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Corporate Responses to the Coronavirus Crisis and their Impact on Electronic-Word-of-Mouth and Trust Recovery: Evidence from Social Media

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Abstract

This study examines how corporate responses to service failure, caused by the Coronavirus (COVID-19) crisis, influence electronic word-of-mouth (E-WoM) and trust recovery around lockdown, using multiple data sources. A dataset of 398 valid COVID-19 announcements from 50 UK food retailers posted on the social media platform Twitter, and 21,960 consumer comments associated with these announcements are analysed using content analysis and social media analytics respectively. In Study 1, we test the effects of corporate crisis response strategy (defensive versus offensive) and response framing (emotional versus rational) on consumer E-WoM (measured as 'consumer sentiment'). The results reveal that using a defensive corporate response strategy with emotionally framed announcements leads to more positive consumer E-WoM. In Study 2, we advance the findings of Study 1 using a vignette-based experimental design to examine how social media announcements made by food retailing brands influence consumers' trust recovery. We find that consumer trust recovers significantly when corporate COVID-19 responses are framed in an emotional manner. By drawing upon signalling theory, this study makes an important contribution to public health crisis communication and service failure literature by demystifying consumers' reactions towards corporate crisis responses amid a pandemic.

Keywords: Coronavirus (COVID-19) crisis, Electronic Word-of-Mouth (E-WoM), trust recovery, vignette-based experimental method, data analytics, social media

1. Introduction

The Coronavirus disease, officially termed COVID-19 by the World Health Organisation (WHO), has been viewed as a public health emergency[1]. The emerging COVID-19 crisis has had a dramatic effect on many business sectors and may trigger a recession (Godman, 2020). At the current time, the ultimate impact of the pandemic remains ambiguous, as vaccines are starting to be approved and slowly administered. However, many governments have had to introduce, and subsequently re-introduce measures such as lockdowns, social distancing, and strict hygiene requirements to respond to the pandemic crisis. This crisis has undoubtedly resulted in service failure[2] as many retailers have closed, run out of stock or had to ration purchases, with consumers having to queue to enter supermarkets during the initial lockdown. Consumers have changed their purchasing patterns and behaviours, and this has led to more online shopping, stockpiling and bulk-buying (He and Harris, 2020).

We build upon the public health crisis communication and service failure literature as well as signalling theory to explore the influence which corporate crisis communication responses have on consumers' behavioural reactions in social media environments. By developing and testing a theoretical framework which demonstrates the interaction effects that corporate crisis response strategy (offensive versus defensive strategy) and response framing (emotional versus rational) have on consumer electronic word of mouth (E-WoM) and trust recovery, this paper contributes to the development of signalling theory in the context of corporate responses to a public health crisis. In doing so, we answer recent calls for further research which focuses on

[1] According to the WHO's dictionary, a public health emergency is defined as: 'An occurrence or imminent threat of an illness or health condition, caused by bio terrorism, epidemic or pandemic disease, or (a) novel and highly fatal infectious agent or biological toxin, that poses a substantial risk of a significant number of human fatalities or incidents or permanent or long-term disability.' The definition of public health emergency can be found at: https://www.who.int/hac/about/definitions/en/

[2] "Service failure usually occurs when an organisation fails to meet consumer desires; service *failure* recovery describes the activities a service provider or company takes in response to that failure" (Fouroudi et al. 2020 p. 2575)

service failure and recovery in new contexts (i.e. public health crisis), that takes a multi-source perspective, and uses big data from social media (Grégoire and Mattila, 2020; Khamitov et al., 2020). This study is set to answer the following three research questions:

RQ1: How do corporate social media announcements relating to a public health crisis influence consumer E-WoM and trust recovery?

RQ2: During a public health crisis, what response strategy (offensive versus defensive) and response framing (emotional versus rational) on social media is most effective in driving consumer positive E-WoM and trust recovery?

RQ3: How do the effects of crisis response strategy and crisis response framing interact in driving consumer positive E-WoM and trust recovery?

To answer our research questions, two studies are conducted. Study 1 examines UK food retailers' announcements relating to COVID-19 posted on Twitter over a two-month period spanning 1st March 2020 (three weeks before lockdown measures were announced in the UK) through to 30th April 2020 (the day when it was announced that lockdown measures would be reduced from May 10th) (BBC, 2020). A data set comprising 50 UK food retailers, with 398 valid, corporate COVID-19 crisis communication announcements posted on Twitter, as well as 21,960 consumer comments (replies) related to these announcements is developed and analysed. Study 2 examines changes in consumer trust towards different corporate crisis response strategies and framing approaches during the pandemic. A three-stage experiment is designed to consider one UK food retailer and two different pandemic crisis vignettes which create eight mock-Twitter tweets.

