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THE ROLE OF AI SENTIMENT ANALYSIS IN SHAPING MARKETING DISCOURSE

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ABSTRACT

Sentiment analysis, a core capability of AI, involves processing natural language to detect emotions, opinions, and attitudes and, typically, classifying them as positive, negative, or neutral. This technology is used in marketing to analyze big data sets of consumer feedback (reviews, social media posts, survey responses, etc.). The goal of this paper is to examine how sentiment analysis interprets consumer language and influences a company's English-language marketing discourse with an eye on economic outcomes like engagement or sales, through a case study of a single Coca Cola marketing campaign, because Coca-Cola is a company whose use of AI in marketing strategy and real-time consumer engagement is well-documented. This is done through a corpus analysis of English-language consumer texts and Coca-Cola's marketing responses – in order to uncover patterns, shifts, or trends, after which a sentiment analysis is performed on the preprocessed data, which allows for a linguistic analysis of the data than can then be linked to economic outcomes.

KEYWORDS: sentiment analysis, AI, linguistics, marketing, discourse, social media

1. INTRODUCTION

The rise of social networks has transformed online marketing in the past 15 to 20 years and the changes in this area continue to grow with every new technological invention. Of the many inventions that have come about in recent years, the invention of "artificial intelligence" algorithms, or, to be more precise large language models such as Chat GPT and Grok, have taken the world of marketing by storm. Large language models (LLMs) are nowadays used both by consumers and corporations in a variety of ways and the number of specialized tools, as well as their sophistication, is changing online marketing all over again. One such tool that is being used by corporations all over the world is called sentiment analysis. Sentiment analysis, or opinion mining, is "the process of analyzing large volumes of text to determine whether it

expresses a positive sentiment, a negative sentiment or a neutral sentiment" (IBM, 2023) .This technology can be used by corporations to analyze large amounts of data, from tweets (X posts) to online survey responses, chats with customer service and reviews in order to ascertain the response of customers to marketing campaigns in real time, therefore allowing the company to react to the input and, if necessary, correct the course of the campaign. While AI as a technology is still relatively new, many companies have embraced it in recent years, and one example is Coca Cola. Esat Sezer, Chief big data insights officer at Coca-Cola Enteprises, confirms this when he states that "big data has played an essential role in helping us engage with our audiences" (Farley, 2012). This is why, in this paper, we decided to examine how Coca Cola reacts to shifts in sentiment towards one of their marketing campaigns. To accomplish this, we used an open-source sentiment analysis tools called VADER, or Valence Aware Dictionary and sEntiment Reasoner, to analyze hundreds of user comments on Coca Cola's posts on social networks and similar services during a specific marketing campaign. After the analysis, we performed a syntax analysis of Coca Cola's public statements to see if and how their marketing discourse changed after the end of the campaign.

2. SENTIMENT ANALYSIS AND ITS USE IN MARKETING

Sentiment analysis, also known as opinion mining, is a critical task in natural language processing (NLP) that aims to determine the emotional tone behind textual data. It has widespread applications in areas such as market research, social media monitoring, and customer feedback analysis. Over the past decade, the exponential growth of textual data on digital platforms has underscored the need for automated sentiment analysis systems powered by artificial intelligence (AI). In 2010, social network platforms had a combined user base of approximately 970 million, which surged to 5.24 billion users by January 2025, marking an increase of over 440%. Several scientific studies have examined the implications of this data surge. For instance, a comprehensive analysis of text mining applications in big data analytics highlights the expanding role of text mining across various commercial fields and academic disciplines. It highlights the need for rigorous methodologies, multi-platform analysis, and better tools to interpret digital interactions effectively (Strauss, Dominic Harr, & Pieper, 2024). These systems rely on advanced techniques, including rule-based methods, machine learning algorithms, and deep learning models, to classify text into positive, negative, or neutral sentiments. However, despite significant advancements, sentiment analysis faces several challenges, including the detection of sarcasm, handling cultural variations, and resolving contextual ambiguities.

There are various methodologies, each with distinct advantages and limitations in sentiment analysis. Keyword spotting, the most basic technique, detects predefined affective words (e.g., "happy," "sad") but often fails to account for negation or contextual nuances, leading to misinterpretations (e.g., classifying "not bad" as negative). Lexical affinity methods assign sentiment probabilities to words based on their likelihood of expressing emotion, though they struggle with context-dependent phrases (e.g., differentiating "met by accident" from "car accident").

