

Greenwashing and Brand Perception- A consumer sentiment analysis on organisations accused of greenwashing.

Abstract

This study focuses upon analysing public sentiment from data mining twitter posts, both before and after greenwashing accusations were proven against 8 established, well-known brands. The purpose of the exploration is to discover the extent to which greenwashing practice has a detrimental effect upon the consumer brand relationship. This effect is measured through customer comments via sentiment analysis. Applying data scraping techniques, data mining and sentiment analysis authors measured the differences in consumer sentiment and positioning towards brands during the greenwashing scandals. Findings revealed that most brands showed a reduction in Tweets post the greenwashing ruling. Through brand transgression theory, this could be interpreted as consumer avoidance, in short, less engagement with the brand, demonstrating disapproval. Negative sentiment increased in the Tweets analysed post greenwashing ruling for all brands, however, surprisingly, consumer trust with the brands was not altered and actually increased in the majority of cases.

Keywords: Greenwashing; Advertisement; Consumer; Social Media; Twitter; Data Mining; Sentiment Analysis; Brand Transgression.

1 Introduction

Public and government put pressure on enterprises to pursue an environmentally responsible agenda, resulting in increased adoption of green production processes or/and use of green marketing and branding strategies. Companies repeatedly communicate their products as environmentally friendly, green and eco-friendly and endeavour to persuade consumers and to ‘be green’ and to ‘save the planet’ through their online communications. Brands are galvanised to demonstrate environmental responsibility to the wider public as buying trends indicate that customers are more willing to pay a premium for sustainable products (Horton, 2022). Societal pressure demands brand accountability and transparency in their communications, however, the lack of clear demarcation of sustainability practices results in exaggerated green claims to be a growing issue of concern (Mukendi, *et al.*, 2020). If the organisation fails to practise the green behaviours claimed in its communications towards consumers, then greenwashing occurs (Akturan, 2018).

A definition of greenwashing is “*the creation or propagation of an unfounded or misleading environmentalist image*” (OED, 2022). Becker-Olsen and Potucek (2013) also define Greenwashing as *the practice of falsely promoting an organisation’s environmental efforts or spending more resources to promote the organisation as green than are spent to actually engage in environmentally sound practices*”. False messaging and misleading communications potentially have a detrimental impact on the level of trust between the brand and their consumers, negatively impacting purchasing decisions, consumer engagement and brand perception. There has recently been an exponential growth in media reports of high-profile brands accused of greenwashing (ASA, 2022). Therefore, this study aims to explore if there are changes in consumer sentiment towards a brand after it has been found guilty of greenwashing. The authors collect real time data on brand engagement pre and post greenwashing cases to discover the extent to which this practice has a detrimental effect on the consumer brand relationship or if at all. This effect is measured through customer comments via sentiment and brand engagement online. By doing so, the study aims to provide managerial implications to organisations to consider a new communication approach in the current age of sustainability. This is through contributing to a novel understanding of consumer sentiment by applying brand transgression theory to analyse the greenwashing impact on consumer engagement.

2 Literature Review and Background

Green marketing claims do not always equate with a firm's environmental conduct, a process described as “greenwashing” (Garfield [1991](#)). In short, this is projecting a caring image whilst operating without significant changes to harmful environmental practices. When environmental efforts are exaggerated by a firm, consumer confidence is undermined. Consumers become sceptical of firms that would exploit environmental trends for competitive gain (Pomering and Johnson [2009](#)). Siano *et al.*, (2017) suggests that greenwashing falls into two main categories; firstly, decoupling where organisations communicate statements and associations with green initiatives unlikely to occur or unsubstantiated. Secondly, attention deflection, which involves selectiveness in choosing content to be disclosed and presenting vague, inaccurate claims. For example, there are certain terms and phrases that are often

attributed to communications associated with greenwashing. Employing the word ‘eco’ is an example of misleading or vague communications, as proving an ‘eco’- strategy is challenging to prove for manufacturing and supply chains. Generally, mentioning “sustainable” in product communications suggests that the whole product contains sustainable materials, textiles or parts. An environmental claim could prove to be incorrect at some stage in the supply chain or operational activities. For example, products which are stated as being fabricated from recycled cotton or are deemed “organic”, when only a small portion of the whole item is made from green materials is misleading to consumers. Repeatedly, brand communications are labelled as greener or eco-friendlier (than previous offerings or competitor products) yet fail to provide the benchmarking information, brand and criteria and thus this practice is synonymous with greenwashing (Horton, 2022).

The principal offending industries of greenwashing are travel and transport, beauty, food, cleaning products and fashion and textiles. The UK government’s Competitive Markets Authority (CMA) discovered over 40% of marketing claims in these industries were misleading in their promotion of their sustainable products, results obtained after analysing 500 brand websites. Examples reported employed vague terms such as eco-friendly, natural or sustainable, without presenting any evidence to underpin the claims. Various brands created their own logos, presenting themselves as holding eco-friendly associations, yet without affiliation to accredited companies. Consequently, the same brands were omitting or hiding information relating to the pollution levels associated with certain products to present themselves as more eco- friendly (CMA, 2021).

2.1 Consumer brand engagement and sustainability

Understanding consumer opinion and changing sentiment towards a brand is the focal point of this study and explored by measuring consumer engagement online. Engagement has been researched extensively, discovering a correlation between higher levels of engagement and improved sales transactions, increased consumer value, stronger emotional connections, loyalty, commitment, trust and satisfaction towards brands. Engaged customers contribute to the marketing activities of an organisation, assist in brand referral processes and partake in co-creation on various platforms (Connell, et al., 2019). Islam & Rahman (2016) define consumer engagement as: *“The readiness of a customer to actively participate and interact with the focal object (e.g. brand/organisation/community/website/organisational activity), [which] varies in direction (positive/negative) and magnitude (high/low) depending upon the nature of a customer’s interaction with various touchpoints (physical/virtual)”* (p. 2019).

Social media has been found to be an effective tool used by marketers to assist in encouraging consumer engagement (Goh, Heng, and Lin 2013; Hanson, Jiang, and Dahl 2019; Harmeling et al. 2017; Sheng 2019). Digital marketing has evolved the channels of communication between consumers and brands developing innovative techniques to encourage sustained interaction (Barreto and Romalho, 2019). Initiatives are employed to drive customer engagement and to cultivate the psychological and emotional bonds (Meire, 2019). However, Pentina and colleagues suggest that the main goal of social network marketing is to quantify engagement and this presents challenges for ascertaining contributions obtained in comparison to alternative forms of promotion and advertising (Pentina, et al., 2012).

Customer engagement theory postulates that customer experiences with the brand impacts an individual's affective and emotional state, consequently influencing their brand perspectives they communicate on social media. This includes the essence of the sentiment whether positive

or negative when consumers discuss the organisations and brands on various platforms (Pansari and Kumar, 2017). Thus suggesting that if the customer has had a negative experience with a brand or organisation such as learning about greenwashing this may impact their valence towards a brand.

2.2 Social media, Customer sentiment and E-wom in green marketing

Consumers are reliant upon corporate communications as a major channel to inform their purchase decisions (Hamann and Kapelus, 2004). Brands are generally proactive in posting content online, however, the interaction is rarely one way, with consumers retorting an immediate response to a brand posting. Consumers are forthright in their opinions regarding brand experiences and conduct (Vander Shee, Peltier, & Dahl, 2020). Recent research discovered that customers decode different cues from the organisation's sustainable communications to work out the true motives for the brand's eco practices (Leonidou & Skarmeas, 2017; Skarmeas & Leonidou, 2013; Mende and Wieseke, 2018). Customers also refer to communications for a deeper understanding of the identity of the brand (Bhattacharya & Sen, 2003; Du et al., 2010). In order to regain consumer trust and influence environmentally friendly buying habits, digital marketing communications must be effective in alleviating uncertainty. Thus, the combination of sustainability and digital marketing communications can serve to mitigate risk and distrust in online buying behaviours (Diez-Martin, F. et al., 2019). Word of mouth on social media (EWOM) is crucial in gaining consumer trust in brands, as consumers are wary of a reliance on brand communications only (Kemp, 2022; Munir, 2020). Consequently, a brand who has been found greenwashing is vulnerable to consumer backlash as they vocalise discontent, alerting followers of the unethical behaviour, which could have a detrimental impact on purchase decisions (Zhang, 2018). Social media is an effective tool for increasing the volume and rapidity of communications to promote organisations green appeals and branding. Conversely, these tools can backfire with the same rapidity if the brand is guilty of insincere and unauthentic communications in its green strategies (Lopez-Quezada, 2018; Pittmann & Sheehan, 2020). The result can be customer confusion, negativity and a reduction in consumer confidence. For example, Amatulli, et al., (2020) found that when consumers were presented with information that a luxury fashion brand had been unsustainable in their practices they were more likely to post negatively online about the brand. Consumers post criticism on social media platforms blaming and shaming brands for greenwashing. Subsequently, brands attempt to appease consumers by developing new brand logos, brand names and product offerings (Schmitt, Brakus, and Biraglia, 2021). Despite extant literature assuming that greenwashing can encourage negative eWOM amongst consumers on social media (Zhang, 2018) a positive outcome for the brand is that they can glean valuable and insightful feedback from consumers to improve future practices (Agnihotri et al., 2012; Vander Shee, Peltier, & Dahl, 2020).

Customer sentiment, considers the positive and negative essence of consumer perspectives, including the analysis of consumer reactions in response to brand communications presented online. Comments, feedback and reactions towards the brand's content is scrutinised in relation to the orientation within the opposing positive and negative forces, thus, encouraging understanding of the richness of engagement that exceeds likes and sharing (Meire et al., 2019). Content analysis of consumer sentiment benefits product innovation and services and assists reformulation of future digital strategies for brands (Roy et al., 2019). One study focusing on multinational brands including Nike, Coca-Cola and Amazon found that positive sentiment can have a higher impact on an audience's brand awareness than negative sentiment and contributes

to consumer purchase intention (Colicev et al. 2018). Research demonstrates that data extracted from sentiment analysis is an effective way to measure consumer engagement patterns and behaviour on social media (Vander Shee, Peltier, & Dahl, 2020) and will therefore be adopted for this study.