2. Pertinent Literature and Conceptual Model Development

According to crisis management literature, developing appropriate corporate response strategies is the key to addressing a public health crisis (Malet and Korbitz, 2015; Page et al., 2006; Volo, 2008). During a crisis, *response* is defined as the ability to react to emerging risks through reconfiguring resources and to implement appropriate crisis communication strategies

(Ritchie, 2008). In Appendix A, we summarise the representative empirical studies focusing on public health crisis responses. Although crisis management studies provide examples of well-documented experiences and best practice to combat a crisis, we identify several research gaps which should be addressed.

First, extant research has frequently discussed the important role of governmental communication in addressing the challenges created by a public health crisis. An appropriate governmental risk communication strategy will enable the business sector to recover more quickly from a public health crisis (e.g. Malet and Korbitz, 2015; Page et al., 2006; Volo, 2008). While social media has been widely regarded as an important communication platform, existing literature has not specifically focused on explaining how firms should use social media to communicate with their customers during a public health crisis.

Second, the severity and duration of the COVID-19 pandemic is unprecedented compared to all other types of recent crisis. Its reach is global, and the disease is highly contagious compared to other epidemic, or pandemic, disease outbreaks such as SARS, H1N1, MERS, Ebola and Zika. Therefore, it is necessary to revisit and update the existing models, strategies and theories of public health crisis communication to cope with the uniqueness, complexity and unpredictability of this global pandemic (Knowles et al., 2020).

Third, the government sector has been a particular focus of a wide range of relevant studies (e.g. Chong, 2006 and Novelli et al., 2018), which attributed to the fact that government authorities play a primary role in public health crisis communication. However, the retail and consumption related industries have received much less attention. The UK food retailers, such as supermarkets, have been a business sector hugely impacted by the COVID-19 outbreak (TextAnywhere, 2020). For example, the UK's vegetable box providers were expected to deliver 3.5 million boxes to their customers within two months during the summer of 2020, which is double the demands of the pre-COVID-19 period (Food Foundation; 2020). In

addition, consumer stockpiling and panic buying behaviour triggered a shortage of essentials and a growing distrust of UK food retailers' ability to cope with unprecedented demand (Connors et al., 2020). Due to the demand uncertainty and consumers' concerns about their safety while shopping, corporations have suffered from service failures and a loss of customer trust (Lee et al., 2020). Therefore, the establishment of effective crisis communication and service recovery strategies is an urgent priority for UK food retailers, seeking to prioritise customer needs and recover customer trust (Broadbent, 2020; Bunker, 2020).

Fourth, E-WoM is increasingly being used by consumers to express their displeasure with service failure (Fourodi et al., 2020). E-WoM involves positive, negative or neutral statements which consumers make about a product, or a corporation, which are available for others to view on the internet (Filieri and McLeay, 2014). We envision that managers attempt to learn from consumer generated E-WoM as they attempt to evaluate their corporate responses to the pandemic. In particular, E-WoM may provide evidence of a recovery from a loss of consumer trust due to service failure. Prior research has often overlooked or ignored the rich social media data generated by consumers in service failure contexts. We address this gap by using social media data to better understand the consumer experience during service failures caused by COVID-19.

To fill the gaps in prior research, we draw upon signalling theory to provide a theoretical lens for our conceptual model and analysis. Signalling theory is concerned with building communication relationships and reducing information asymmetries between two parties (a sender and receiver) (Connelly et al., 2011; Walsh et al., 2009). Signals are considered as the presentation of corporate announcements and can convey important information regarding the sender's intention and abilities (Musteen et al., 2010). For instance, when corporations experience atypical changes in their service provision (service failure), they often communicate, or signal, the changes to consumers who may interpret such information in different manners.

Signalling theory has been frequently used in service failure literature to study approaches to relationship recovery (Kharouf et al., 2020), to explain the effectiveness of corporate announcements (Ni et al., 2016) and to examine product recall communications (Hsu and Lawrence, 2016). As such, the application of signalling theory has proven useful in advancing our understanding of where corporate signals originate, what specific signals flow from those sources, and the resultant impact that these signals may have on the behavioural reactions of customers (Drover et al., 2018).

We apply signalling theory in an attempt to better understand how consumers react to corporate social media announcements relating to service failure caused by the global pandemic crisis. The literature suggests that during a crisis, consumers are likely to pay close attention to corporations' response strategies on social media, especially actions that reduce the negative impact of the crisis on consumers (Tse et al., 2016). Coombs (2007) defines crisis response strategy as an organisation's answer to an unexpected event in the hope of repairing reputation, reducing negative impacts and preventing negative behavioural intentions. Crisis response framing, defined by Claeys and Cauberghe (2014), refers to the use of language to convey messages which appeal to individual feelings and have an effect on consumer behaviour. The strategy and communication frame which signallers adopt aims to intentionally communicate information, thereby conveying the positive attributes of a corporation as they attempt to obtain a good consumer reputation (Connelly et al., 2011; Walsh et al., 2016). Therefore, our research model aims to investigate the varied effects of crisis response (i.e. response framing and response strategy signals) on consumer reactions to corporate service failure. The research model contains two studies and is illustrated in Figure 1.