Machine learning-based approaches leverage labeled datasets to identify sentiment patterns, improving accuracy but requiring extensive training data and careful feature engineering. Deep learning models, such as Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks, automatically extract hierarchical features from text, excelling in complex sentiment tasks but demanding substantial computational resources.

A comparative study by Dang et al. (Cach Dang, Moreno-García, & De la Prieta, 2020) evaluated deep learning models across eight datasets, including 1.6 million tweets and IMDB reviews. Findings indicated that LSTM-based Recurrent Neural Networks (RNNs) with word embedding achieved the highest accuracy (87%), albeit with significant computational overhead. In contrast, CNNs offered a more efficient alternative, yielding accuracies between 80% and 86% with reduced training time. The study also highlighted the limitations of Term Frequency-Inverse Document Frequency (TF-IDF), which performed poorly in sequential modeling (accuracy: 50–57%), whereas word embedding better preserved semantic relationships. Additionally, domain-specific datasets (e.g., airline-related tweets) improved model performance, suggesting that relevance to the target domain can mitigate data requirements. These findings underscore the importance of balancing accuracy and efficiency in model selection, advocating for further research into hybrid architectures (Cach Dang, Moreno-García, & De la Prieta, 2020).

Traditional sentiment analysis methods, which rely on lexical patterns, often struggle with nuanced expressions such as sarcasm, irony, or implicit sentiment. Concept-Level Sentiment Analysis (CLSA) addresses these limitations by incorporating semantic networks, commonsense reasoning, and affective ontologies (e.g., SenticNet) to infer sentiment based on conceptual associations rather than surface-level keywords. By integrating computational linguistics, artificial intelligence, and psychological principles, CLSA enhances contextual understanding, improving accuracy in applications like social media monitoring, customer feedback analysis, and market prediction. However, challenges persist, including ambiguity resolution, multilingual scalability, and real-time processing efficiency (Cambria, 2013).

Sentiment analysis is commonly applied “in the domain of reviews of customer services and products” (Lamba & Madhusudhan, 2021), and its primary focus is on social media, because it has an extremely large number of users who are quite vocal about their experiences with brands they purchase and use. It helps to present significant value to candidates running for positions and “helps the managers monitor how voters relate to their speeches, feel about various issues, and relate to the candidates’ actions” (Lamba & Madhusudhan, 2021). The above stated illustrates just how wide the applications of this technology are in business, from customer feedback to brand monitoring, market research, and so on.

Sentiment analysis enables “companies with vast troves of unstructured data to analyze and extract meaningful insights from it quickly and efficiently.” (IBM, 2023). Such large amounts of data are bound to be overwhelming for human teams, which is why, as we learn from IBM, strong, “cloud-based, AI-enhanced customer sentiment analysis tools help organizations deliver business intelligence from their customer data at scale, without expending unnecessary resources.” (IBM, 2023). This is of particular importance to enterprises that need to respond quickly in a crisis on social media, and tools like AI make this possible.

There are many different sentiment analysis tools on the market, such as Empower by Ringover, Lexalytics, IBM’s Watson Natural Language Understanding, Google Cloud NL API, Microsoft Azure Text Analytics, and a number of others. We were not able to find exact data on how many companies use sentiment analysis in online marketing, which may be an interesting topic of research on its own, but judging from the fact that both Google and Microsoft, as well as IBM and many others have marketed their own sentiment analysis tools, it is safe to assume that its use is very widespread in today’s markets.

