and beverages in advertisements, literature, and social media posts (Rinjani, 2017). Therefore, it serves as a tool through which we can analyze contemporary culinary practices and the evolving and changing nature of food consumption in the digital age.

Conceptual Framework and Determination of Research Questions

The theory of overstimulation addresses the effects of visual and auditory stimuli on the individual. Additionally, the theory of overstimulation posits that an individual's reaction to environmental stimuli varies depending on the intensity and severity of these stimuli. The fundamental basis of the theory is that visually impressive or emotionally strong high-level stimuli can significantly alter individuals' physiological states and emotional responses to the stimuli. (Yerkes and Dodson, 1908). In this context, social media platforms, especially YouTube, attract attention through FoodPorn videos where foods are displayed in a shiny and provocative manner. These videos have a high potential to trigger physiological responses such as appetite stimulation and hunger sensation, as well as emotional responses like anger, irritation and amusement.

The presentation of food and beverages in a shiny, attractive, aesthetic, glittering, and enticing manner is referred to as FoodPorn (Demir and Öztürk, 2023; Yıldırım and Doğan, 2022). Videos showcasing visually appealing presentations of food and beverages can whet the viewers' appetites. Mejova, Abbar and Haddadi (2016) state that FoodPorn has spread widely among social media users and has changed the way people interact with food. Research conducted by Spence and colleagues (2016) shows that the visual appeal of food

increases viewers' desire to eat and affects their sensory experiences. In this context, one of the research questions formulated within the scope of the study is as follows:

Research Question 1: Do FoodPorn videos lead to a significant increase in viewers' appetite and specific emotional responses?

Studies suggest that the appetizing characteristics of FoodPorn videos may increase consumption intentions. Coary and Poor (2016) emphasize that the produced food visuals trigger the desire to eat in viewers and that this situation affects eating behaviors. It is stated that digital food content can encourage viewers to consume more food without their awareness. This effect leads to an increase in the viewers appetite and intensifies their intention to consume food when they are exposed to visual food presentations (Herman and Polivy, 2008; Bordo, 2013). In this context, the research question developed is as follows:

Research Question 2: Do FoodPorn videos increase viewers' intentions to consume food?

Watching FoodPorn videos can affect not only appetite but also the feeling of hunger and other physiological responses. It is suggested that visual food stimuli can intensify the feeling of hunger in viewers by affecting brain activities and hormonal balances (Rozin et al., 2003). In this context, the attractive presentation of food can create a 'taste expectation' in the human brain, which can trigger the feeling of hunger (Plassmann et al., 2008; Spence, 2015). Based on these, the following research question has been developed:

Research Question 3: How does watching FoodPorn videos affect viewers' appetites and feelings of hunger?

FoodPorn videos not only affect appetite but also the emotional responses of the viewers. The presentation of food in the videos can lead to various reactions such as positive emotions (happiness, excitement) or negative emotions (guilt, regret) (Kristensen and Holm, 2006; Werle et al., 2015). Spence and colleagues (2016) state that visual food content can trigger positive emotions such as happiness in viewers but these reactions may vary depending on individual differences and contexts. In this context, the following research question has been developed:

Research Question 4: What emotional responses do FoodPorn videos evoke in viewers, and are these responses positive or negative?

Method

In this study, how videos that visually present food in an appealing way on social media platforms affect viewers will be determined based on the theory of hyperstimulation. In this context, the YouTube site has been chosen as the social media platform. The YouTube is an important platform where long-duration video shares on specific topics are made rather than short-duration video shares. Therefore, posts that feature extraordinary ways of food preparation and presentation and that attract a high number of followers have been taken into consideration. The data source of the research consists of text-based comments made by the audience who watched the unusual food preparation and presentation posts related to the shared videos. However, considering the popularity of platforms like YouTube and the numerous posts on the same topic, videos with more than 400 comments were selected as the data collection criterion. This criterion also facilitates the detection of the sensory responses of people to the shared videos. In this context, as a result of research conducted on YouTube, five video uploads that meet the mentioned criteria have been identified. There are a total of 3,992 text-based comments on the shared videos. The collected texts were analyzed using sentiment analysis and topic extraction techniques from text mining methods.

In the study, the visibility of comments made on the videos to everyone has ensured that this data is collected anonymously. Therefore, there is no need for an ethics committee decision for the use of such data. Similarly, it has been stated that comments accessible to everyone on online platforms can be used as a data source in accordance with ethical rules (Bruckman, 2002; Roberts et al., 2015).