In Study 1, we examine the effects of corporate response strategies and framing on customers' E-WoM by analysing a large volume of consumer responses which enhances the external validity and supports the generalisability of the study. In Study 2, we investigate how,

and if, corporate responses enable consumers to recover trust using a scenario-based experiment, establishing internal validity based on precisely controlling and measuring changes in consumer trust. In a crisis situation, understanding E-WoM and enhancing trust recovery are two critical areas of concern for managers. However, they are also two distinctive concepts which are difficult to measure through a single data source or examine using a single method. Although the management and marketing literature has widely accepted the use of social media data to measure E-WoM, customer trust is a highly abstract concept which is difficult to measure using social media data alone (Pavlou and Dimoka, 2006). Therefore, Study 2 supplements the results of Study 1.

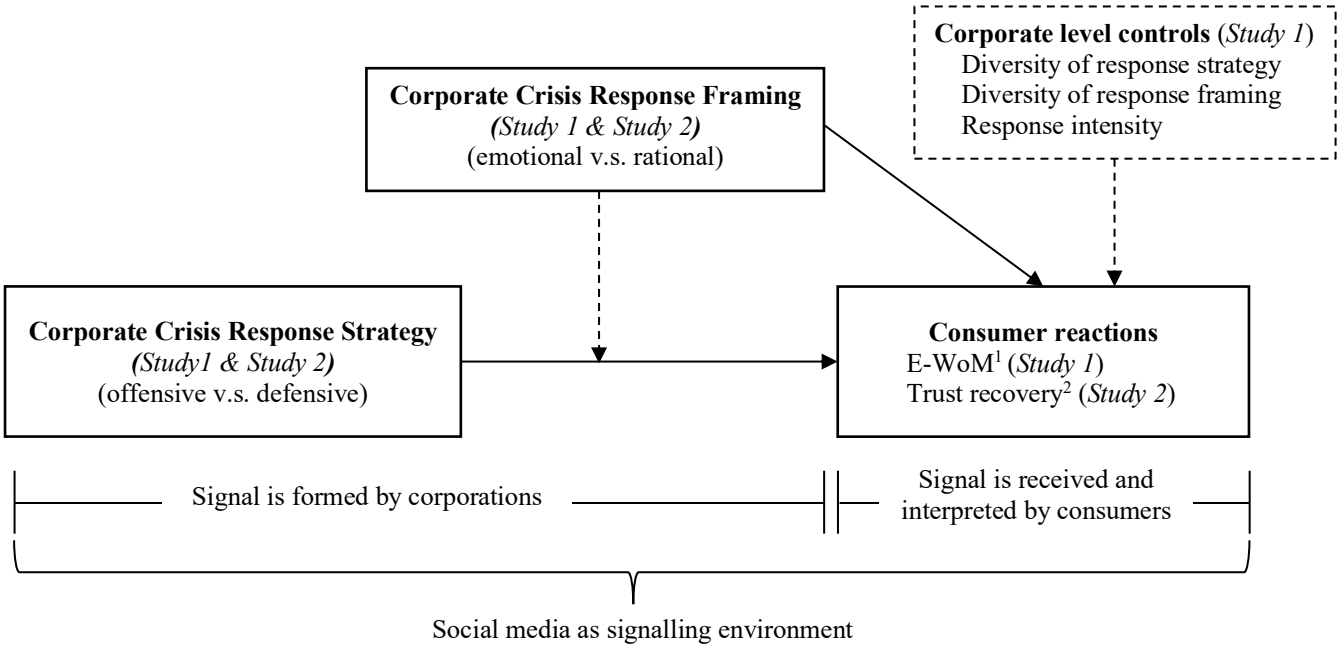

Figure 1. Research model of Study 1 and Study 2

[1] Electronic word of mouth represents the average sentiment values of the Twitter users' comments towards corporate announcements

[2] Trust recovery represents the changes in trustworthiness level at different stages of the pandemic: Stage 1: baseline (before the COVID-19 crisis); Stage 2: during the COVID-19 crisis; and Stage 3: after seeing corporate tweets regarding responses to COVID-19.