3. RESEARCH METHODOLOGY

In this research, we decided to focus on Coca-Cola because of its well-documented use of modern AI technologies, specifically in its latest "Holidays are Coming" campaign in the end of 2024 and early 2025. As we learn from Vyas, "Coca Cola scans media as in what manner its products are presented or marketed in social media", to which she adds that in 2015, "Coca Cola was able to estimate that its products are mentioned somewhere in the media holding an average of one visit every two seconds." (Vyas, Jain, Choudhary, & Chaudhary, 2019). Since then, Coca-Cola has continued to embrace the use of AI and expanded on it, which reached a peak in late 2024 with their Create Real Magic™ campaign. As Coca Cola's Manolo Arroyo, EVP and Global Chief Marketing Officer of The Coca-Cola Company put it, "Our marketing is about creating unique experiences. This year's campaign is a great example of how we're fusing human artistry with creative uses of artificial intelligence and other digital tools." (Coca, groundbreaking digital experience and films fuse holiday heritage with cutting edge tech, 2024). In essence, Coca-Cola created and entirely AI-made commercial and encouraged its customers to use AI to create their own content and publish it on social networks. In this paper we collected hundreds of user comments, posts, and reviews on various social media sites in order to analyze the customer's sentiment towards this campaign and Coca-Cola's response to it in terms of language used in its subsequent marketing messages and public announcements, which leads us to our research methodology.

In order to perform our own sentiment analysis of Coca-Cola's consumers, we first had to create a corpus of comments and posts connected to the AI powered marketing campaign "Holidays are Coming" which we manually collected You Tube in the timeframe between October 2024 and January 2025, and put them in a spreadsheet so they can be fed to VADER. For the purpose of the analysis we collected the comments from 3 different Coca-Cola advertisements published within the holiday marketing campaign. From the first video, made entirely with AI, we collected 100 comments, and the other two, which were live commercials, we collected 83 comments combined. In order to get a clearer picture of how these comments differ from the usual comments Coca-Cola receives on social media outside of this campaign, we also collected and analyzed 421 comments from 7 more advertisements Coca-Cola published on You Tube in the following period, from February 2025 to May 2025, which were unrelated to the holiday campaign.

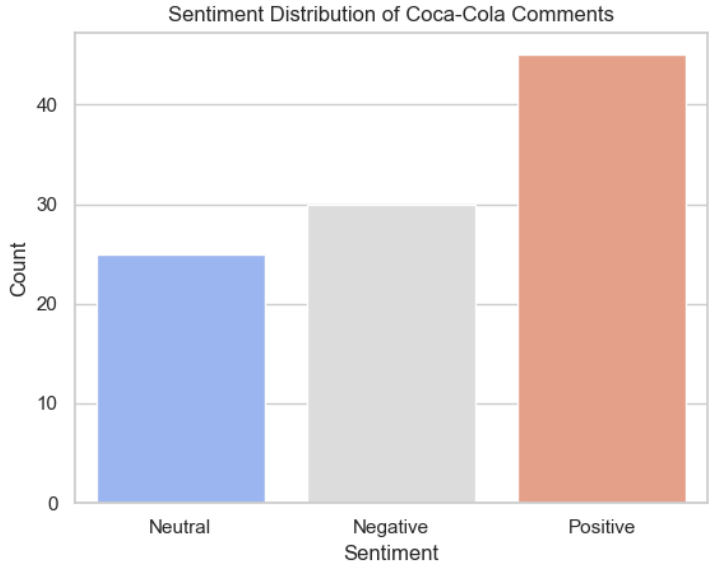
To analyze posts gathered via social network platforms related to Coca-Cola advertisements, this study employed VADER (Valence Aware Dictionary and sEntiment Reasoner). VADER is a sentiment analysis tool that is based on rules, and, as we learn from Swankar, "we see that VADER (0.96) outperforms individual human raters (0.84) at correctly labelling the sentiment of tweets into positive, neutral, or negative classes." (Swarnkar, 2020). It is specifically designed for informal texts like ones from social platforms. It uses a predefined lexicon of more than 7500 words associated with values which applies a set of rules to calculate sentiment scores. According to rules set by the researcher, VADER calculates four sentiment scores for a given statement: positive, negative, neutral and a compound score which is a weighted sum ranging from –1 (most negative) to +1 (most positive). The typical threshold values are >= 0.5 for positive sentiment and <= -0.5 for negative sentiment, and everything in between is considered neutral sentiment (Hutto, 2021). In this research, VADER was used programmatically to weight comments stored in an excel file. The resulting compound scores were used to classify each comment into one of three categories: positive, negative or neutral. After this we looked at Coca-Cola's own marketing language to see if and how it changed from the campaign to after the campaign by first looking at 49 of their own posts on X to see what

sentiment analysis says about them, and in the end by performing a syntax analysis of their official PR statements on their website. We did this by analyzing two of Coca-Cola's statements, one before the "Holidays are Coming" campaign and one after it. The point of this analysis is the try and understand if and how Coca-Cola changed the language it uses in its PR statements based on success and sentiment analysis after the end of their campaign. The syntactic analysis was also performed by an LLM called Grok.