Data Collection Method

In the research, web scraping technique was used as the data collection tool. One of the main advantages of the web scraping technique is its ability to convert unstructured web data into structured datasets. It is emphasized that web scraping particularly facilitates the conversion of large data sets into structured data that can be stored in spreadsheets (Mhouti, Fahim, Soufi and Alama, 2023). Similarly, it is emphasized that web scraping serves as a powerful tool for automating data collection, thereby enhancing the efficiency of data-driven processes (Drummond, 2023).

In the study, web scraping technique was applied to a total of 5 videos published on the YouTube site that met the data collection criteria and 3,992 text-based comments related to these videos were collected. The collected data has been transferred to an Excel file. Descriptive statistics for text-based data are presented in Table 1.

Table 1. Text Statistics for YouTube Videos

Total Number of Comments: 3,992
Total Number of Paragraphs: 4,270
Total Number of Sentences: 5,265
Total word count: 39,593
The number of words per sentence: 7.5
Number of words per paragraph: 9.3

To apply text mining methods to the collected texts, they have been transferred to the Wordstat 2024 program where text mining analyses can be conducted.

Text Mining Analysis Process

Text mining is a multifaceted process that involves extracting valuable information from unstructured text data. The text mining process generally consists of several stages. These steps are critically important because they transform unstructured text into a structured form that can be easily analyzed. Preprocessing techniques consist of tokenization, stemming, lemmatization, and stop word removal stages (Dařena and Žižka, 2015; Petrović and Stanković, 2019). Tokenization divides sentences in texts into words and phrases. Stop word removal, punctuation marks that do not convey meaning in the text and abbreviations are removed. Stemming and Lemmatization correct misspelled words (Landge and Rajeswari, 2016). Normalization converts the text to lowercase to standardize it.

These techniques have ensured the removal of unnecessary and meaningless words from the collected texts and the correction of misspelled words. Thus, more effective results have been achieved in sentiment and topic extraction analyses based on text mining. The descriptive statistics of the text preprocessing results are presented in Table 2.

Table 2. Text Statistics Obtained as a Result of Text Preprocessing

Total Number of Comments: 2,191
Total Number of Paragraphs: 2,353
Total Number of Sentences: 3,072
Total Word Count: 22,685
Average number of words per sentence: 7.4
Number of words per paragraph: 9.6

After this stage of the study, the obtained data were subjected to sentiment analysis.

Sentiment Analysis (SA),

Sentiment analysis (SA) is a text mining technique that reveals emotions in texts using approaches from statistics, machine learning and natural language processing (NLP). Sentiment analysis reveals the positive and negative opinions expressed in texts (Kadli and Vidyavathi, 2019; Iglesias and Moreno, 2019).

In sentiment analysis, machine learning and dictionary-based approaches can be used. In the dictionary-based approach, pre-determined words expressing emotions are used. The classification of emotions is done based on the presence of the identified words in a sentence or paragraph (Taboada et al., 2011).

In this study, dictionary-based sentiment analysis was applied to text-based data. The obtained results are presented in the findings section.

Topic Extraction

At this stage, the topic extraction technique has been used to determine which topics were expressed in the text-based data by the video viewers.

Topic modeling is an important approach that enables the identification of main themes in documents. It enables the discovery of hidden topics in large volumes of documents based on the co-occurrence frequency of words. The topic extraction technique uses the Latent Dirichlet Allocation (LDA) algorithm (Kim, Song and Song, 2015; Ogunwale, 2023; Rugeles, Hai et al., 2023).

Findings

The results of the sentiment analysis conducted to determine whether the comments made by viewers on YouTube videos are positive or negative are shown in Table 3.

Tablo 3. Sentiment Analysis Results

Sentiment	Frequency	No. Cases	% Cases	Tf • Idf
Negative	1642	1108	61,57%	486,1
Positive	1025	728	38,43%	490,5

According to the sentiment analysis results, viewers who commented on the videos used 1642 different negative words and 61.57% of the viewers evaluated the videos negatively. Additionally, viewers used 1025 different positive words and 38.43% of the viewers evaluated the videos positively. The graph obtained from the sentiment analysis is presented in Figure 1.