2.3 Sustainability advertisements greenwashing (famous examples)

Certain established brands have faced criticism over greenwashing practices in their products and communications. For example, in 2019, H & M launched a line of clothing deemed to be 'green' and "sustainable", named 'Conscious'. The clothing line was promoted as being fabricated from recycled polyester and organic cotton, communications stated "*Shop our selection of sustainable fashion pieces that make you both look and feel good*". (Robinson, 2022). Statements were vague relating to the sustainability of the products and were reported to be misleading due to the lack of legal criteria that has to be fulfilled to ensure that a product is deemed sustainable (Robinson, 2022). The limited information available about sustainable issues coupled with previously superficial, flexible laws can have a negative impact upon stakeholders. Specifically, the internal and external factors involved in running organisations including customers, competitors, trends and discount strategies can often encourage the temptation for organisations to greenwash (Batista, de Oliveira, & de Lima, 2020). Additionally, the notorious example of the Volkswagen Group, which falsely advertised non-polluting diesel cars, demonstrates that greenwashing ranges from small scale exaggeration to a complete production fabrication, the latter being the case for Volkswagen. The cars in question had 'defeat devices' in their diesel cars which produced more than 40 times nitrogen oxide than was legally allowed (Batista, de Oliveira, and de Lima, 2020). Volkswagen were accused of false advertising and false disclosure of information costing the company 25 billion in fines. Before the scandal broke Volkswagen was the 18th most valuable brand and post scandal they dropped down to 25th losing brand trust with previous loyal customers, showing the drastic negative implications the media exposure of greenwashing can have (Colvin, 2020).

2.4 ASA and sustainability (regulations)

Advertising guidance has been developed by the ASA for both non-broadcast and direct marketing activities (CAP) and broadcast advertising (CAP) to assist media owners, agencies and advertisers in developing regulated communications (ASA, 2022). The rationale for the recent focus and crackdown on sustainability adverts by the ASA is due to the strict UN climate goals that have been set to be achieved by 2030 (Cockburn, 2021). The codes provide guidance, such as; ensuring the marketing claims are based on quantifiable information, using clear (and not misleading) terminology in their communications, and presenting evidence if greener or eco-friendly terms are used. The statements or claims should include the full product lifecycle to justify the sustainability messages are evidence based, and scientific opinion should not be divided but factual (ASA, 2022). Greenwashing is a prevalent issue, which demands curtailing. Hence, the government responded by introducing a Green Claims Code in 2021, focusing on six key principles underpinned by existing laws. The code corresponds with the ASA codes to ensure that organisations cover the full manufacturing cycle in their communications strategies, and avoid the exclusion or omission of vital environmental information, for example, pollution levels for the fabrication of the product (CMA, 2021). Despite this clarity in greenwashing regulations, established brands continue to defy the rules leaving themselves susceptible to legal cases and negative consumer opinions.

2.5 Sustainability advertisements in this research

This study will investigate several high-profile cases of greenwashing that have been upheld by the ASA with regards to customer sentiment and engagement. The brands accused are as follows:

Innocent Smoothies

Innocent smoothies were found to have presented misleading environmental messages whereby they encouraged their audience to “*get fixing up the planet*”. The ASA watchdog stipulated, “*that they did not demonstrate that their products had a net positive environmental impact over their full life cycles*”. Furthermore, Innocent’s environmental claims did not equate in real terms to physically doing anything to save the planet at that point in time, as a future goal had been proposed to ensure 70% of their bottles were recycled by 2023 and to be carbon neutral by 2030 (Gregory, 2022).

Ryan Air

In 2019 RyanAir, one of the UKs biggest airlines released advertisements that stated “*Europe’s Lowest Fares, Lowest Emissions Airline* ” with a key message that they had low CO2 emissions. The complaint was upheld due to the fact that airlines in general do not have low emissions, and as a result RyanAir messaging was deemed as unsubstantiated and misleading to consumers (Sweney, 2020).

Oatly

Oatly, the oat milk drink substitute was convicted of green washing in 2021 after they presented advertisements with a campaign that stated “*Need help talking to dad about milk?*”. The purpose of the advertisements were to compare dairy milk with Oatly milk, or vegan diets versus omnivore diets (BBC, 2022). The campaign included statements such as “*Oatly generates 73% less CO2e vs. milk, calculated from grower to grocer*”. This was deemed a misleading statement only comparing findings to whole milk and not other variations. The evidence on their website was insufficient to support the claims made. Oatly advertisements included further messages on the impact of greenhouse gases from the environmental impact from eating meat and dairy which were found to also be misleading and unsubstantiated (ASA,2022).

Alpro

Alpro, the almond milk drink company, was censored in their advertisements for stating the almond based drink is ‘*good for the planet*’. The complaint made against the company challenged the fact that almond farming can also cause environmental damage. Even though it was found that the almonds sourced were not from areas that caused significant impact to the environment, the ASA ruled that this was misleading for consumers. A statement such as ‘*better for the planet*’ would have been more reflective of the true practices of Alpro (Selwood, 2021).

Quorn

Marlow foods Ltd., the company behind Quorn, released an advertisement for their Quorn Thai Wondergrains product. Their promotions suggested that by consuming their product, customers

would reduce their carbon footprint and have a positive impact on the environment. This included the statement: *"Quorn Thai Wonder Grains is a step in the right direction because it helps us reduce our carbon footprint and that's got to be good."* (Degun, 2020). The ASA ruled that the basis of these environmental claims was not substantiated and this could be misleading despite them stating they have a Carbon Reduction Footprint certificate from the carbon trust (ASA, 2020).

Lipton Ice Tea

An advertisement for Lipton Iced Tea that was released in August 2021 had the headline stating *"Deliciously refreshing, 100% recycled"*. In the small text at the bottom of the advertisement it read *"Bottle made from recycled plastic, excludes cap and label"*. Hence, this was not 100% recycled as claimed. This was displayed by two bottles in the imagery with a logo that said *"I'm 100% recycled plastic"* (Fulton & O'Donnell, 2022). The complaints were upheld by the ASA who ruled this as misleading and there was a lack of clarity in qualifying the claims made (ASA, 2022).

Hyundai

In January 2021 Hyundai released communications promoting the new version of their vehicle released on the market, called the Nexo. The statement claimed *"A car so beautifully clean, it purifies the air as it goes"*. Despite a reduction in exhaust fumes, the vehicle still released particles from the brakes and tyres which can have significant environmental impact, leading to unsubstantiated and misleading environmental claims (Shankleman, 2021; ASA, 2021).

Shell

Shell's statement in their communications *'drive carbon neutral'*, was found to be misleading as Shell's motives were to sell a loyalty scheme, whereby Shell would offset the carbon emissions only for their loyalty customers. This would then be offset into future schemes such as nature projects including tree planting. However, this was not clear as it was presented in a way as if they were stating that their fuel had zero carbon emissions which was not the case and the complaints were upheld by the ASA (ASA, 2020).

2.6 Brand transgression

The brand-consumer relationship can be positively or negatively impacted by actions taken by either party. Specifically, on the negative side the communion can be impaired if actions violate the rules and regulations that dictate the relationship, which can be defined as transgression (Montgomery, Raju, Desai, and Unnava, 2018). Extant literature suggests that transgressions potentially have irreversible consequences on a customer-brand relationship and can affect brand performance (Aaker, Fournier, & Brasel, 2004; Gregoire, Tripp, & Legoux, 2009). If the brand's actions do not coincide with expected behaviour, the rules of the alliance can be broken, thus engendering a detrimental impact on consumer brand and resulting in a deterioration or complete breakdown of the relationship (Hemonnet-Goujot, Kessous, and Magnoni, 2022). Consequently, it is important for research to understand consumer perceptions towards transgressions taking into consideration the relationship prior and post the violation of the rules (Montgomery, Raju, Desai, and Unnava, 2018). Inconsistent responses to brand transgressions from consumers exist as predictability is not evident, subsequently presenting difficulties for marketing managers to understand the true impact of transgressions. Without insights of this

kind it becomes more challenging for brands to cultivate committed and long-lasting relationships with their customers (Aaker, Fournier, & Brasel 2004). This study will consider brand transgression theory to accurately understand the impact of consumers' sentiments measured by online engagement and responses towards brands after they have been found guilty of greenwashing.

3 Methodology

Brand related communications were analysed for this study focusing specifically on organisations recently accused and reported for greenwashing, as verified by the ASA (ASA, 2022). The brands included Innocent Smoothies, Ryan Air, Oatly, Alpro, Quorn, Lipton Iced Tea, Hyundai, and Shell. Messages were analysed directly before the greenwashing claims and directly after the ASA ruling to explore potential differences in consumer sentiment. The communications were examined and observed via social media analytics techniques, namely scraping and data mining on the Twitter platform. Specifically, text mining was conducted, which is a form of 'content-based analysis' (Gandomi and Haider 2015) consisting of the retrieval of keywords in Tweets (Felbermayr and Nanopoulos 2016; Nam et al. 2017). Sentiment analysis anchors the text mining processes with the objective of labelling data on social media from the emotions portrayed by the author of the post and content (Calheiros et al. 2017). The individual brands' tweets were analysed to examine users' sentiment, pre and post greenwashing accusations. The data mining process was conducted using the procedure by He, Zha and Li (2013), which provides a three-stage process. Firstly, data collection, secondly pre-processing and finally, sentiment analysis. Figure 1 presents the processes of the text mining used in this study. The sentiment included in the Twitter messages for this analysis were reported as positive, negative and neutral, corresponding to previous similar studies analysing sustainability social media communications in another field (Zhang, Chintagunta & Kalwani, 2021). According to Stieglitz et al. (2018) social media analytics follows four main steps including discovery, tracking, preparation and analysis, which were considered throughout this procedure. R studio and data text mining coupled with TwitterR and Twitter API for coding procedures were adopted, allowing for the connection to the Twitter platform. To scrape the data, Twitter API V2 was implemented to initially search for the Tweets associated with the named brands three months before the reported greenwashing incidents and three months after the formal ruling from the ASA. The Tweets were mined and analysed in accordance with both sentiment analysis and considering consumer engagement. Consumer engagement was investigated through the amount of comments before and after the greenwashing incidents.

