



5-2022

## A Sentiment Analysis of Influencer and Brand Instagram Comments Before and After Scandal

Precious Inofomoh

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# A Sentiment Analysis of Influencer and Brand Instagram Comments Before and After Scandal

## Abstract

Brands are turning to social media for the marketing of their products. With the rise of social media marketing came the emergence of influencers, key opinion leaders with social media followings. As influencer marketing continues to be employed by brands, their concern of being implicated in an influencer scandal grows. This study investigates the impact of scandal on social media sentiment related to the influencer and a brand they endorse. A sentiment analysis was conducted using comments made on Instagram posts of the influencer and brand shortly before and after the scandal. Results show an increase in the strength and positivity of sentiment towards the influencer post-scandal. Results also indicate that comment sentiment towards the brand post-scandal is not significantly different from pre-scandal.

## Keywords

Instagram, influencer, social media, comment sentiment

## Disciplines

Business

A SENTIMENT ANALYSIS OF INFLUENCER AND BRAND INSTAGRAM COMMENTS  
BEFORE AND AFTER SCANDAL

By

Precious Inofomoh

An Undergraduate Thesis submitted in partial fulfillment of the requirements for the  
JOSEPH WHARTON SCHOLARS

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THE WHARTON SCHOOL, UNIVERSITY OF PENNSYLVANIA  
MAY 2022

## ABSTRACT

Brands are turning to social media for the marketing of their products. With the rise of social media marketing came the emergence of influencers, key opinion leaders with social media followings. As influencer marketing continues to be employed by brands, their concern of being implicated in an influencer scandal grows. This study investigates the impact of scandal on social media sentiment related to the influencer and a brand they endorse. A sentiment analysis was conducted using comments made on Instagram posts of the influencer and brand shortly before and after the scandal. Results show an increase in the strength and positivity of sentiment towards the influencer post-scandal. Results also indicate that comment sentiment towards the brand post-scandal is not significantly different from pre-scandal.

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## 1. INTRODUCTION

The rise of social media has changed the way many brands choose to market their products. Of the social media users who prefer browsing to posting, 54% use social media to research products (Beer 2018). With an estimated 49% of the world using social media as of January 2020 (Statista 2022), it has become an attractive avenue to marketers, and for good reason. With the growth of social media has come the emergence of social media influencers. Social media influencers (referred to simply as influencers) are defined as social media opinion leaders characterized by their following size and ability to influence discourse (Watts and Dodds 2007). They typically have particular fields of influence, for example beauty or fitness. They have built up a dedicated following and are able to affect the brand perceptions and purchase decisions of their audience through their posts (De Veirman, Cauberghe, and Hudders 2017; Colliander and Dahlén 2011; Lee and Watkins 2016). As a result, influencer marketing has become more prevalent in recent years. The influencer marketing industry is projected to be valued at \$16.4B in 2022, an increase of over 800% from 2016 (Santora 2022).

Some influencers have been caught in scandal, impacting their own perception and the perception of brands linked to them. For example, the “Operation Varsity Blues” scandal was a prominent one which received substantial media attention in 2019. In this scandal, it was revealed that celebrity parents had been bribing college admissions officials to accept their children into their schools (CBS News 2019). As a benefactor of one such bribe, Olivia Jade, daughter of celebrities Lori Loughlin and Mossimo Giannulli, was publicly implicated in the scandal. Prior to the scandal, Olivia Jade was partnered with several large brands including Sephora, HP, and Calvin Klein. In response to the scandal, consumers called on these brands to

end their partnerships with her, and at times chose to boycott the brands (Kintu and Ben-Slimane 2020).

This study focuses on the impact an influencer's scandal has on the brands they endorse or collaborate with. This impact is evaluated through analyzing the sentiment of consumers on social media through Instagram comments on posts made by the influencer and a brand they are partnered with shortly before and shortly after the occurrence of the scandal. Sentiment scores were assigned to each comment. The samples were tested for significant differences pre- and post-scandal.

The key findings of this paper are that the strength of sentiment in social media comments toward the scandalized influencer grows following the scandal, and in fact becomes more positive. In contrast, the online sentiment toward the endorsed brand is not significantly different post-scandal, neither in strength nor in directionality. The implications of these findings and theories behind them are discussed in detail. The results of this paper will be helpful to brands considering the effects of an influencer's scandal on their social media performance.