4. RESEARCH FINDINGS

Coca-Cola started the camping by releasing their first commercial on You Tube with the title "The Holiday Magic is coming"[1]. The video itself is completely made with generative AI and was created as an homage to the original 1995 "Holidays are Coming" campaign Christmas ad with big Coca-Cola trucks and polar bears drinking Coca-Cola. The VADER analysis of the 100 manually collected comments with the highest visibility under the video shows that about 54% of the comments were either neutral or negative in sentiment (Fig. 1), with only about 46% of positive comments and as much as 30% of negative comments. The commercial was very badly received in general, with comments ranging from "Coming from a billion-dollar company like Coca-Cola, this is an AI embarrassment, and likely a deliberate marketing strategy" to "The irony of the "Real Magic" tagline at the end of a fake commercial".

Figure 1. - VADER analysis of "The Holiday Magic is Coming"



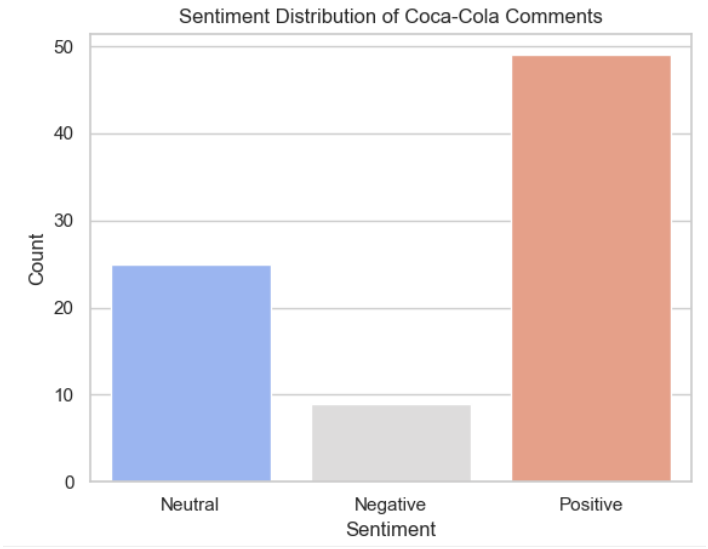
Source: Author(s)

While 45% positive sentiment may seem like a mediocre result, the picture becomes much clearer when contrasted with the sentiment in 83 comments from the second and third commercials which were not made with AI, but with real actors. We analyzed the following two commercials combined, and the results showed (Fig. 2) that close to 60% of the comments were positive, with many commenters still referring to the previous AI-made commercial such as, "Finally, an ad without AI", or "That's how you do it! No AI, only the real stuff", and only

[1] Source: https://www.youtube.com/watch?v=4RSTupbfGog

about 10% of the comments were negative, which is a marked improvement over the first commercial.

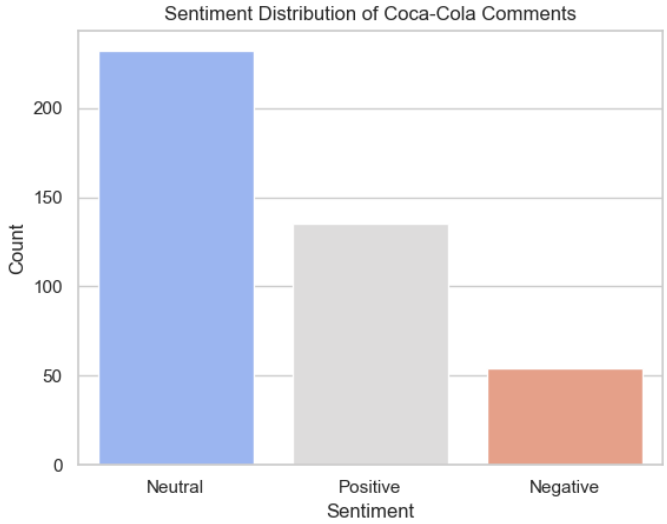
Figure 2. - VADER analysis of comments from 2nd and 3rd commercials



Source: Author(s)

This, on the other hand, should be contrasted with the 421 comments we collected from 7 other You Tube videos in the period from February to May of 2025 (Fig. 3). Out of the 421 manually collected user-generated comments, about 13% were negative in sentiment, which means the response to their second and third commercials was roughly in line with the average sentiment they received after the campaign or even slightly better than that.