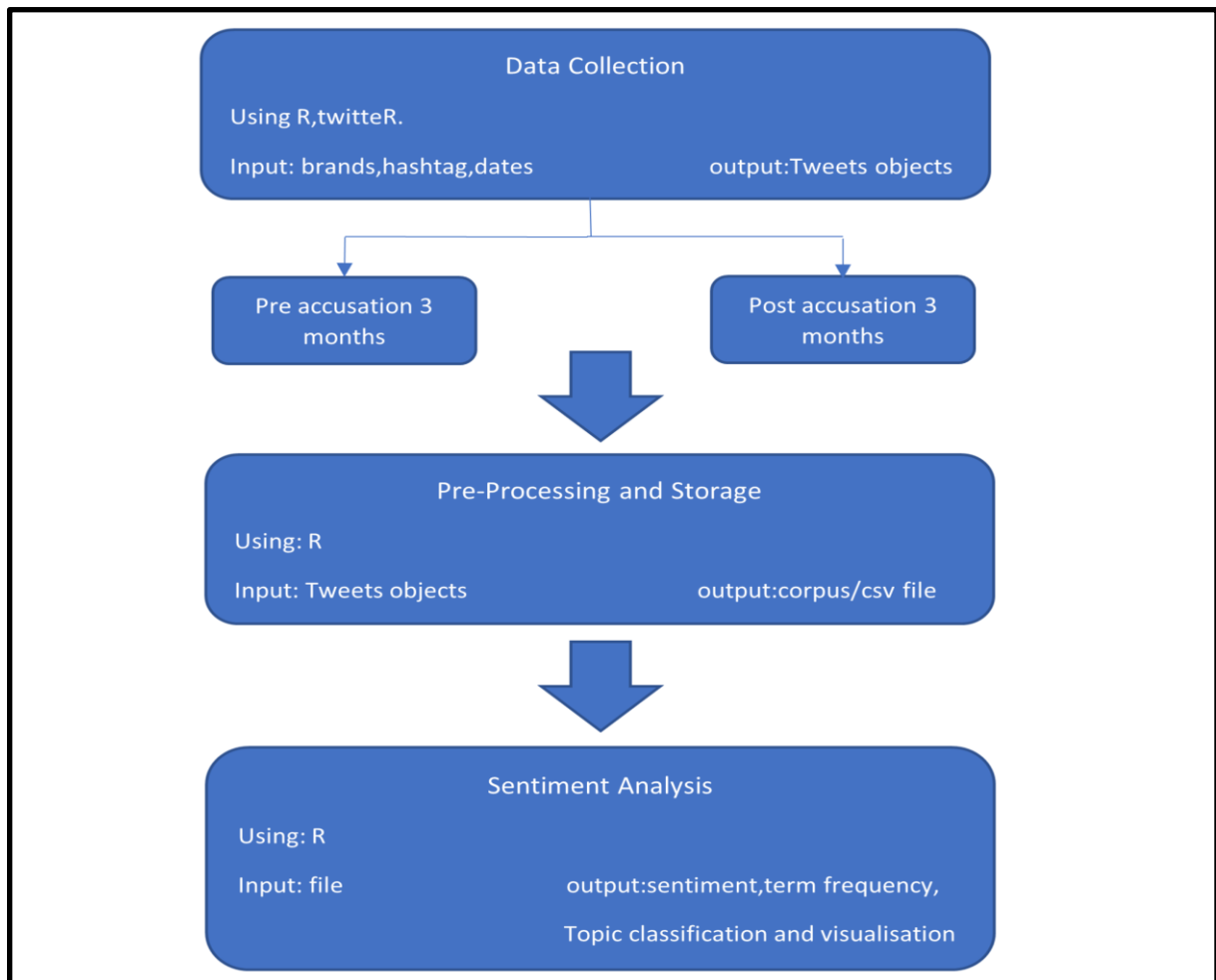


Figure1: Text Mining Process.

3.1 Data Source

Twitter is an ideal platform for text-mining analysis due to the popularity of the platform. Recent figures show that there are 18.4 million UK users and 206 million monetizable global users (Statista, 2022). Twitter is the second most popular social media platform in the UK with 23.8% share of the market and is within the top 7 most popular platforms (Statista, 2021). The platform is frequently utilised by brands to enhance brand image and personality through continuous conversation-based communications, broadcasted to extensive communities at a low cost. Brands are able to profile customers on Twitter, through features displaying followers, number of followings and their content and insights that could enhance advertising campaigns (Dahka et., al.,2020). On the audience side, consumers have been found to use Twitter frequently for conducting brand research (Beveridge, 2022). Twitter contains untapped knowledge sources and is influential in influencing social, economical and political directions and was therefore adopted for this study. The timeline for all brands was kept recent between 2019 and 2022 depending on when the incident occurred for each brand. A timeline is shown in table 2 below.

Brand	Greenwashing Incident Timeline	Twitter Handler	Followers/Tweets
Innocent Smoothies	Advert-May 2021 ASA ruling- Feb 2022 https://www.asa.org.uk/rulings/innocent-ltd-g21-1111827-innocent-ltd.html	@innocent	299.9k Followers 140.4k Tweets
Ryan Air	Advert- September 2019 ASA ruling- 5th Feb 2020 https://www.asa.org.uk/rulings/ryanair-ltd-cas-571089-p1w6b2.html	@Ryanair	561.k Followers 284.3k Tweets
Oatly	Advert- 16th Jan 2021 ASA ruling- 26th Jan 2022 https://www.asa.org.uk/rulings/oatly-uk-ltd-g21-1096286-oatly-uk-ltd.html	@OatlyUK (not fv)	14.5K Followers 17.8Tweets
Alpro	Advert- 18th October 2020 ASA ruling- 20th October 2021 https://www.asa.org.uk/rulings/alpro--uk--ltd-a20-1081249-alpro--uk--ltd.html	@Alpro	61.7K Followers 44.8K Tweets
Quorn	Advert- April 2020 ASA Ruling- 30th September 2020 https://www.asa.org.uk/rulings/marlow-foods-ltd-g20-1061634-marlow-foods-ltd.html	@QuornFoods	29.2K Followers 25.7K Tweets
Lipton Ice Tea	Advert- 13th August 2021 ASA Ruling- 19th January 2022 https://www.asa.org.uk/rulings/pepsi-lipton-international-a21-1120048-pepsi-lipton-international.html	@Lipton	59.2K Followers 37.4K Tweets
Hyundai	Advert- 30th January 2021 ASA- 9th June 2021 https://www.asa.org.uk/rulings/hyundai-motor-uk-ltd-a21-1096716-hyundai-motor-uk-ltd.html	@Hyundai_UK	35.2K Followers 15.7k Tweets

Shell UK	Advert- January 2020 ASA- 8th July 2020 https://www.asa.org.uk/rulings/shell-uk-ltd-g20-1049869-shell-uk-ltd.html	@Shell_UKLtd	20.6K Followers 1023 Tweets
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Table 2: Brands Twitter and Accusation Dates

3.2 Data Collection

The first step in the data mining process is the data collection process which is divided into two sub-processes. Firstly, data collection before the brand greenwashing accusation and secondly, data collection after the brand accusation. The timeline of the data collection from the tweets was over a 3-month period. For example, the Innocent smoothie accusation was Feb 2022, then the pre-data was between November 2021 and January 2022. Whilst the post data will be from Feb 2022 to May 2022. The pre-data collection focused on the user's engagement with the brand, focusing upon mentioned tweets while the post data collection targeted the brand mention. Below are the queries provided to the Twitter API used for the data collection.

Query Example:

Before:

search?q=(@innocent) until 2022-01-31 since A2021-11-01&src=typed_query

After

search?q=(@innocent) until 2022-05-24 since 2022-02-01&src=typed_query

3.3 Pre-Processing and Storage

After collecting the raw data (tweets), the second step was to filter the text that is known as text cleaning. The data were prepared and cleaned before being used in the analysis. The set of cleaning actions/processes were applied:

- Remove of stop words, punctuations and numbers from the dataset
- Convert to text to lower cases
- Remove URLs
- Replacing emoticons by a word for example “:)” replaced by “smiley face”
- Applying tokenization at tweets level to separate the data

The resulting process produced a file (corpus) with a table containing columns as variables and rows as observations which in this case were tweets.

3.4 Sentiment Analysis

Once the cleaning and tidying of the data was completed, sentiment analysis was applied to discover the sentiment of the tweets (pre and post accusation). Sentiment analysis functions in extracting knowledge or understanding of user intention or emotion; sentiment focuses on extracting emotions from online text (Liu, 2012; cited by Meena and Barney, 2018). Sentiment analysis has an advantage of collecting and analysing comments in real time (Meena and Barney, 2018). Scholars have previously identified two approaches of sentiment analysis: 1-Supervised approach and 2-Unsupervised approach. With the supervised approach, the process relies on machine learning and AI to perform data collection, pre-processing, training and classification. The unsupervised approach, or lexicon analysis, determines the sentiment based on the orientation of the text (Jurek et al., 2015). Use of a dictionary containing positive and negative words is associated with the lexicon analysis to analyse the text, in our case the tweets. The paper used lexical analysis to conduct the sentiment analysis using R package tidytext containing large set lexicon phrases.

4 Findings

Before

The findings were conducted based on the collected data sets for the chosen brands listed in Table 2. The data of each of the brands before the greenwashing accusation were analysed and the data of the 3 months period after the greenwashing accusation were collected. Table 3 displays the collection periods for pre and post accusation.