Additionally, this study will be useful to influencer agencies in offering advice to their clients on how to avoid scandal.

## **2. LITERATURE REVIEW**

### **2.1 Influencer-Brand Partnerships**

In the past, brands would utilize celebrity endorsements to increase brand awareness, benefit brand image, and increase profitability (Atkin and Block 1983; Amos, Holmes, and Strutton 2015; Misra and Beatty 1990; Agrawal and Kamakura 1995). Recently, there has been an increase in the number of brands who choose to partner with influencers rather than, or in addition to, celebrities. Social media influencers are seen as more accessible, trustworthy, relatable, and authentic than celebrities due to the close relationships they've built with their followers (De Veirman et al. 2017; Matheson and Sedgwick 2021; Schouten, Janssen, and Verspaget 2020). Additionally, a partnership with an influencer is typically less costly than a partnership with a celebrity (Mallipeddi, Kumar, Sriskandarajah, and Zhu 2020), so influencer marketing is often seen as a more cost-effective strategy for increasing brand awareness.

These influencers, who are key opinion leaders, endorse the brand's products to their following, and will sometimes even collaborate with the brand on a product which can be targeted to their following. Research has demonstrated the importance of choosing an influencer who is congruent with the brand's image (Torres, Augusto, and Matos 2019; Misra and Beatty 1990; Shan, Chen, and Lin 2019; Choi and Rifon 2012). Factors such as following size, social presence, and domain expertise can determine the likeability of an influencer, as well as whether or not they are a proper fit with the brand (R. Britt, Hayes, B. Britt, and Park 2020; De Veirman et al. 2017; Gross and Wangenheim 2018).

## **2.2 Scandals**

Scandal is defined as an event of moral transgression which is publicly denounced by non-participants (Thompson 2000). When an influencer is caught in scandal, news of it spreads



quickly and all social media users are invited to participate in the ensuing discussion (Piazza and Jourdan 2017). Furthermore, many influencers are fairly new to having influence over large amounts of people, and as such may be less prepared to deal with public scrutiny. The perceived heightened potential for scandal is a significant concern when it comes to partnering with influencers. Research suggests the existence of a ‘spillover effect’, that is that the transgressions of an influencer may negatively impact brands they work with (Reinikainen, Tan, Luoma-aho, Salo 2021; Jourdan, Qiu, and Galeshchuk 2019). Consumers may label the brand as ‘guilty by association’ (Kintu and Ben-Slimane 2020), though there is no tangible wrongdoing on their part. However, research shows that the way in which a brand responds to the backlash of a scandal (Kintu and Ben-Slimane 2020) and the way in which consumers choose to attribute blame (Um 2013) can determine how severe its effects are on the brand. The current literature fails to examine how this spillover effect takes form on social media; this study aims to fill that gap.

### 3. HYPOTHESES

Following a review of the literature in the field, the following hypotheses were developed.

**H1: Sentiment towards the influencer post-scandal will be significantly more negative compared to pre-scandal.**

The relationship between an influencer and their followers is negatively affected by any scandal caused by the influencer (Reinikainen et al. 2021). The theory is that followers of the influencer

will take to Instagram to express their displeasure and feelings of betrayal. Additionally, a scandal is likely to cause new people to comment on influencer's posts specifically to condemn their actions. Even if the comments do not become completely negative, there should be a sharp decline in the proportion of comments which are positive, which would shift the average sentiment to be more negative.

**H2: Sentiment towards the influencer post-scandal will be significantly stronger compared to pre-scandal.**

This hypothesis aims to address the magnitude of the sentiment post-scandal. In addition to being more negative on average, this paper hypothesizes that the comments will be more passionate, and perhaps more polarizing, than pre-scandal. A subset of the influencer's most loyal followers will continue to support them with positive comments and the sentiment of their positive comments will grow stronger in order to compensate for the influx of negative ones. Additionally, the number of comments directly criticizing the influencer will cause the average sentiment to increase.