3. Hypothesis Development

3.1. The Varied Effects of Crisis Response on E-WoM

Corporations have developed crisis response strategies to communicate with consumers during various crises, in an attempt to maintain sales, rebuild brand reputation, and improve customer relationships (Sela et al., 2012; He et al., 2018). Two opposing types of response strategies explicitly feature in the marketing literature: offensive responses and defensive responses (Fornell and Wernerfelt, 1987; Hauser and Shugan, 2008). An offensive corporate response strategy primarily focuses on corporations attracting new consumers, or competitors' dissatisfied consumers, increasing purchases, and obtaining a greater market share (He et al., 2018; Fornell and Wernerfelt, 1987). In contrast, a defensive strategy protects a corporation's market share from attack by external factors such as competition and crisis (Woodall, 2004), with marketing efforts directed at existing customers and customer retention activities (Martin-Herran and Sigue, 2019; Roberts, 2005). Real examples of offensive and defensive COVID-19 corporate crisis response announcements are presented in Appendix B.

During a crisis, a defensive announcement (signal) explaining a corporation's situation, is likely to lead to consumers gaining a better understanding of the business and reducing the proportion of dissatisfied customers who would otherwise complain (He et al., 2018). Consumers may view a defensive announcement as proof of a corporation's determination and efforts to cope with the crisis. Drawing on signalling theory, for example, Kharouf et al. (2020) suggest that announcements focusing on retaining existing customers could repair corporate-consumer relationships and result in positive corporate reputations during a crisis. In times of COVID-19, lockdown-induced panic buying led to food retailers imposing purchasing restrictions and limiting operational hours. In response, some food retailers develop defensive communications that provide corrective and restorative guidance (e.g. frontline hygiene and social distancing restrictions) in order to explain the crisis situation to consumers. Signalling theory indicates that a receiver's perceptions of a signal are largely dependent on the extent to which signallers are honest about a situation (Connelly et al. 2011). Hence, a proper defensive

response strategy enables consumers to gain a better understanding of corporate COVID-19 contingency plans. These actions are important to reduce the proportion of dissatisfied consumers who would otherwise complain and to ensure that consumers can disseminate positive E-WoM to support food retailers, if appropriate.

On the other hand, an offensive response strategy has been acknowledged to improve customers' E-WoM and satisfaction in certain circumstances (Karakaya and Yannopoulos, 2010; Gao et al., 2017). However, in the context of COVID-19, offensive signals which mainly emphasise the promotion of products and brands without responding to consumers' concerns about the pandemic in an empathetic manner, are likely to cause dissatisfaction and the spread of negative E-WoM (Sheth, 2020). Therefore, we argue that the clarification of a corporation's situation using a defensive strategy is more likely to enhance existing customers' understanding, acceptance, and positive E-WoM than an offensive strategy which seeks to increase purchases or recruit new consumers. We propose the following hypothesis:

Hypothesis 1 (H1): *A defensive crisis response strategy will result in more positive consumer E-WoM than an offensive crisis response strategy.*

In addition to corporate response strategies, the ways in which announcements are framed and presented are also likely to have an impact on how consumers evaluate communication announcements and spread E-WoM during a crisis (Claeys and Cauberghe, 2014). Consumers who receive signals make decisions based on their perceptions of the information presented in the signal, which can be influenced by how a message is framed (Connelly et al., 2011). Prior studies have examined the effects of language framing by exploring the influence which emotional and rational corporate responses have on consumer behaviour (Sela et al., 2012). Emotional responses appeal to the use of subjective and evaluative properties in

communication messages to persuade consumers, while rational responses, focus on informative and straightforward messages (Orth et al., 2007; Claeys and Cauberghe, 2014).

Research on consumer-brand relationships has proved that high levels of (positive) emotional responses are associated with more favourable consumer perceptions of a brand and/or corporation (Schoefer and Diamantopoulos, 2009; Frank et al., 2014). Applied in the COVID-19 situation, where consumers generally and continuously seek support, emotional announcements indicating care and connection are critical for creating positive experiences. Moreover, the usage of emotional terms such as 'we' and 'us' in framing a message can indicate a close relationship and common identity shared between the signaller and the receiver (Sela et al., 2012). E-WoM is, to a large extent, driven by the emotions that consumers perceive and feel when interacting with a corporation (Verhagen et al., 2013). Following these theoretical arguments, an emotionally framed, corporate crisis response will reinforce consumers' perceptions that they have a positive and supportive relationship with a corporation, leading to positive consumer E-WoM.