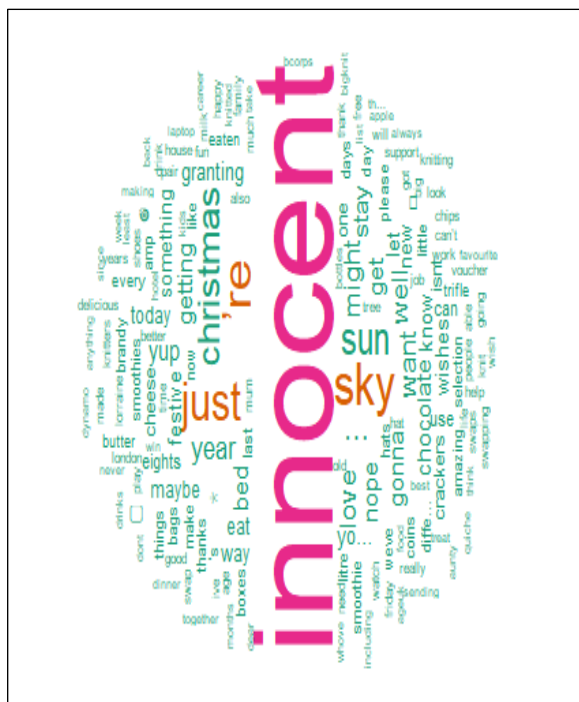


Figure 1: word cloud innocent.

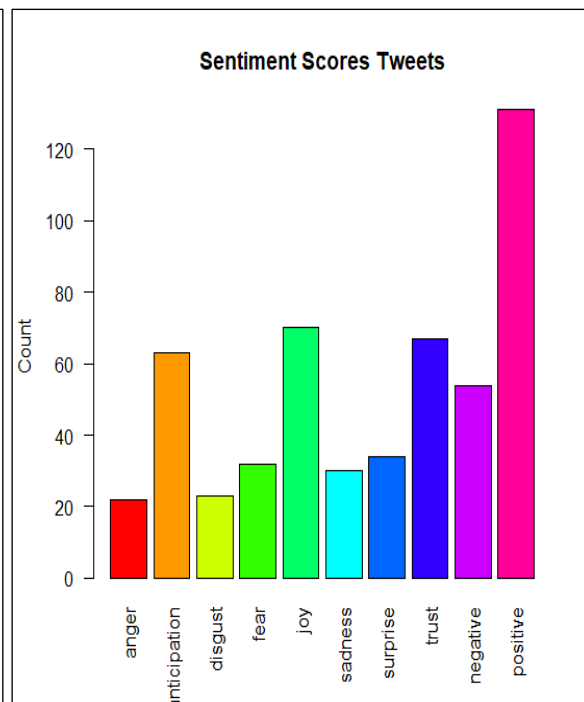


Figure 2: sentiment analysis innocent before

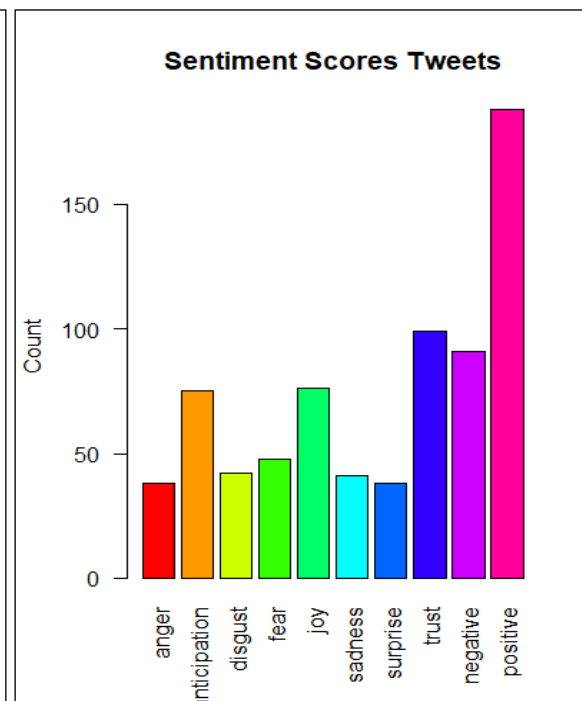
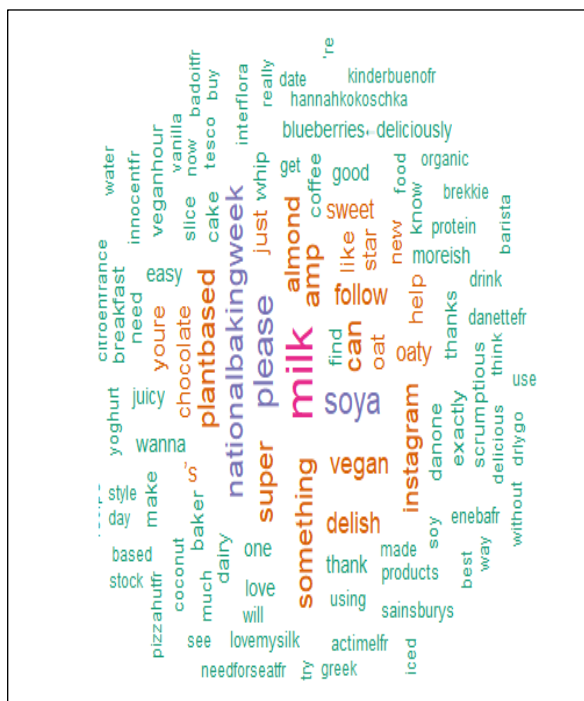
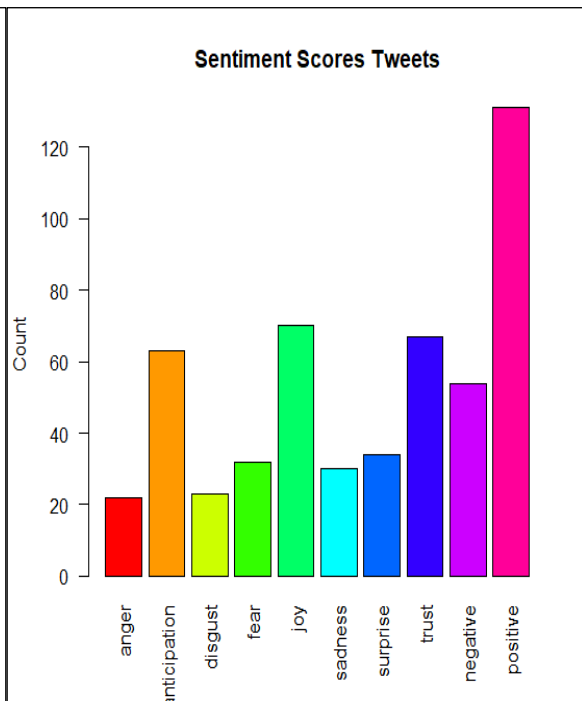
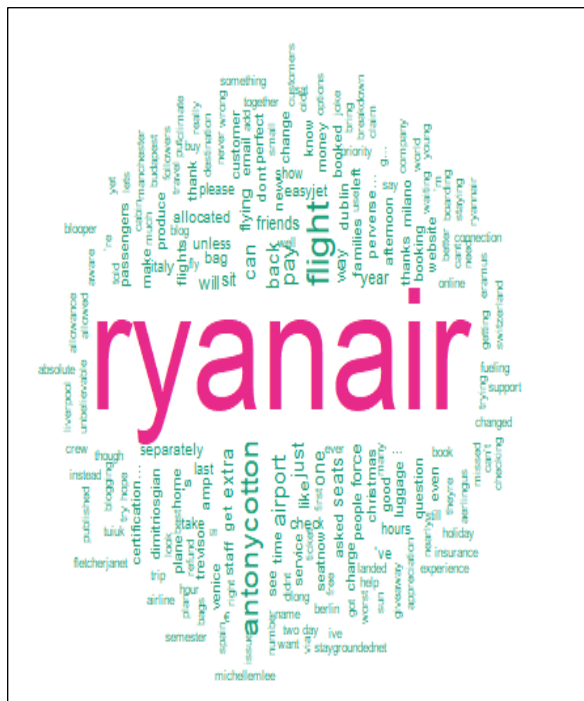




Figure 7: Word cloud Oatly before.

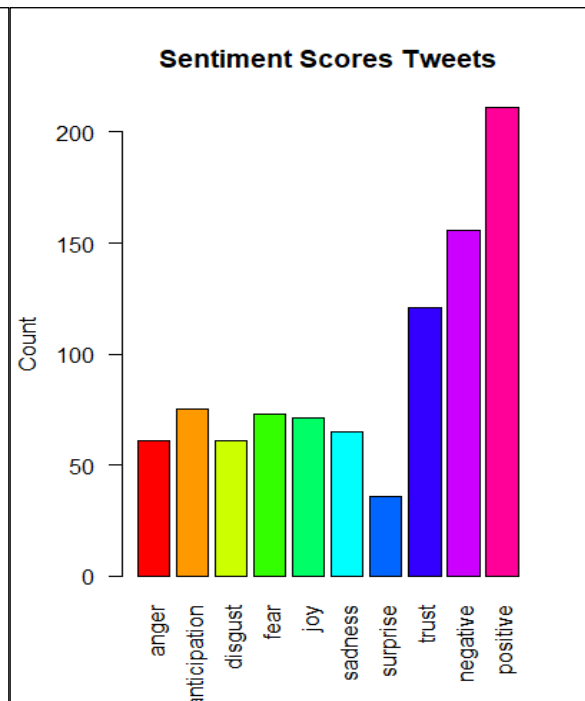


Figure 8: Sentiment Analysis Oatly before



Figure 9: Word cloud Quornfood before.