**H3: Sentiment towards the brand post-scandal will be significantly more negative compared to pre-scandal.**

Research shows that brand engagement is typically lower on a brand's social media than on the social media of an influencer endorsing their products (Lou, Tan, and Chen 2019). The negative spill-over effect previously mentioned states that the transgressions of an influencer will

adversely impact the brands they are partnered with. This paper hypothesizes that this effect will reflect itself in the Instagram comments of the endorsed brand. People will begin commenting on the endorsed-brand's posts, expressing their displeasure with the scandal. As a result, the comments made will become more negative on average.

**H4: Sentiment towards the brand post-scandal will be significantly stronger compared to pre-scandal.**

Pre-scandal, most comments will be focused on the brand itself and its products. Post-scandal, more comments will discuss the scandal and the brand's partnership with the influencer. As a result, the sentiment should be stronger on these comments.

## 4. METHODS

### 4.1 Data Collection

Three cases were identified for use in this study. In each case, the influencer was involved in a scandal, and the influencer had a preexisting partnership with a brand. The first such case is of Laura Lee and Ulta Beauty. Lee, a beauty influencer with a large following on Instagram and YouTube, had tweeted racist statements in 2012 which resurfaced in the summer of 2018 (Frey 2018). The second case covers James Charles and Morphe. Charles is another beauty influencer impacted by scandal. In early 2021, he was accused of inappropriate romantic involvement with underage boys (Vujić 2021). At the time of the alleged incidents, Charles was twenty-one years old and the minors were sixteen; Charles claimed he was told they were eighteen. In the final

case, fitness influencer Brittany Dawn was partnered with wellness company Tropeaka. Dawn had offered customized fitness plans to followers who paid a subscription fee. After years of offering this service, complaints against it reached a peak in early 2019, most claiming that the plans were generic, and that calling them customized was false advertising (Shamsian 2019).

The date of the scandal was then identified using news articles and tweets made on the subject. For each case, Instagram posts were chosen from the influencer's account and the brand's account from before and after the scandal. InsC, a browser extension for exporting comments made on Instagram posts, was used to scrape the comments on each of the resulting 12 Instagram posts and export them to CSV files. The data were then aggregated into four datasets determined by which role the account plays and when the post was posted (i.e. comments made on influencer posts pre-scandal were combined into one CSV file, comments made on brand posts pre-scandal were combined into a separate CSV file, etc.) For each comment, the following information was collected:

- The username of the user who posted the comment
- A link to the user's profile picture
- The text of the comment
- The number of likes the comment received
- The number of replies the comment received, or if the comment itself was a reply
- The timestamp of the comment
- Whether or not the user is verified
- A link to the user's profile

## 4.2 Data Preprocessing

Comments irrelevant to the sentiment analysis were then filtered out of each dataset. This filtering process involved removing comments which replied to other comments, comments made by the original influencer or brand account, comments on the pre-scandal post made after the scandal had occurred, and comments with no text. For each remaining comment, tags (as in a user tagging another user), emojis, non-English words, and punctuation were removed. A sample transformation is included in the appendix (Figure 1).

Any comment void of text following these steps was then removed from the dataset. Following this data preprocessing, there were 4,097 comments in the influencer pre-scandal dataset, 16,575 comments in the influencer post-scandal dataset, 227 comments in the brand pre-scandal dataset, and 253 comments in the brand post-scandal dataset.

## 4.3 Sentiment Analysis

TextBlob, a natural language processing Python library, was used to conduct the sentiment analysis. Using TextBlob, each comment was assigned a polarity score (a number in the range  $[-1.0, 1.0]$  where  $-1.0$  indicates totally negative sentiment and  $1.0$  indicates totally positive sentiment) and a subjectivity score (a number in the range  $[0.0, 1.0]$  where  $0.0$  indicates totally objective sentiment and  $1.0$  indicates totally subjective sentiment). Using its polarity score, each comment was also categorized as either positive (polarity  $> 0$ ), negative (polarity  $< 0$ ), or neutral (polarity = 0).