Additionally, from a psychological perspective, rational framing is more likely to induce cognitive reactions when consumers view a corporate announcement (Claeys and Cauberghe, 2014). In a pandemic crisis, when consumers are separated and experience social isolation, consumers who receive signals which are framed in an emotional and supportive manner, are likely to experience enhanced relationships with a corporation (Odekerken-Schroder et al., 2020). Hence, we propose the following hypothesis:

Hypothesis 2 (H2): *Emotional framed responses will result in more positive consumer E-WoM than rational framed responses.*

Emotional framing can also serve as a means of reinforcing customers' perceptions of the impact of corporate crisis response strategies. Prior studies in customer communications indicate that when corporations provide information, consumers are sensitive to minor changes in wording and subtle linguistic components (i.e. the incorporation of emotional or rational components) in communication signals, which, in turn, has an impact on customers' opinions of a corporation (Sela et al., 2012). The effect of communication strategy on consumers' behavioural actions may vary depending on how communication content is framed (Claeys and Cauberghe, 2014; Claeys et al., 2013; Cummings and Yule, 2020).

The role of emotional framing cannot be neglected when developing crisis response strategies (Coombs and Holladay, 2005). The moderation role of response framing is based on the premise that corporations will firstly decide on which response strategy to adopt in a crisis communication announcement, and subsequently, develop the language framing. Signalling theory emphasises the importance of consistency between a signal's content and its framing (Connelly et al., 2011). In the crisis management context, the use of emotional framing can be an effective addition to a defensive crisis response strategy, as consumers tend to build a better understanding of the corporation's situation (Coombs, 2007). Hence, we propose the following hypothesis:

Hypothesis 3a (H3a): *A defensive crisis response strategy framed in an emotional manner will result in more positive consumer E-WoM than one framed in a rational manner.*

We expect that the effects of language framing will be different when a corporation engages an offensive crisis response strategy which seeks to compete within the marketplace and attract new customers through price promotion or product and brand marketing (He et al., 2018). A consensus in the signalling literature is that visible, credible and structured signals

are helpful in indicating a signaller's unobservable qualities and capabilities (Xia et al., 2016). Following this line of thought, corporations can develop offensive crisis communication announcements in a rational and structured manner which demonstrate their capability to provide better products/services than their competitors and therefore, gain a positive consumer reputation. For instance, logical messages that highlight in-store safety enhancements, or the development of competitive online delivery services, may make consumers feel safe enough to shop with them and subsequently, promote their brand using E-WoM. Hence, we expect that framing corporate crisis responses in a rational manner will strengthen the impact of an offensive response strategy and generate positive E-WoM, which leads to the following hypothesis:

Hypothesis 3b (H3b): *An offensive crisis response strategy framed in a rational manner will result in more positive consumer E-WoM than one framed in an emotional manner.*

3.2. The Varied Effects of Crisis Response on Trust Recovery

During a crisis, attempts to regain consumers' beliefs, intentions, and trust should be at the top of the strategic agenda of any corporation which has experienced service failure (Fouroudi et al., 2020; Kim et al., 2014). As trust is often lost as a result of a service failure, it is important for managers to rectify, amend, and restore losses in trust experienced by customers (Hess et al., 2003; Kharouf et al., 2020). Trust in a brand is mainly shaped by consumers' confidence in a corporation's reliability and integrity (Morgand and Hunt, 1994). Corporate crisis response announcements, which explain the reasons for a service failure and signal their reliability and competence at addressing negative customer experiences, tend to rebuild trust with existing customers. Rather than using an offensive strategy which draws customer attention away from the crisis, a defensive response strategy can help to build

reputation and trust with existing customers as well as the wider marketplace (Luo and Humburg, 2007).

Furthermore, defensive responses can signal a corporation's ethical, moral and fair-thinking characteristics which consequently increase trustworthiness (Basoglu and Hess, 2014). Similar arguments in the situational crisis and the service failure communication literature suggest that no matter how a corporation responds to negative events associated with a crisis, direct communications to customers are essential for recovering consumer trust and enabling 'forgiveness' (Coombs, 2007; Kharouf, et al. 2020; Xiao et al., 2020). Therefore, we propose the following hypothesis:

Hypothesis 4 (H4): *A defensive crisis response strategy will result in greater consumer trust recovery than an offensive response strategy.*

The extent to which corporations are sincere in their crisis communication announcements signals their level of consideration in consumer interest and well-being, when developing trust recovery initiatives (Xie and Peng, 2009; Xiao et al., 2018). In comparison with rational framing, an emotionally framed announcement which focuses on subjective and emotional factors, is normally perceived by customers as more sincere (Claeys et al., 2013). Existing research has provided evidence that messages expressing emotions when communicating a crisis response can lead to higher levels of consumer trust restoration (van der Meer and Verhoeven, 2014). For example, research in the social media communication field reveals that a crisis response message which expresses hope (i.e. emotional framing) is more effective in developing post-crisis information acceptance than a rational framed message (Xiao et al., 2020). Huang and DiStaso (2020) provide similar results in the context of highly contagious

disease outbreak: an emotional appeal leads to responses being perceived as more credible, therefore, increasing public trust towards a corporation.