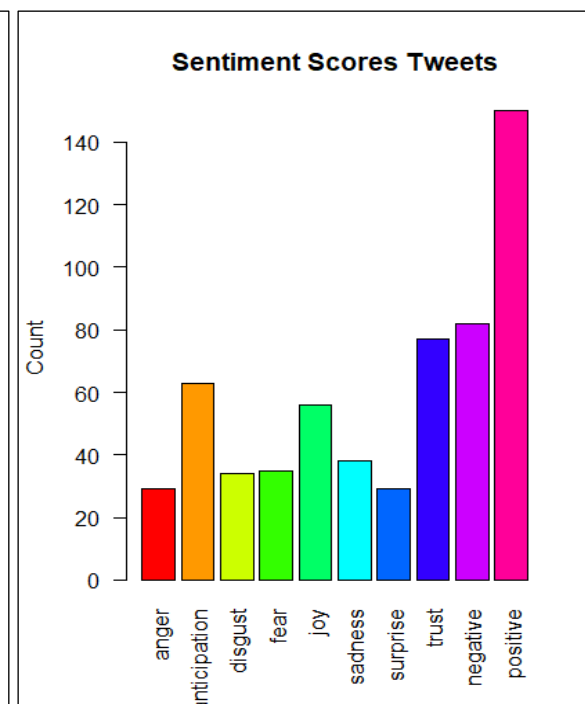


Figure 10: Sentiment Analysis Quornfoods before



Figure 11: Word cloud Lipton before.

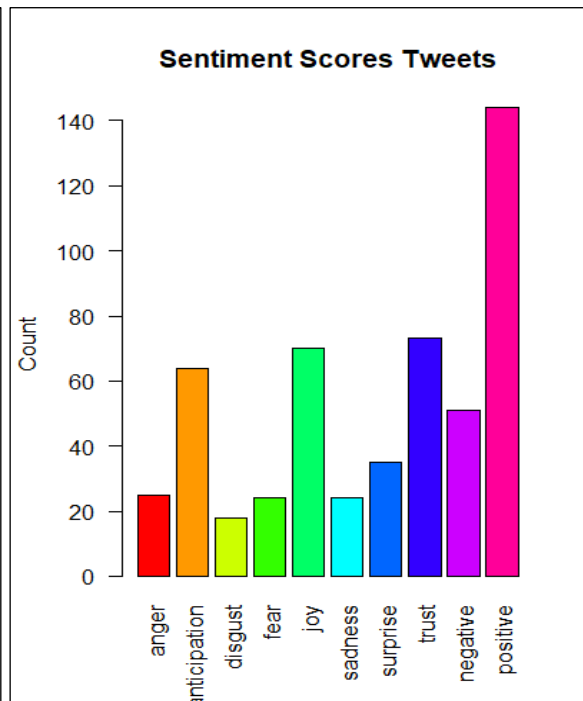


Figure 12: Sentiment Analysis Lipton before.

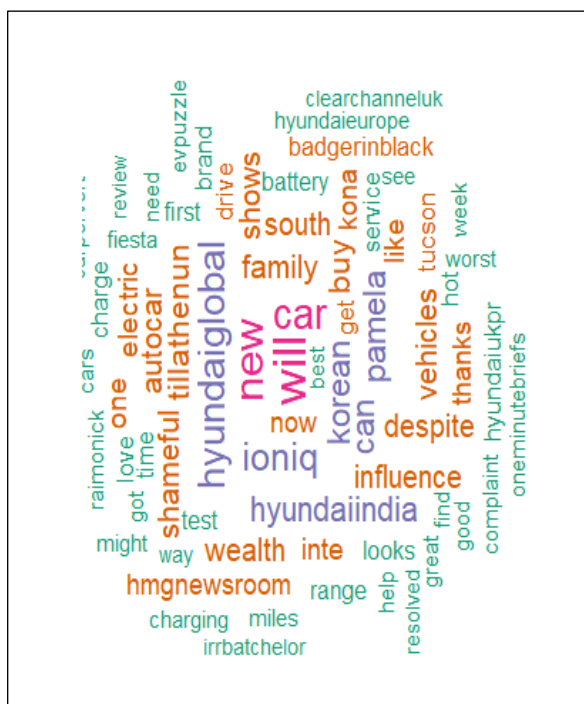


Figure 13: Cloud word Hyundai before

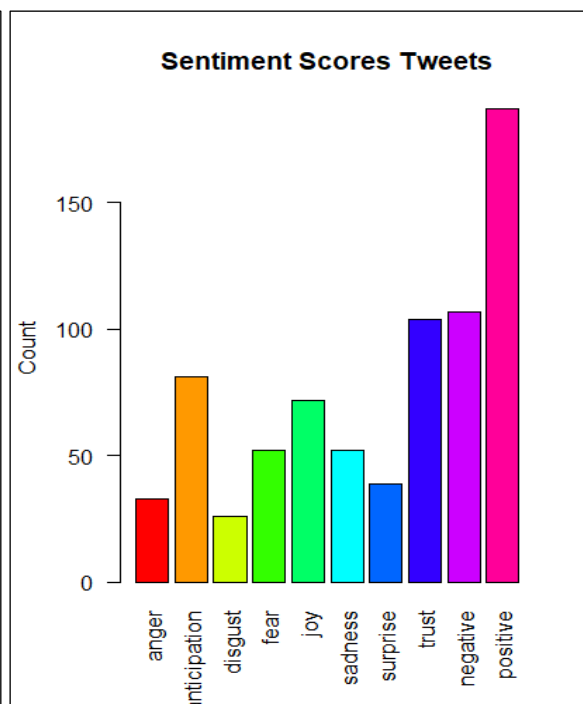


Figure 14: Sentiment Analysis Hyundai before.

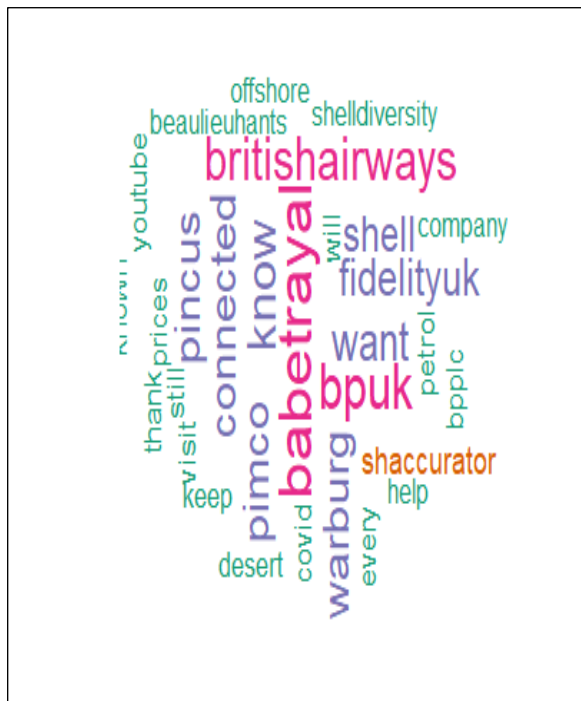


Figure 15: Word Cloud Shell before.

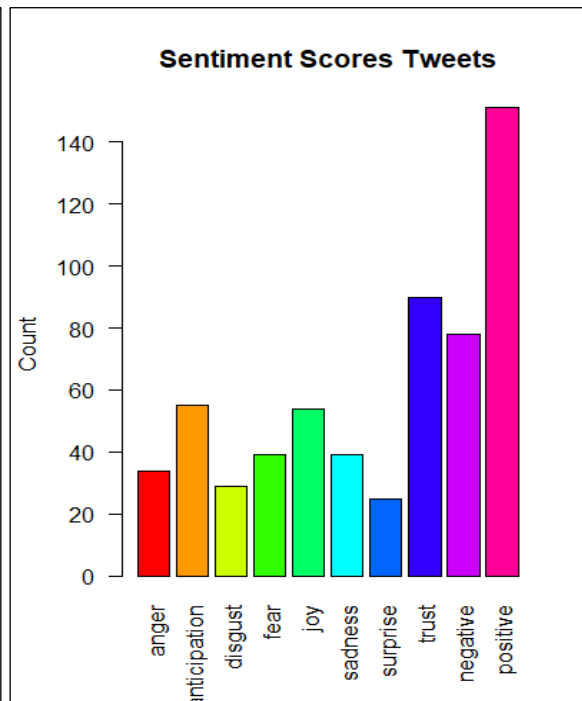


Figure 16: Sentiment analysis Shell before

After 3 Months

The second stage of the analysis was to gather the tweets after the brand was found guilty of greenwashing in advertisements by the ASA. As the most recent brand to be accused in greenwashing was Innocent drinks with the date of accusation in Feb 2022, we kept the duration of 3 months to make sure we have consistency across the brands. The data was collected by mining the tweets using the brand mention.

For Innocent drinks the data duration was between 02-02-2022 and 30-04-2022 with total tweets equal to 490. The tweets showed a high frequency of particular words such as ‘free’ when mentioning Innocent. Also, words such as ‘greenwashing’, ‘plastic’ and ‘guilty’ were used in the tweets. Figure 17 presents the word count after the 3-month period. The sentiment analysis showed some negative aspects of anger among the tweets but mainly showed positive sentiment. Figure 18 shows the nrc sentiment plot.

Furthermore, the RyanAir data was collected within a 3-month period after the accusation. The tweets collected between 05-02-2020 and 30-04-2020 with a total of 300 tweets. The data showed a high occurrence of words such as ‘cancel’ and ‘refund’. Figure 19 presents the word cloud for RyanAir after 3 months. Moreover, sentiment analysis conducted on the tweets collected showed an overall equal positive and negative sentiment. Figure 20 shows the sentiment plot for RyanAir after the accusation.

The next brand analysed was Alpro, the data of the 3 months period after the advert accusation were collected between 20-10-2021 and 20-01-2022. The total number of tweets (excluding retweets) with mention of @Alpro was equal to 491 tweets. The analyses of tweets showed a high occurrence of words with the brand name such as milk, plant based and switch. Figure 21 presents the word cloud for the collected tweets. The sentiment analysis using the nrc function

showed that the sentiment is positive with the brand. Figure 22 presents the sentiment analysis plot.