Tokenized Text Analyzed	Polarity	Classification	Subjectivity
“happy birthday sister back love”	0.43	Positive	0.53
“stunning”	0.5	Positive	1.0
“didnt make mistake u still choice mistake wont let go really found guess u one image real bad girl”	-0.4	Negative	0.6
“hey”	0.0	Neutral	0.0

**Table 1. Sentiment Analysis Examples**

## 5. RESULTS AND DISCUSSION

### 5.1 Pre- and Post-Scandal Sentiment on Influencer Posts

A two-sample, two-sided t-test was conducted to find the difference in sentiment in the pre- and post-scandal datasets. Results showed a significant increase in the directionality of comment sentiment ( $M_{\text{pre-scandal}} = 0.238$ ,  $SD = 0.318$ ;  $M_{\text{post-scandal}} = 0.362$ ,  $SD = 0.386$ ;  $t = -21.345$ ,  $p < .001$ ) (Figure 2). Thus, hypothesis 1 was not supported.

To represent strength of sentiment, the absolute value of each comment’s polarity score was taken. A two-sample, two-sided t-test indicated that the average strength of sentiment significantly increased post-scandal within the influencer datasets ( $M_{\text{pre-scandal}} = 0.262$ ,  $SD_{\text{pre-scandal}} = 0.298$ ;  $M_{\text{post-scandal}} = 0.397$ ,  $SD_{\text{pre-scandal}} = 0.349$ ;  $t = -25.019$ ,  $p = 0.492$ ) (Figure 3). Hypothesis 2 was thus supported.

	Pre-Scandal	Post-Scandal	Change
Number of Comments	4097	16575	+304.56%
Mean Comment Sentiment	0.24	0.36	+52.02%
Mean Comment Sentiment Strength	0.26	0.40	+51.46%
Proportion of Negative Comments	3.20%	4.60%	–

**Table 2. Sentiment of Comments on Influencer Posts**

### 5.2 Pre- and Post-Scandal Sentiment on Brand Posts

Comments made on brand Instagram posts did not experience a significant change in sentiment post-scandal ( $M_{\text{pre-scandal}} = 0.146$ ,  $SD_{\text{pre-scandal}} = 0.306$ ;  $M_{\text{post-scandal}} = 0.166$ ,  $SD_{\text{pre-scandal}} = 0.319$ ;  $t = -0.688$ ,  $p = 0.492$ ) (Figure 4). There was also no significant change in the strength of sentiment ( $M_{\text{pre-scandal}} = 0.182$ ,  $SD_{\text{pre-scandal}} = 0.286$ ;  $M_{\text{post-scandal}} = 0.223$ ,  $SD_{\text{pre-scandal}} = 0.281$ ;  $t = -1.606$ ,  $p = 0.109$ ) (Figure 5). As such, hypotheses 3 and 4 were not supported.

	Pre-Scandal	Post-Scandal	Change
Number of Comments	227	253	+11.45%
Mean Comment Sentiment	0.1461	0.1657	+13.44%
Mean Comment Sentiment Strength	0.1817	0.2234	+22.92%
Proportion of Negative Comments	3.20%	4.60%	–

**Table 3. Sentiment of Comments on Brand Posts**

### 5.3 Discussion of Findings

The results show that sentiment on influencer Instagram posts increases in strength and in positivity following an influencer-caused scandal. To further examine why this was the case, each comment was categorized according to its polarity: Positive for polarity > 0, Negative for polarity < 0, and Neutral for polarity = 0 (Figure 6). The proportion of negative-to-nonnegative comments made on influencer posts was significantly different following the scandal ( $\chi^2 = 16.65$ ,  $df = 1$ ,  $p < .001$ ). The proportion of negative comments increased from 3.20% pre-scandal to 4.65% post-scandal. The proportion of positive comments concurrently increased from 48.99% to 61.01% post-scandal. As a result, the comments on influencer's posts were more polarizing post-scandal.