One reason why a message framed in an emotional manner results in greater trust recovery, is because it allows a corporation to express its 'human' side (McCorkindale and DiStaso, 2014). The COVID-19 pandemic has been a nightmare for food retailers seeking to manage customer complaints about, for example, product shortages. The COVID-19 crisis is likely to have evoked negative emotions such as outrage, or dissatisfaction, among some customers and damaged trust (Malecki et al., 2020). The utilisation of an emotionally framed approach will enable a corporation to express remorse for negative consequences, assert its strong willingness to take responsibility and to demonstrate hope for the future (Malecki et al., 2020; Xie and Peng, 2009). Consumers may perceive that a corporation which responds with an emotionally framed message is seeking to solve problems and recover trustworthiness. In summary, an emotionally framed response implies a corporation's 'good faith' in taking responsibility for negative events. Therefore, the following hypothesis is posited:

Hypothesis 5 (H5): *Emotionally framed responses will result in greater consumer trust recovery than rationally framed responses.*

To develop effective corporate crisis communication signals, it is important to consider how the effects of the interaction between corporate response strategy and framing influence consumer trust recovery (e.g. providing the 'right' response framing with the 'right' response strategy). Prior research argues that the framing of corporate crisis communication responses can reinforce the link between a corporate response strategy and consumer reactions during, and after, a crisis (Claeys and Cauberghe, 2014; Claeys et al., 2010). For example, the results of research conducted by Claeys and Cauberghe (2014) suggest that when corporate

communication messages are framed in a rational manner, consumers develop positive attitudes.

COVID-19 is categorised as a 'victim cluster' crisis (Coombs, 2007) in which corporations are perceived as the victim rather than the cause of a crisis. Thus, we argue that defensive corporate communication strategies which are framed in an emotional manner by corporations may evoke empathy and mitigate market uncertainty and decrease consumer anxiety (Bunker, 2020; Novelli et al., 2018) and thus generate more positive E-WoM. For example, during the COVID-19 crisis to rebuild consumer trust, Tesco introduced the 'Keeping you Safe' campaign. This campaign not only aims to provide clear guidance on social distancing, but also conveys messages associated with positive emotions (e.g. "Together, we can do this" and "#EveryLittleHelps") to reduce consumers' anxiety and depression.

While the success of a defensive corporate crisis response strategy is likely to depend on engaging customers by appealing to their emotions, we propose that an effective offensive response strategy will be highly reliant on leveraging rational frames to recover consumer trust. Indeed, the success of an offensive response strategy is determined by whether consumers are persuaded by the offers, or value proposition, made by a corporation. The results of research undertaken by Claeys and Cauberghe (2014) suggest that framing corporate crisis response messages in a rational manner, in an effort to respond to service failure, can persuade customers to engage with a brand and develop more positive attitudes. For instance, in the UK, Aldi developed offensive response strategies which featured popular product lines[3] and emphasised the high levels of availability of the products they sell (without introducing product limits) relative to other food retailers (Kollewe and Butler, 2020). These offensive responses, which

[3] This argument is supported by the author's own observations of Aldi's tweets during COVID-19 outbreak in the UK.

were framed in an informative and persuasive manner, have the potential to amplify consumer trust. We therefore develop the following two hypotheses:

Hypothesis 6a (H6a): *A defensive crisis response strategy framed in an emotional manner will result in a higher likelihood of consumer trust recovery than one framed in a rational manner.*

Hypothesis 6b (H6b): *An offensive crisis response strategy framed in a rational manner will result in a higher likelihood of consumer trust recovery than one framed in a rational manner.*

4. Study 1

4.1. Empirical Setting and Data Collection

In study 1, we examine: (1) The effects that corporate crisis response strategies have on E-WoM; (2) The effects that corporate crisis response framing has on E-WoM; (3) The moderating effect that corporate response framing has on the relationship between response strategy and E-WoM. Accordingly, our primary outcome variable of interest is consumer E-WoM in response to corporate announcements related to COVID-19 on social media. Our independent variables include categorical variables reflecting response strategies (offensive and defensive) and response framing (rational and emotional), respectively.