Similarly, the next brands analysed were Oatly and Quornfoods. The data of the 3 months period for Oatly after the advert accusation were collected between 25-01-2022 and 25-04-2022. The total number of tweets (excluding retweets) with mention @Oatly was equal to 564 tweets. The analyses of tweets showed a high occurrence of words with the brand name such as milk, tesco and vegan. Figure 23 presents the word cloud for the collected tweets. The sentiment analysis using the nrc function showed that the sentiment is highly positive with the brand. Figure 24 presents the sentiment analysis plot. Moreover, another brand Quorn Food that operates within the food and drinks was analysed. The data of the 3 months period after the advert accusation were collected between 30-09-2020 and 30-12-2020. The total number of tweets (excluding retweets) with mention @QuornFoods was equal to 394 tweets. The analysis of tweets showed a high occurrence of words with the brand name such as vegan, backquorn and veganuary. Figure 25 presents the word cloud for the collected tweets. The sentiment analysis using the nrc function showed that the sentiment is highly positive with the brand. Figure 26 presents the sentiment analysis plot. In addition to these brands (Oatly and Quorn Foods) another brand in the food and drink sector which is Lipton was analysed. The data of the 3 months period after the advert accusation were collected between 19-10-2022 and 19-04-2022. The total number of tweets (excluding retweets) mentioning @Lipton was equal to 398 tweets. The analyses of tweets showed a high occurrence of words with the brand name such as tea, unhuman rights and sdg action. Figure 27 presents the word cloud for the collected tweets. The sentiment analysis using the nrc function showed that the sentiment is highly positive with the brand. Figure 28 presents the sentiment analysis plot.

On the other hand, brands that related to petrol and motoring (Shell and Hyundai) were analysed. Brand Hyundai tweets were collected for the 3 months period after the advert accusation between 09-06-2021 and 09-09-2021. The total number of tweets (excluding retweets) with mention @Hyundai_UK was equal to 582 tweets. The analyses of tweets showed a high occurrence of words with the brand name such as car, biggest and hyundaiukpr. Figure 29 presents the word cloud for the collected tweets. The sentiment analysis using the nrc function showed that the sentiment is positive with the brand. Figure 30 presents the sentiment analysis plot. Similarly, the brand Shell related to petroleum was analysed. Brand tweets were collected for the 3 months period after the advert accusation between 09-07-2020 and 09-10-2020. The total number of tweets (excluding retweets) with mention @Shell_UKLtd was equal to 456 tweets. The analysis of tweets showed a high occurrence of words with the brand name such as greenwashing, shellslies and oil. Figure 31 presents the word cloud for the collected tweets. The sentiment analysis using the nrc function showed that the sentiment is still positive with the brand. Figure 32 presents the sentiment analysis plot.

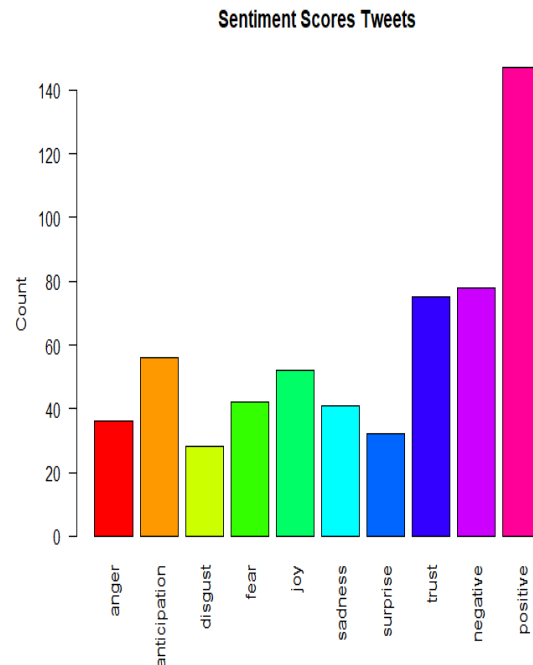


Figure 17: Word cloud innocent after 3 months.

Figure 18: Sentiment plot Innocent after 3 month.

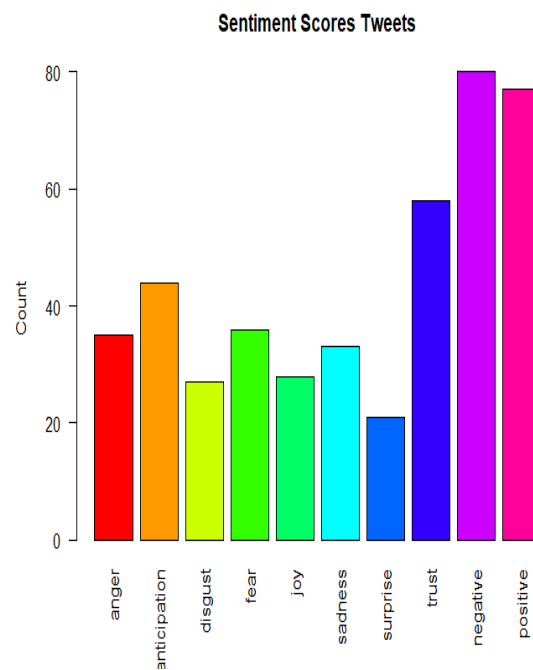
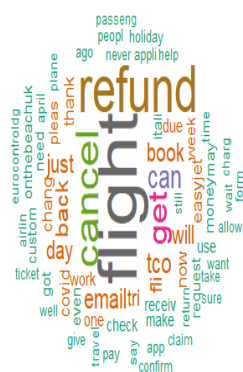


Figure 19: Word cloud RyanAir after 3 months.

Figure 20: Sentiment RyanAir after 3 months.



Figure 21: Word cloud Alpro after

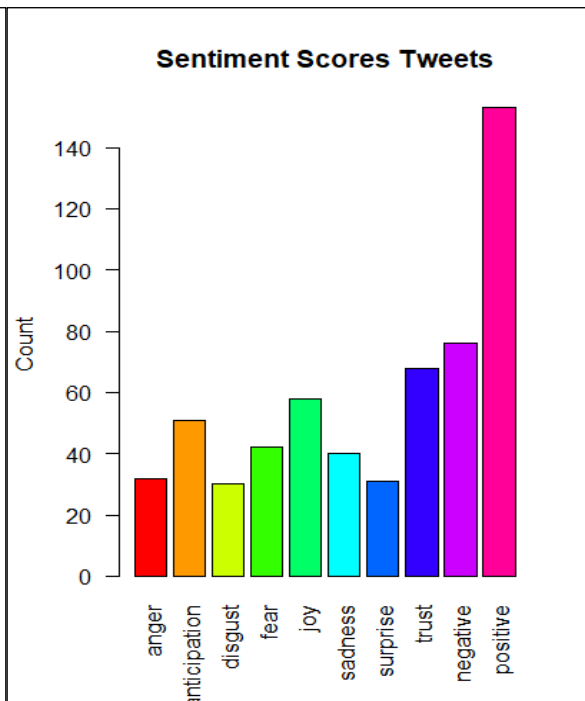


Figure 22: Sentiment Analysis Alpro after.

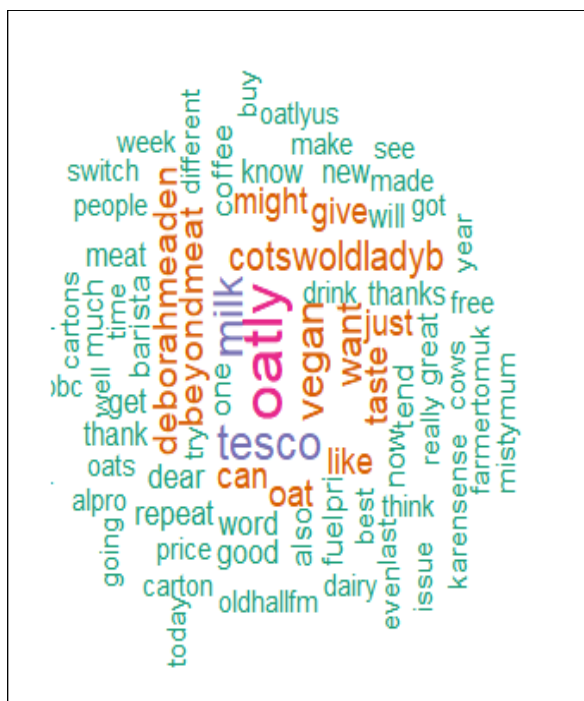


Figure 23: Word cloud Oatly after.