The strength of positive comments made on influencer posts rose significantly post-scandal ( $M_{\text{pre-scandal}} = 0.511$ ,  $SD_{\text{pre-scandal}} = 0.221$ ;  $M_{\text{post-scandal}} = 0.622$ ,  $SD_{\text{pre-scandal}} = 0.235$ ;  $t = -20.427$ ,  $p < 0.001$ ), while there was no significant difference between the strength of negative comments pre- and post-scandal ( $M_{\text{pre-scandal}} = 0.378$ ,  $SD_{\text{pre-scandal}} = 0.227$ ;  $M_{\text{post-scandal}} = 0.379$ ,



$SD_{\text{pre-scandal}} = 0.268; t = -0.057, p = 0.477$ ). Thus, the increase in negative comments was counteracted and suppressed by overwhelming positive sentiment coming from the positive comments, and average sentiment became more positive following the scandal. As proposed in hypothesis 2, it is possible that a subset of the influencer's followers did not feel that the relationship between themselves and the influencer was harmed by the scandal; as such, these followers may make heavily positive comments in defense of the influencer.

There was no significant change in the strength or directionality of comments made on brand posts. Influencer scandals negatively affect brand attitude, brand trust, and purchase intentions of the endorsed brand (Reinikainen et al. 2021), however this effect may manifest less strongly in social media comments. Research indicates that brands experience lower levels of consumer engagement on social media than influencers do (Lou et al. 2019). Therefore, while consumers take to social media to express their displeasure with the guilty influencer, they may choose to voice their displeasure towards the brand by not purchasing the brand's products.

## **6. LIMITATIONS AND FUTURE RESEARCH**

This research explores the existence of a scandal spillover effect in the social media domain. This study did not find evidence of a significant change in sentiment towards brands endorsed by influencers caught in scandal. There is evidence that social media sentiment towards the influencer grows following a scandal. This research contributes to the literature of social media influencer marketing by examining how social media sentiment is impacted by an influencer's scandal. It also contributes to the literature on a scandal spillover effect.

There are several limitations to this research. Firstly, sentiment analysis is not infallible. Some comments which would have been labeled one way by a human evaluator may have been labeled differently by TextBlob. It is difficult to detect sarcasm in social media comments using a sentiment analysis tool such as TextBlob. Additionally, abbreviations and misspelled words were removed from the datasets when filtering out non-English words; had these words been unabbreviated and properly spelled, their sentiment may have impacted results.

Instagram offers accounts the ability to disable or delete comments made on their posts. Influencers have at times chosen to disable the comment section on their posts immediately following a scandal. There has also been evidence of influencers deleting negative comments from their posts (Figure 7). These practices may result in more positive sentiment coming from comments which may not be entirely reflective of the true sentiment of consumers. To further this point, influencers may also choose not to post on Instagram for some time following a scandal; this choice may result in comments carrying a different sentiment than reflective of consumers' reactions to the scandal. It is likely that not all comments made on the Instagram posts following the scandal are related to the scandal. Another limitation is that all comments were weighted equally, regardless of how many likes it had or how many separate comments were made by its commenter. Future studies should address these limitations.

Future research on this topic may wish to examine how sentiment post-scandal changes longitudinally. This would require methodically pinpointing the exact date of the scandal and collecting data from posts made at different points in time following the scandal. Future studies

may also categorize the types of influencers (ex. beauty, fitness, lifestyle) and the types of scandals (ex. illegal activity, questionable business practices, prejudices) in order to measure how different categories may affect post-scandal sentiment differently.