Figure 1. Sentiment Analysis of Keywords
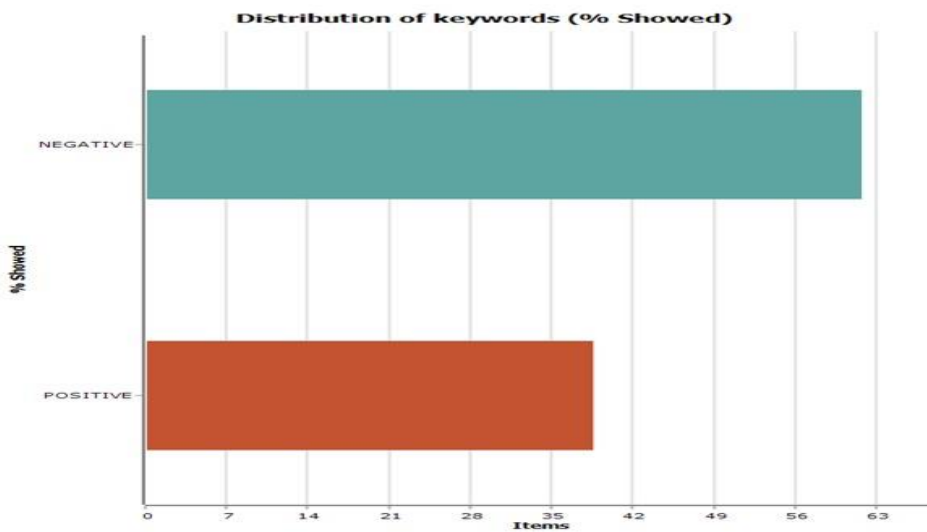
In the study, topic extraction was conducted to reveal the thematic structure of the dataset consisting of 2191 comments and to provide a clearer understanding of the general overview of the videos. Below, the results of the topic extraction analysis and the topics automatically clustered and named through WordStat have been revealed and presented in Table 4.

Tablo 4. Topic Extraction

|	TOPICS	FREQUENCY	% SHOWN	NUMBER OF COMMENT	% CASES	TF • IDF
1	Porn Sex and Real	327	23,71%	622	28,39%	178,9
2	Talk To God	290	21,03%	600	27,38%	163,2
3	Disgusting	149	10,80%	378	17,25%	113,4
4	Cooking and Show	138	10,01%	316	14,42%	116,3
5	Wasting Food	101	7,32%	176	8,03%	111,0
6	Sexually Assaulted	82	5,95%	104	4,75%	108,5
7	Stop Laughing	59	4,28%	90	4,11%	81,5
8	Makes and Laugh	56	4,06%	168	7,67%	62,5
9	Weird	56	4,06%	82	3,74%	79,7
10	Feeling Hungry	48	3,48%	79	3,61%	69,5
11	Everything and True	43	3,12%	121	5,52%	54,2
12	Interesting and Things	30	2,18%	96	4,38%	40,8

	100%	2832

Food and Eating/ Topic N. (4,5,10)
Sexual Content and References/ Topic N. (1,6,11)
Humor and Laughter/ Topic N. (8)
Religious and Spiritual References/ Topic N.(2,5)
Reactions and Emotions/ Topic N. (3,5,10,12)
Violence and Aggression/ Topic N.(3,7)
Surreal and Weird References/ Topic N. (8)
Human Relationships and Identity/ Topic N. (5)
Life and Philosophical Musings/ Topic N. (1,3,5,6)

According to the results of the topic extraction analysis, 23.71% of video viewers, with 622 comments, perceived the video content as obscene. In the second place, the topic has been interpreted as religiously objectionable with 21.03% of the votes and 600 comments. The third topic is that videos are considered disgusting with 10.8% of the votes and 378 comments. The fourth topic has been perceived as a Show with 10.01% of the votes and 316 comments. The fifth topic, with a rate of 7.32% and 176 comments, is considered to be about food waste. The sixth topic is perceived as abuse with a rate of 5.95% and 104 comments. The seventh topic is perceived as anger with the expression "stop laughing" with a rate of 4.28% and 90 comments. The eighth topic, with a rate of 4.06% and 168 comments, is perceived as the expression "makes and laugh" meaning finding it funny. The ninth topic, with a rate of 4.06% and 82 comments, is perceived as strange by the viewers. The tenth topic is the evocation of hunger, with a rate of 3.48% and 79 comments. The eleventh topic, with a rate of 3.12% and 121 comments, is the approval of the expression "everything and true" by the viewers. According to the analysis results, the last topic is the subject of finding it interesting with a rate of 2.18% and 96 comments from the viewers. These identified topics have been classified and categorized in Table 4.

Link Analysis

Link analysis visually represents the existence and strength of one or more connections between two or more subjects (Péladeau, 2021). In Table 2, a link analysis was applied between the relevant topics to understand the details of the subject headings obtained from the video comments.