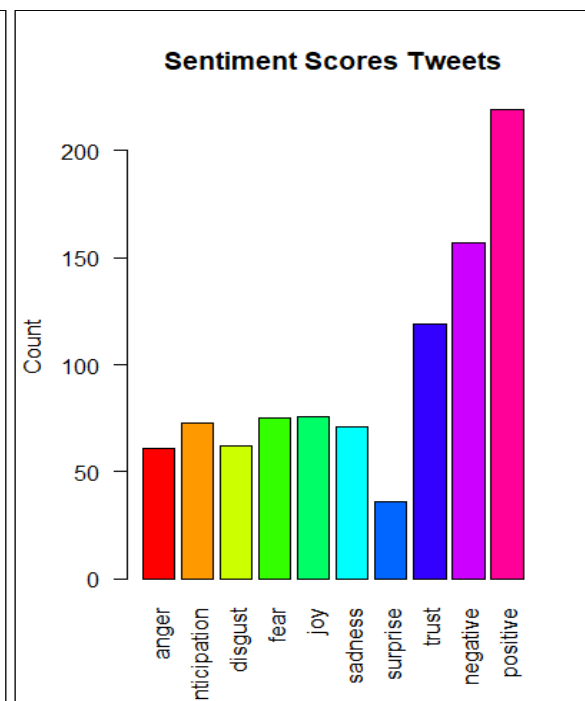
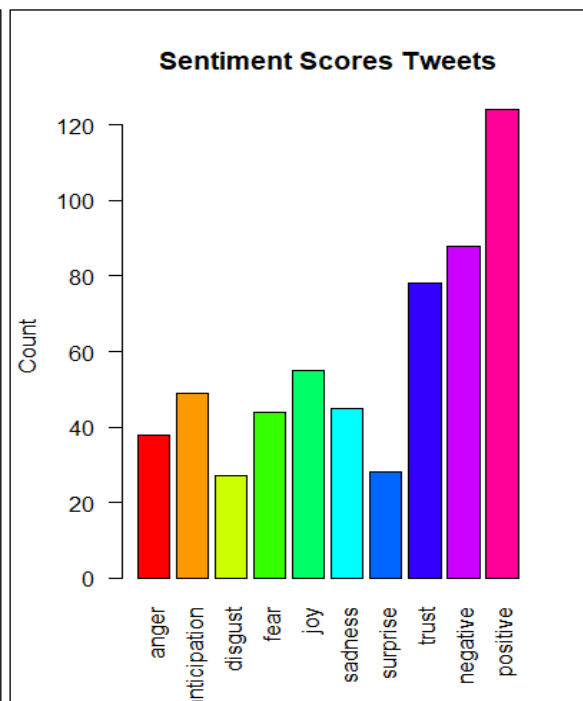
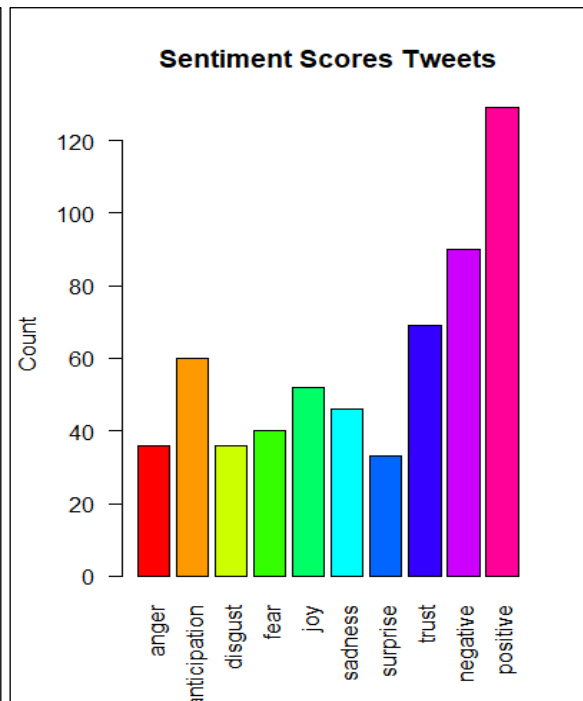
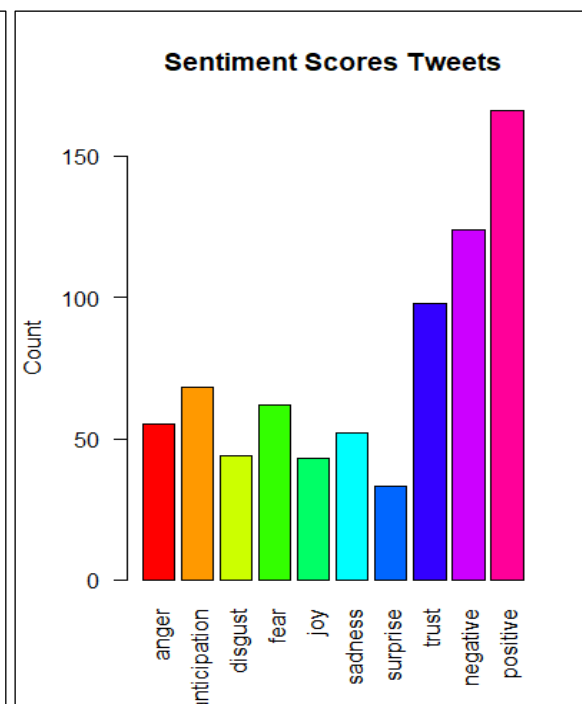
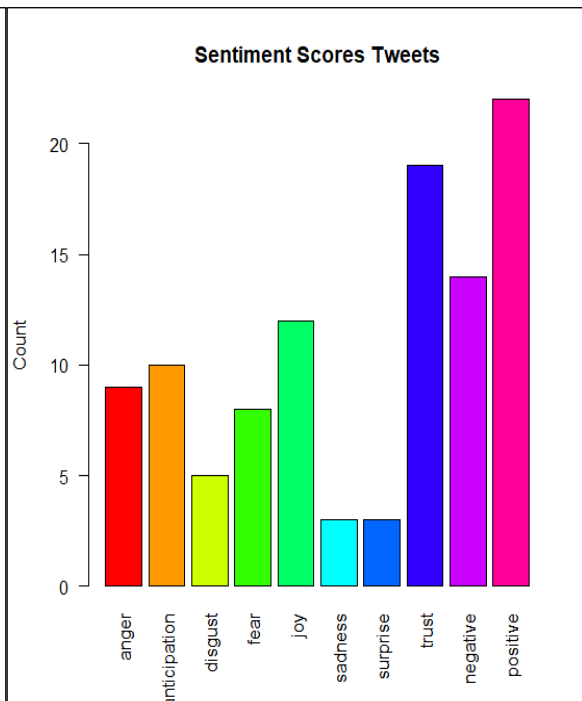


Figure 24: Sentiment Analysis Oatly after.





Brand/Tweets/ Handler/key words	Greenwashing Incident Timeline	Results – Before Total tweets (excluding retweets)	Results – After Total tweets (excluding retweets)
Innocent Smoothies Followers/Tweets 299.9k Followers 140.4k Tweets Twitter Handler @innocent	Advert-May 2021 ASA ruling- Feb 2022 https://www.asa.org.uk/rulings/innocent-ltd-g21-1111827-innocent-ltd.html Dates of data mining:- 01-11-2021 and 31-02-2022	mention @innocent = 301 tweets. Overall positive sentiment with the brand (Figure 2 displays the sentiment analysis plot)	mention @innocent = 490 tweets. Overall positive sentiment with the brand (Figure 17 displays the sentiment analysis plot)
Ryan Air Followers/Tweets 561.k Followers, 284.3k Tweets Twitter Handler @Ryanair	Advert- September 2019 ASA ruling- 5th Feb 2020 https://www.asa.org.uk/rulings/ryanair-ltd-cas-571089-p1w6b2.html Dates of data mining:- 01-11-2019 and 31-01-2020	mention @ Ryanair = 398 tweets. Overall positive sentiment with the brand (figure 3 - word cloud, Figure 4 - sentiment analysis plot)	mention @ Ryanair = 300 tweets. Overall positive sentiment with the brand (figure 3 - word cloud, Figure 19 - sentiment analysis plot)
Oatly Followers/Tweets 14.5K Followers, 17.8Tweets Twitter Handler @OatlyUK	Advert- 16th Jan 2021 ASA ruling- 26th Jan 2022 https://www.asa.org.uk/rulings/oatly-uk-ltd-g21-1096286-oatly-uk-ltd.html Dates of data mining:- 25-10-2021 and 24-01-2022	mention @OatlyUK = 574 tweets. Overall positive sentiment with the brand (Figure 8 sentiment analysis plot. Fig 7 Word cloud) @OatlyUK (not fv)	mention @OatlyUK = 564 tweets. Overall positive sentiment with the brand (Figure 21 sentiment analysis plot. Fig 20 Word cloud)
Alpro Followers/Tweets 61.7K Followers 44.8K Tweets Twitter Handler @Alpro	Advert- 18th October 2020 ASA ruling- 20th October 2021 https://www.asa.org.uk/rulings/alpro-uk-ltd-a20-1081249-alpro-uk-ltd.html Dates of data mining:- 18-07-2021 and 18-10-2021	mention@Alpro = 570 tweets. Overall positive sentiment with the brand (Figure 6 sentiment analysis plot. Fig 5 Word cloud)	mention@Alpro = 491 tweets. Overall positive sentiment with the brand (Figure 23 sentiment analysis plot. Fig 22 Word cloud)
Quorn Followers/Tweets 29.2K Followers Twitter Handler @QuornFoods	Advert- April 2020 ASA Ruling- 30th September 2020 https://www.asa.org.uk/rulings/marlow-foods-ltd-g20-1061634-marlow-foods-ltd.html Dates of data mining:- 30- 06-2020 and 30-09-2020	mention@QuornFoods = 494 tweets. Overall positive sentiment with the brand (Figure 10 - sentiment analysis plot. Fig. 9 word cloud)	mention@QuornFoods = 395 tweets. Overall positive sentiment with the brand (Figure 25 - sentiment analysis plot. Fig. 24 word cloud)

Lipton Ice Tea Followers/Tweets 59.2K Followers 37.4K Tweets Twitter Handler @Lipton	Advert- 13th August 2021 ASA Ruling- 19th January 2022 https://www.asa.org.uk/rulings/pepsi-lipton-international-a21-1120048-pepsi-lipton-international.html Dates of data mining:- 19-10-2021 and 19-01-2022	mention@Lipton = 493 tweets. Overall positive sentiment with the brand (Figure 10 - sentiment analysis plot. Fig. 11 Word cloud)	mention@Lipton = 398 tweets. Overall positive sentiment with the brand (Figure 27 - sentiment analysis plot. Fig. 26 Word cloud)
Hyundai Followers/Tweets 35.2K Followers 15.7k Tweets Twitter Handler @Hyundai_UK	Advert- 30th January 2021 ASA- 9th June 2021 https://www.asa.org.uk/rulings/hyundai-motor-uk-ltd-a21-1096716-hyundai-motor-uk-ltd.html Dates of data mining:- 09-03-2021 and 09-06-2021	mention @Hyundai_UK = 593 tweets. Overall positive sentiment with the brand (Figure 14 - sentiment analysis plot. Fig 13 word cloud)	mention @Hyundai_UK = 582 tweets. Overall positive sentiment with the brand (Figure 29 - sentiment analysis plot. Fig 28 word cloud)
Shell UK Followers/Tweets 20.6K Followers 1023 Tweets Twitter Handler @Shell_UKLtd	Advert- January 2020 ASA- 8th July 2020 https://www.asa.org.uk/rulings/shell-uk-ltd-g20-1049869-shell-uk-ltd.html Dates of data mining:- 08-04-2020 and 08-07-2020	mention@Shell_UKLtd = 397 tweets. Overall positive sentiment with the brand (Figure 16 - sentiment analysis plot. Fig 15 word cloud)	mention@Shell_UKLtd = 456 tweets. Overall positive sentiment with the brand (Figure 31 - sentiment analysis plot. Fig 30 word cloud)

Table 3: Brands Twitter and Accusation Dates, Before & After, Sentiment Analysis results and Word Clouds

5 Discussion and Conclusion

5.1 Findings and implications

The findings show adjustment in sentiment in the three- month period for all brands after they were found guilty of greenwashing by the ASA. General negative sentiments increased across the brands, which is unsurprising considering the severity of the issue. For example, a recent report showed that 28% of consumers have stopped engaging with certain brands due to the documented impacts they have on the environment and their unethical behaviour (Deloitte, 2021). The findings for some of the accused brands in this study, show that engagement from

consumers reduced, in relation to tweets posted. Therefore, a lack of engagement can be viewed as consumer disapproval of the brand in light of the greenwashing accusations.