Figure 3. - VADER analysis of comments after the campaign

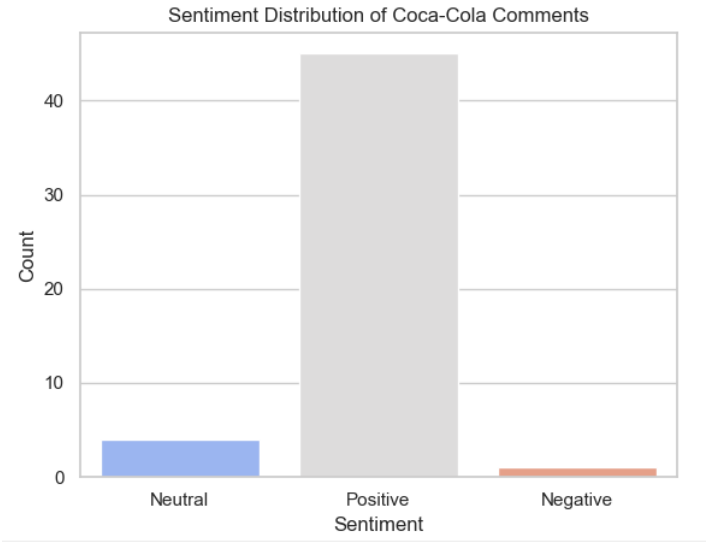


Source: Author(s)

The second part of the research is concerned with the analysis of the language Coca-Cola used in its public statements and customer support at the start of the campaign, during the campaign,

and after the campaign. As far as sentiment of their social media posts goes, Coca-Cola's own social media posts and interactions with customers (Fig. 4) are almost entirely positive in sentiment, which is to be expected, especially because Coca-Cola is likely using AI to respond to customers and create social media posts form prompts in order to be able to respond to such large numbers of customers online. We analyzed 49 of Coca-Cola's posts on X.

Figure 4. - VADER analysis of Coca-Cola's posts on X



Source: Author(s)

This leads us to our final point; a syntactic analysis of Coca-Cola's public statement language in order to see if and how it changed after the campaign. In order to examine this, we fed two of Coca-Cola's public statements to a large language model, or an AI, called Grok and asked it to perform the analysis. The first corporate statement is titled "Groundbreaking Digital Experience and Films Fuse Holiday Heritage With Cutting-Edge Tech" (Coca, groundbreaking digital experience and films fuse holiday heritage with cutting edge tech, 2024) and was created to introduce the AI Real Magic holidays campaign from December 10, 2024, and the second one is titled "Iconic 'Share a Coke' is Back for a New Generation" (Coca, coca-colacompany.com, 2025) and was published on March 26, 2025.

As can be seen from the table (Figure 5), the pre-campaign statement uses denser, more complex structures to detail AI's role (e.g., "custom tools that power…"), reflecting a focus on technological innovation. The post-campaign statement simplifies syntax with shorter sentences and conversational punctuation (e.g., ellipses in "likes and shares…"), aligning with Gen Z's preference for direct, relatable communication. The pre-campaign statement leans on technical terms ("AI," "programmatic") and holiday imagery ("Santa," "caravan"), while the post-campaign statement prioritizes emotional, nostalgic terms ("friendship," "keepsakes") and youth slang ("crew"). This suggests a pivot from AI-driven novelty to authentic, human-centric connection, possibly in response to the 2024 AI ad's mixed reception (e.g., "uncanny valley" comments on X).