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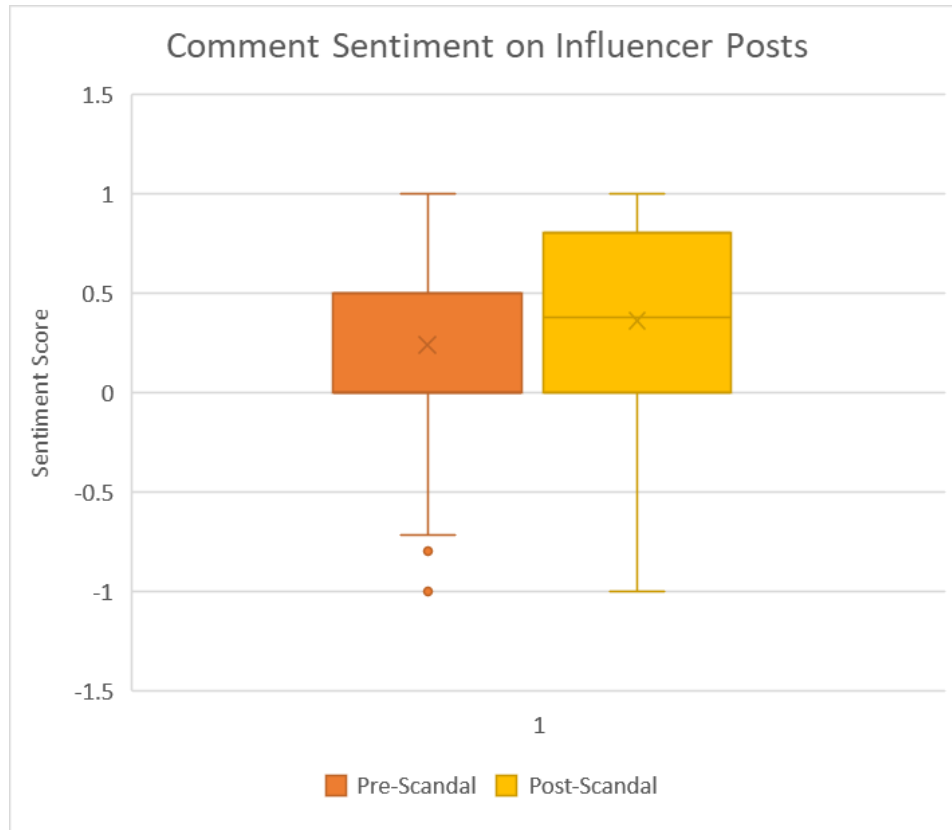
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## APPENDIX

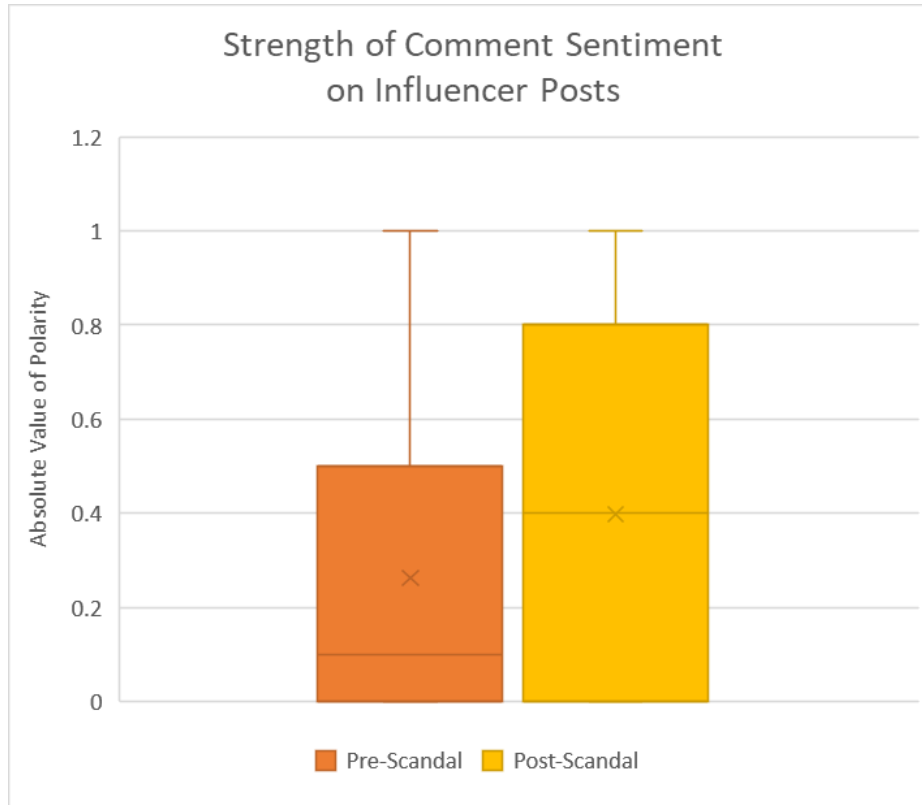
Original Comment: @larlarlee ❤️😁❤️ You look absolutely amazing!!!