Despite negative sentiment increasing, post accusations, and the level of tweets reducing for some brands, the levels of trust overall did not appear to be damaged and in most cases, trust increased. This finding may be explained by the quality of the online brand responses, posting timely apologies or demonstrating transparency regarding their errors.

Innocent

Sentiment remained positive for the brand both before and after, the ratio of negative Tweets increased. When considering each of the Plutchick wheel of emotions (Plutchick, 2002) this showed that the ratio of angry Tweets also increased after the 3 months period. This could suggest specifically for the Innocent brand that some form of brand transgression did occur with their Twitter followers. However, interestingly the emotion of trust increased for the brand over the 3-month period. Furthermore, the number of Tweets after the incident increased, suggesting engagement with the brand was not negatively affected (301 before and 490 after greenwashing). Innocent have previously been known to talk openly about their mistakes and their emphasis on '*not being a perfect brand*' (Grocery Gazette, 2022), which may therefore explain that although the brand has been found guilty of greenwashing, altering the sentiment in their consumers, they may still hold a relatively high level of trust and positivity with their followers for trying to show they are transparent about their mistakes.

Lipton

The ratio of positive Tweets remained constant before and after the greenwashing verdict. The negative sentiment increased as did certain negative emotions such as anger, fear, disgust and sadness. Joy was also shown to decrease afterwards. Also, the level of engagement from followers reduced slightly after the 3-month period from 493 to 398. However, interestingly the level of trust increased from 3 months before to 3 months after. Thus, again showing that although negative sentiment increases there is still a measure of trust with the Lipton brand. In response Lipton rescinded the claims stating that their adverts were not developed to '*intend to mislead*' but were only communicating that their bottles were now being made from 100% recycled PET materials (Tidman, 2022). Thus, suggesting that this was a genuine mistake which consumers may have taken into consideration after the greenwashing accusations.

Oatly

A similar pattern ensued the greenwashing claims for Oatly as the other brands. Positive sentiment remained high and consistent in the ratio of Tweets. However, again, negative sentiment increased after the three-month period which included increased emotions of anger, fear and disgust. Joy and sadness also reduced in the three months after. Engagement remained similar before and after suggesting that posting behaviour was not altered by the claims (574 before and 564 afterwards). Trust remained constant and was not altered by the greenwashing claims as was the case for all other brands in the study. In response to the case an Oatly spokesperson said "*It's clear that we could have been more specific in the way we described some of the scientific data...we're a science-based company and take pride in being precise, but we could have been clearer.*" (BBC, 2022). Thus, acknowledging in their response to the

verdict they may have unintentionally presented some misleading information to their consumers.

Alpro

The ratio of positive sentiment found in the Tweets remained high for Alpro. Negative sentiment also increased slightly including the emotions of anger and fear. Disgust remained similar before and after the upheld verdict. Trust also remained constant before and after and was not altered. This suggests again that trust is not impacted by greenwashing claims for this brand or others. However, engagement in relation to Tweeting behaviour reduced slightly from 570 before to 491 afterwards. Alpro responded to the claims by saying that they felt consumers would be able to consider the wider context of the communications and there is evidence that plant-based diets lower the carbon footprint in the agricultural focused food sector (Russell Speechleys, 2021).

Quorn Foods

Sentiment ratio of positive tweets remained constant before and after the greenwashing claims. However, the ratio of negative tweets also increased in the time period. With regards to the specific negative emotions: anger, disgust, fear and sadness all increased. However, trust remained consistent from the 3 months before and the 3 months after. For Quorn, again, this suggests that positive sentiment and trust are not impacted through greenwashing claims but that negative emotions can still increase. With regards to consumer engagement with Tweets the amount decreased after the greenwashing claims (494 before and 395 after). Quorn responded through removing the advertisement and released a statement saying *'it was never their intention to mislead consumers'* and that they had *'received a carbon footprint reduction certificate from the carbon trust'* (Southey, 2020). The response suggests it was a genuine mistake which may be one explanation why trust was not impacted.

Ryan Air

Similarly, for RyanAir the level of positive sentiment before and after they were found guilty of greenwashing remained constant. However, the findings also showed that the ratio of negative tweets increased in the 3-month period after. Anger, sadness and disgust were also found to increase showing that emotions associated with ill feelings towards the organisation had intensified. Interestingly again, trust increased slightly, showing that for Ryan Air although transgression had potentially occurred and there were increased negative emotions, it had not impacted trust. However, consumer engagement was found to decrease slightly after the greenwashing claims (398 before and 300 afterwards). In terms of Ryanair's response to the claims they put out a statement saying *'Our CO2 emissions per passenger-kilometer is 66 grams, which is 25 percent lower than the other major European airlines'* (Cokelaere, 2020) and are committed to be plastic free by 2023 (Sweeney, 2020). Therefore, although there was some increase in emotions associated with negative sentiment after they were held liable for greenwashing, there was also a high level of positive sentiment with increased trust which suggest that there is still consumer confidence with the brand.

Shell

Shell's results also showed high positive sentiment before and 3 months after the greenwashing claims. However, again the negative sentiment increased. Specifically, the emotions of anger, fear and disgust increased within the Tweets whilst joy decreased. Trust with the company remained consistent in the ratio of overall Tweets, again suggesting that trust is not impacted by greenwashing even if negative sentiment and negative emotions increase. Consumer engagement for Shell after the greenwashing claims actually increased (397 before and 456 after) suggesting this was not impacted by the claims. With regards to Shell's response to the ruling the decision included an appeal against the ASA decision and insisted to their audience that it is not a money-making scheme to increase fuel sales (Clarke, Howard & Barratt, 2021).

Hyundai

Hyundai reported consistently high positive sentiment both before and after. This included the increase in the emotion of joy. However, the overall ratio of negative Tweets also increased which included the emotions of anger and disgust. Again, the level of trust increased in the 3-month period afterwards reinforcing the argument that greenwashing may not impact or influence levels of trust towards the brand. Engagement remained constant before and after (593 before and 582 after) suggesting that engagement was not impacted by greenwashing. In response to the greenwashing claims Hyundai said that it was never talking about the expelling of exhaust gases but was about the purification of the air inside the vehicle (Marketing Week, 2021).

Considering the above, the results of this study substantiates to a certain degree the theoretical underpinning of brand transgression when brands have been found guilty of greenwashing. Thus, the findings may suggest that violation of the rules do have an impact on increasing negative consumer sentiment in relation to greenwashing for all brands in this study. Previous research has found that brand transgressions increase negative emotions such as anger which is then usually followed with consumer issues of trust and loyalty (Cheng-Xi Aw & Labrecque, 2022). However, it seems that for all the brands in this study that although negative sentiment increased, consumer trust with the brands was not altered and actually increased in the majority of cases. After a brand transgression, besides consumers engaging by negative valence through comments, consumers have been found to either avoid, reconcile and forgive brands (Aquino, Tripp, and Bies 2006; Tsarenko and Tojib, 2015) with the latter (forgiveness) being apparent in this study due to the unchanging or increasing levels of trust.

However, this research has shown greenwashing can have a level of impact on sentiment for all of the brands analysed in this study. To prevent such cases occurring, in the first instance brands should ensure they follow the ASA (ASA, 2022) and CMA (CMA, 2021) rules in relation to the communications and claims presented in their advertising. Prior to running advertising campaigns and communications, organisations in the same industry should look at comparable brands' greenwashing cases to ensure that they do not make the same mistakes and follow the specific guidance. There have also been suggestions that clearer guidance frameworks are required for organisations as it is apparent through the responses of the organisations they are not always fully aware that they are breaking any rules. For example, Innocent is requesting that the government back the 'better business act' that will assist businesses in responsible operations and prevent such cases happening. It has also been suggested that brands should seek expertise from scientific communities or engage with a

sustainability consultancy prior to releasing sustainability focused communications (Costa, 2022).

5.2 Limitations and direction for future research

This study only focused on analysing Twitter posts in relation to greenwashing. However, if accessibility permits in the future other social media platforms such as Facebook, Instagram this could be analysed comparatively. As we considered changing levels of trust in our study, it would be interesting to explore whether trust levels differ between platforms. For example, Duh and colleagues suggested that stronger levels of trust could be discovered on interactions on Facebook rather than other platforms, as interactions are largely from friends or acquaintances. Despite trust levels being higher on Facebook, the authors did not analyse e-WOM impact on purchase decisions (Duh, 2021). Furthermore, it is unknown whether Twitter posts present a true reflection of how consumers feel about brands and further explorations of consumer perspectives are required for each of the mentioned brands.

With the continuous development of sustainability and active campaigners across various media, future research should consider the changes in consumer sentiment towards different brands after the 6 step CMA green code has been fully implemented (see CMA, 2021). Research should be undertaken on whether consumers feel more positive towards brands once they know that the rules are far more stringent. It is also unclear from this study as to the long-term damage greenwashing can have on the named brands and the findings in this study may have only been an initial reaction to the upheld accusations. Therefore, another study should consider the longer-term effects of greenwashing on customer sentiment beyond a 3-months snapshot in time. Other brands could also be researched in different industries to find out if greenwashing has the same impact. For example, previous research suggested that brand transgressions may not be as significant with brands who are classed as ‘exciting’ (Aaker, 2004) and further explorations could be conducted in this field in relation to the named brands in this study and also to extend to other brands. Financial implications of greenwashing could be considered alongside the findings of this study for the brands analysed. Trust was found to be unchanged in this study and it is important to understand from more in-depth customer perspectives why this is the case.

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