We provide an overview of the empirical setting in Figure 2. In Stage 1, we identified a sample of UK food retailers. To be included in our dataset, the food retailers needed to have more than 250 employees, an active Twitter page, and to have made at least one announcement related to COVID-19 on Twitter[4] during the pandemic crisis. Using these criteria, a sample of 398 responses to COVID-19 from 50 UK food retailers was identified. Stage 2 involved building the dataset. The independent variables (i.e. response strategy and response framing) were empirically measured using a three-step, coding process, while the dependent variables

[4] Twitter, a microblogging social media platform, allows researchers not only to observe corporations' news and status updates relating to COVID-19, but also to capture consumers' reactions towards corporations (Rao et al., 2020).

were assessed using social media metrics extracted from Twitter. We then matched corporate announcement data to online consumer comments data to model the relationship between the crisis communication signals and consumer reactions. In the final stage, we conducted a series of analyses to gain insights for crisis communication and service failure recovery and offer practical guidance and outline the implications of crisis communication strategies for food retailers.

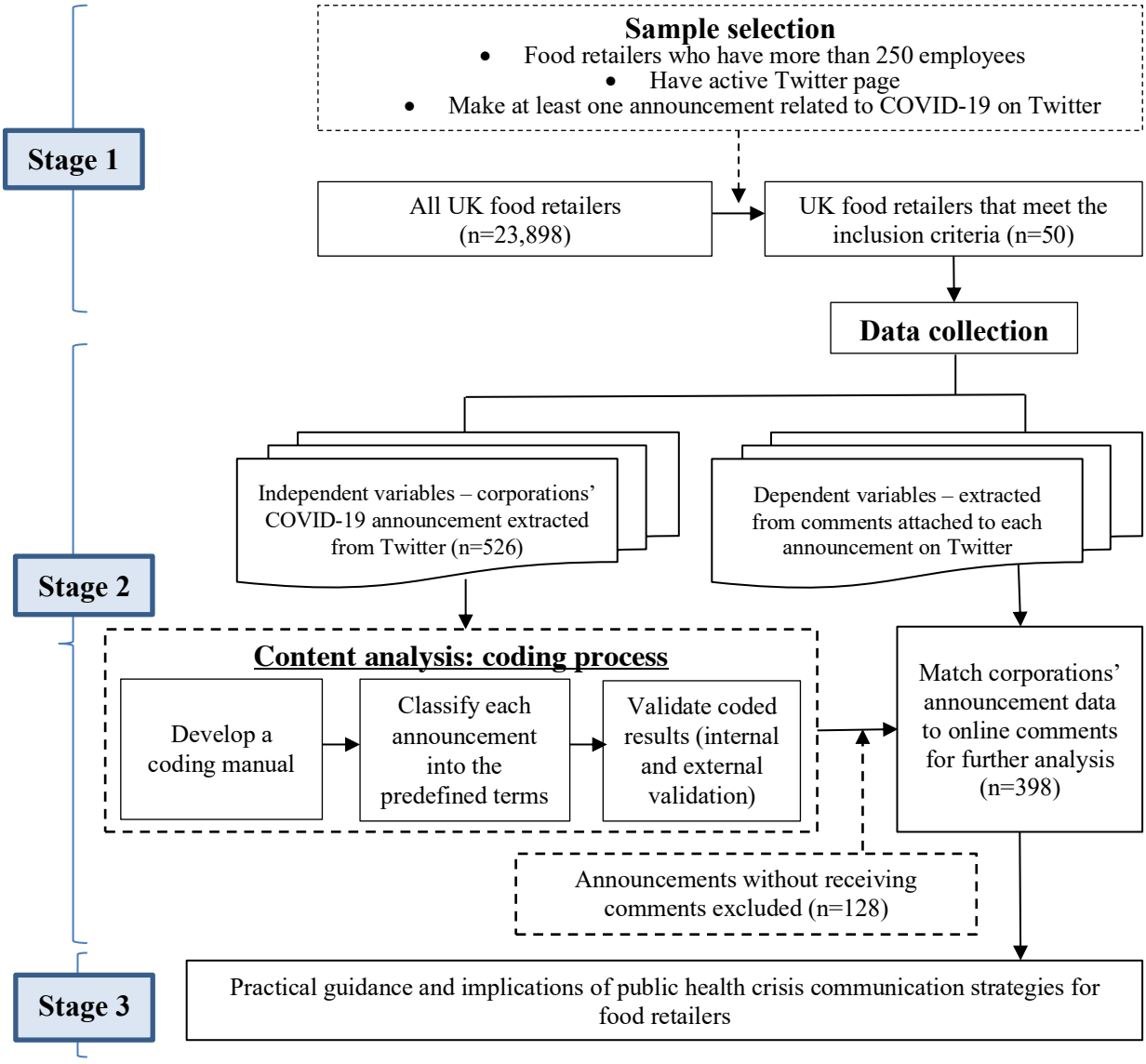

Figure 2. Flow chart of empirical setting

4.2. Measures

Independent variables. The COVID-19 announcements were categorised into emotional framing versus rational framing (Claeys and Cauberghe, 2014) and offensive strategy versus defensive strategy (He et al., 2018) through rigorous content analysis. Content analysis has been widely adopted in the marketing literature and is an appropriate approach for analysing documents, or statements, that have a clear structure and flow (Kim and Kumar, 2018), as well as a useful approach for analysing social media posts (Lee et al., 2018a; Meire et al., 2019) and other forms of corporate marketing communication signals (Kim and Kumar, 2018). For example, Kim and Kumar (2018) investigate two specific types of corporate communication signals (i.e. economic and relational) using content analysis to analyse direct corporate marketing communications and examine their impacts on purchase behaviour in a B2B context. Similarly, Meire et al. (2019) categorise marketer-generated content, extracted from Facebook fan pages, into informational and emotional posts and investigate the types of posts which have had the most influence on consumer sentiments. As marketer-generated content reflects managers' mind-sets and cognitions, it is difficult to utilise a computer-aided text analysis to automatically capture the sharing of meaning, complicated information and concepts (Saboo and Grewal, 2013). Moreover, given the relatively low number of corporate COVID-19 announcements (i.e. 398 announcements) and the absence of ready-to-use dictionaries, we chose manual coding rather than an analytical approach. Indeed, an analytical approach would require training the data to build algorithms and develop a predictive model (Lee et al., 2018a), which is not an effective approach for our study. We provide details of the coding process in Appendix B.

Electronic Word of Mouth. E-WoM is considered to be an important consumer information source as it consists of consumer opinions, experiences, and emotional reactions (Hsu and Lawrence, 2016). In a public health crisis, E-WoM, generated by individual consumers on social media, has proven to have tremendous impact on corporations,