Cleaned Comment: Look absolutely amazing

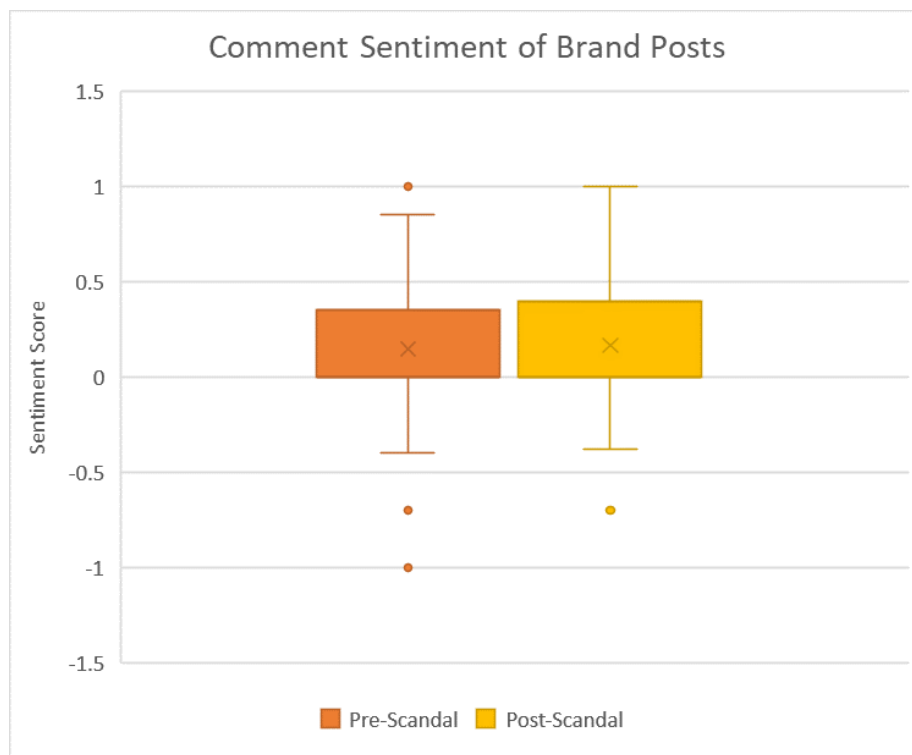
**Figure 1. Sample Comment Transformation**