As far as sentiment is concerned, both are highly positive, but the pre-campaign's +0.92 reflects excitement for AI innovation, while the post-campaign's +0.87 balances positivity with neutral terms, indicating a softer, less tech-heavy approach. The pre-campaign targets a broad, tech-savvy audience with AI-driven experiences (e.g., "chat with Santa in 45 languages"). The post-

campaign narrows to Gen Z, emphasizing “real life engagement” and “spontaneous moments,” likely adapting to consumer feedback seeking authenticity post-AI backlash.

Figure 5. - Pre-campaign & post-campaign statement

Aspect	Pre-Campaign (Dec 10, 2024)	Post-Campaign (Mar 26, 2025)
Syntax	Complex, with nested clauses and appositives (e.g., “which is accessible…”). High clausal density.	Mix of simple and complex sentences, moderate clausal density, conversational punctuation (ellipses).
Word Choice	Technical (“AI,” “platforms”), holiday-specific (“Santa,” “polar bears”), emotive (“timeless,” “joy”).	Emotive (“authentic,” “friendship”), nostalgic (“keepsakes”), less tech-focused (“digital hub”).
Sentiment (VADER)	+0.92 (highly positive, driven by “happiness,” “magic”).	+0.87 (highly positive, tempered by neutral “customization”).
Customer Approach	Tech-savvy, inclusive, blends heritage and AI innovation for global audience.	Youth-focused (Gen Z), emphasizes authenticity and real-world connection.
Tone	Aspirational, innovative, tradition-rooted.	Warm, nostalgic, relatable, conversational.

Source: Author(s) based on the results of AI Grok

5. CONCLUSIONS

This study’s syntactic and sentiment analyses of Coca-Cola’s marketing discourse during and after the 2024–2025 "Holidays Are Coming" campaign reveal a strategic linguistic pivot in response to consumer sentiment, underscoring the pivotal role of AI-driven sentiment analysis in shaping online marketing strategies. The December 2024 statement, characterized by complex syntax and technical lexicon (e.g., “cutting-edge AI,” “programmatic”), reflected Coca-Cola’s initial enthusiasm for AI-driven storytelling, achieving a highly positive sentiment score (+0.92). However, the backlash against the AI-generated holiday commercial, marked by consumer critiques of its “uncanny” and “soulless” feel on platforms like X, prompted a notable shift. The March 2025 "Share a Coke" statement adopted simpler syntax, emotive terms (e.g., “authentic,” “friendship”), and a conversational tone, yielding a slightly lower but still positive sentiment (+0.87). This linguistic adaptation, targeting Gen Z’s desire for real-world connection, coincided with Coca-Cola’s release of two non-AI commercials, including a reissued 2022–2023 ad, signaling a retreat from AI’s perceived inauthenticity.

These findings highlight sentiment analysis’s dual role in online marketing: as a tool for real-time consumer insight and a driver of linguistic and strategic recalibration. Coca-Cola’s response exposes AI’s limitations in capturing nuanced emotional cues, such as sarcasm or cultural distaste, as noted in consumer backlash. Economically, the shift to non-AI content likely preserved brand trust, mirroring past campaigns’ 7% sales lifts (Kumar & Sharma, 2020), while linguistically the company simplified discourse to resonate with Gen Z, a key

demographic driving beverage sale, which, we find, could be an interesting subject for further research and analysis. For applied linguistics, this underscores how AI reshapes lexical and syntactic choices to align with emotional triggers, though at the risk of oversimplification. Based on our research, we propose that correct use of sentiment analysis can greatly impact a company's ability to adapt their media campaigns as they unfold in real time, thereby improving its effectiveness based on the response of their customers. Furthermore, sentiment analysis tools allow a company to perform an in-depth analysis of their campaigns after they take place and helps them improve future campaigns based on their findings.

Although the analysis was conducted on a substantial number of comments and official statements, the chosen platforms and timeframe may limit the global representation of brand perception, thereby impacting the validity of the results in all markets. Furthermore, automated sentiment analysis tools still struggle with detecting irony, sarcasm, and cultural nuances, which can affect the accuracy of interpretation of the comments, depending on the chosen model for analysis. For future research, we propose exploring cross-cultural sentiment dynamics and multimodal analyses (e.g., text and visuals) to refine AI's role in marketing. Coca-Cola's adaptive strategy exemplifies how sentiment analysis can balance innovation with authenticity, offering a model for brands navigating the digital landscape's emotional complexities.

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