Figure 2. Link Analysis Results
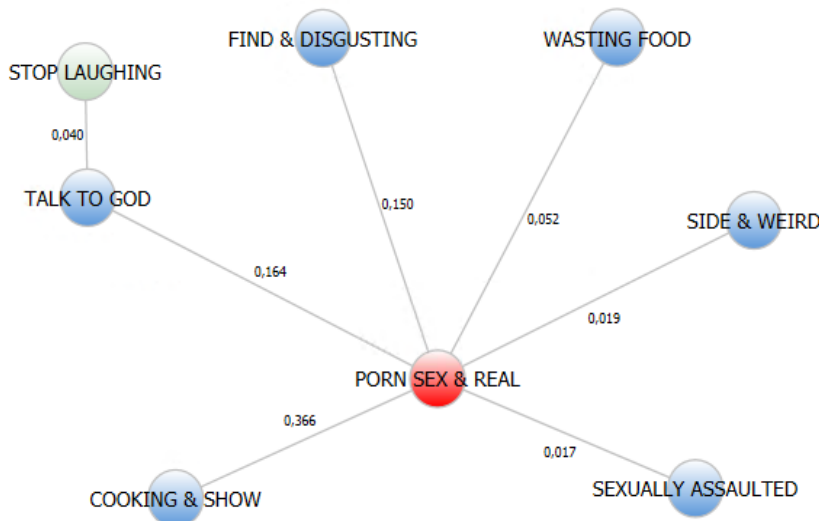
In Figure 2, the explanations of the topics are visualized according to the frequency of their co-occurrence, as obtained in Table 4. Accordingly, it has been observed that those who watch Foodporn videos perceive cooking shows (cooking and show) as the most prominent topic among the relationships they describe for these videos. In second place, they found the topic of (talk to god) to be religiously related and therefore, they expressed that they reacted to those who found the videos funny with the topic of (stop laughing). Video viewers have also expressed that they find the food recipes used in these videos to be treated in a sexual manner, which they

find disgusting. They think that the food used in the watched videos is being wasted. For viewers, another perspective is that they find the videos weird and consider them to be sexually assaulting.

Conclusion and Recommendations

In this study, the effects of FoodPorn content on viewers on YouTube were examined within the context of the Sensation Seeking Theory. The research findings reveal that visual and auditory stimuli create physiological, emotional and social responses in individuals. The results of the study are consistent with similar studies in the literature.

Emotional Reactions and Visual Perception Emotion analysis results show that 61.57% of viewers evaluated the videos in a negative context. These negative reactions have been associated with perceptions such as the food waste (7.32%) and the videos being found disgusting (10.8%). These results explain that foodporn videos evoke negative emotions in their viewers. The finding by Spence et al. (2016) that the visual presentation of food alters taste perception and the overall eating experience aligns with the interpretations in this study. However, the dominance of negative perceptions aligns with Yerkes and Dodson's (1908) theory which argues that excessive intensity of visual stimuli can have adverse effects on individuals. This is seen as a very significant outcome in terms of demonstrating that excessive visual stimuli have the potential to evoke disgust in individuals.

The findings obtained from the research have revealed that the visual aspects of food content can increase the feeling of hunger and appetite in viewers. However, although it was found that the appetite of those who watched these videos increased, this rate was seen to be quite low. Plassmann et al. (2008)'s study studies, which argues that taste expectations are shaped by visual stimuli, support these findings. Additionally, it is consistent with the studies by Rozin et al. (2003) and Uçuk et al. (2022), which emphasize that the attractive presentation of food can change individuals' eating habits.

According to the cultural and social dynamics topic inference analysis, a portion of the viewers (23.71%) associated the videos with obscene content. Mejova et al. (2016)'s study, which states that FoodPorn content interacts not only with food but also with cultural and social norms, provides a theoretical basis for these findings. The prominence of religious context comments (21.03%) indicates that digital gastronomy content can be perceived differently depending on the audience. Additionally, the interpretation of the food used in such videos as waste may be based on religious beliefs.

It has been observed that FoodPorn videos evoke positive emotions in 38.43% of cases. This situation supports the findings of Coary and Poor (2016) and Uçuk (2022) which emphasize the positive impact of the aesthetic presentation of food on consumer behavior. It is understood that digital content creators and brands have the potential to increase viewer's consumption intentions by using visually appealing content.

High levels of visual stimuli have created positive experiences for some viewers, while leading to negative perceptions for others. This situation is indicative of the non-linear relationship between stimulus intensity and behavior proposed by Yerkes and Dodson (1908).

Additionally, it appears that the emotional, social and cultural impacts of FoodPorn content provide significant insights into creating viewer engagement and influencing consumer behavior on digital platforms. However, it is clear that the videos need to be context-sensitive and designed to appeal to different cultural perceptions. (Kristensen and Holm, 2006; Werle et al., 2015).

Limitations and Recommendations of the Study

In this study, only the YouTube platform has been addressed. Future studies could examine the effects of different social media platforms and demographic variables such as age, gender, and cultural context. Additionally, EEG and other biometric measurement techniques can be used to gain a deeper understanding of the neurophysiological effects of visual stimuli.

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