**Figure 2. Comment Sentiment on Influencer Posts**

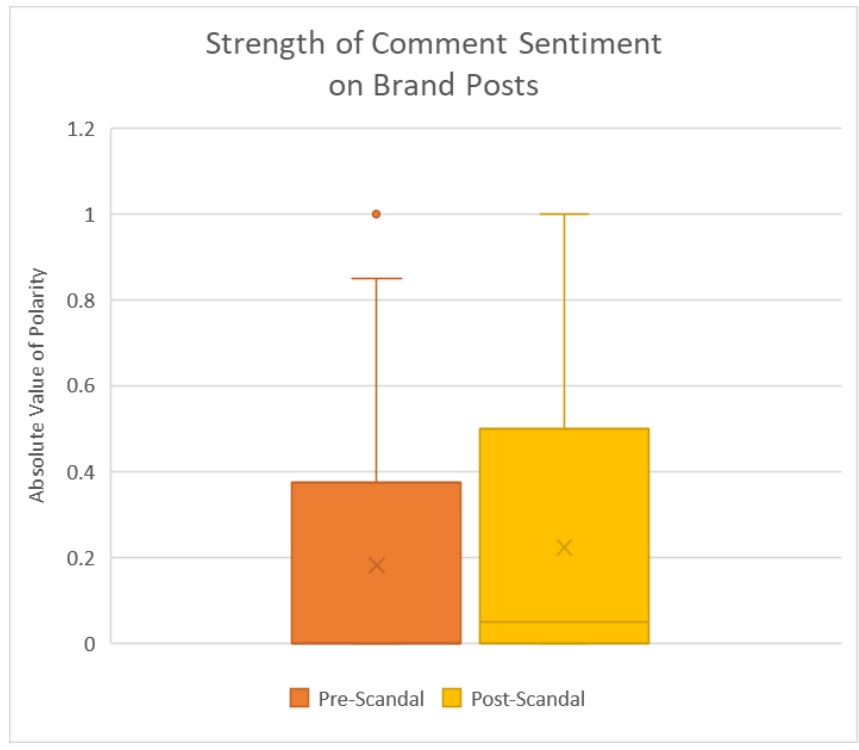


**Figure 3. Strength of Comment Sentiment on Influencer Posts**

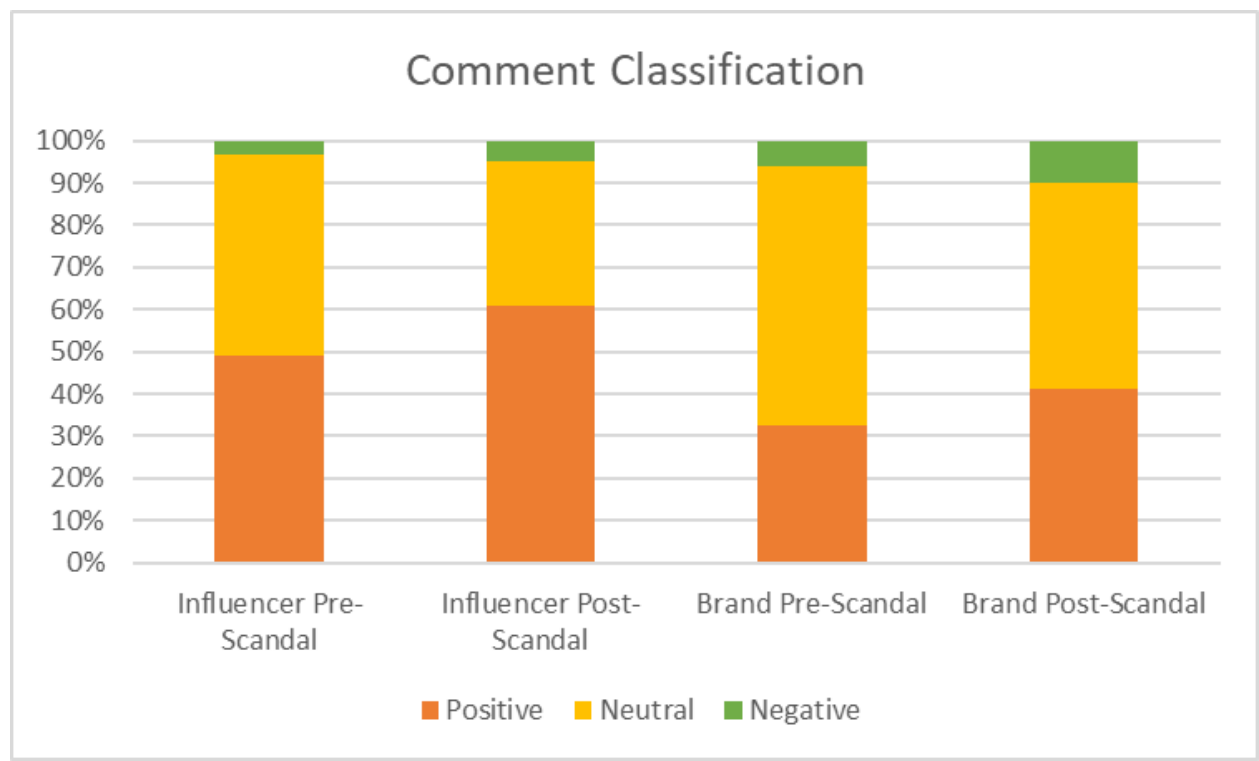




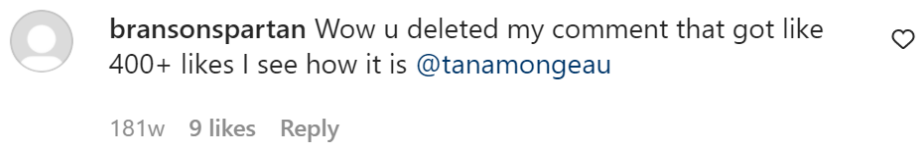
**Figure 4. Comment Sentiment on Brand Posts**



**Figure 5. Strength of Comment Sentiment on Brand Posts**



### Figure 6. Distribution of Comments by Classification



**Figure 7. A Comment Accusing an Influencer of Deleting Comments**