governments and societies, as it is perceived as more trustworthy than traditional media (Park et al., 2019). Thus, using a web crawler, we extracted consumers' 'Reply' tweets which commented on food retailers' COVID-19 crisis response tweets on Twitter, to capture consumer E-WoM.

Control Variables. We collected data on three control variables: 1) Diversity of response strategy; 2) Diversity of response framing; 3) Intensity of response.

We detail the measurement of E-WoM and control variables in Appendix C.

4.3. Results and Discussions

A two-way ANCOVA was employed to analyse the data and test the hypotheses. With regards to control variables, we found that including diversity of response strategy, diversity of response framing, and intensity of response measures as covariates in the analyses did not influence the results. The results support the predicted main effect of both corporate crisis response strategy and response framing, as well as the interaction between these factors. As predicted by H1, consumers exposed to tweets by food retailers using a defensive COVID-19 response strategy had higher levels of positive E-WoM, in comparison to consumers exposed to an offensive response strategy ($M_{defensive}$ =0.1147, $M_{offensive}$ = 0.0106, p<0.05). Response framing also had a significant effect on E-WoM (supporting H2) as COVID-19 announcements framed in an emotional manner provided more positive E-WoM in comparison with those formulated in a rational manner ($M_{emotional}$ = 0.1917, $M_{rational}$ =0.0032, p<0.05).

With respect to the hypothesised interactions, we found evidence of a positive interaction between corporate crisis response strategy and response framing (see Table 1 and Figure 3). Specifically, as posited by H3a, when corporate COVID-19 response announcements posted on social media were developed using a defensive response strategy, the incorporation of a message framed in an emotional manner significantly increased positive E-WoM ($M_{emotional}$

=0.358, $M_{rational}$ =-0.011). However, when food retailers used an offensive response strategy, there was no difference between emotional and rational framing in terms of the effect on E-WoM ($M_{emotional}$ =0.060, $M_{rational}$ =-0.015). Hence, H3b is not supported.

Table 1. Results of Study 1

Dependent variable: E-WoM					
Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	9.676[a]	6	1.613	4.525	0.000
Intercept	0.456	1	0.465	1.309	0.253
Diversity of response framing	1.816	1	1.816	5.118	0.024
Diversity of response strategy	0.155	1	0.155	0.436	0.510
Intensity of response	2.937	1	2.937	8.276	0.004
Response strategy	1.656	1	1.656	4.666	0.031
Response framing	3.369	1	3.369	9.493	0.002
Strategy*Framing	1.619	1	1.619	4.562	0.033
Error	138.738	391	0.355		
Total	149.588	398			
Corrected Total	148.413	397			
Manipulation			Mean[b] (Std. Error)		
Response strategy	Response Framing	N	E-WoM		
Offensive	Emotional	44	0.060(0.091)		
	Rational	187	-0.015(0.045)		
Defensive	Emotional	64	0.358(0.077)		
	Rational	103	-0.011(0.059)		

a. R squared = 0.065 (adjusted R squared = 0.051)

b. Controls appearing in the model are evaluated at the following values: Diversity of response framing=0.2579, diversity of response strategy= 0.3919, Intensity of response = 0.2034

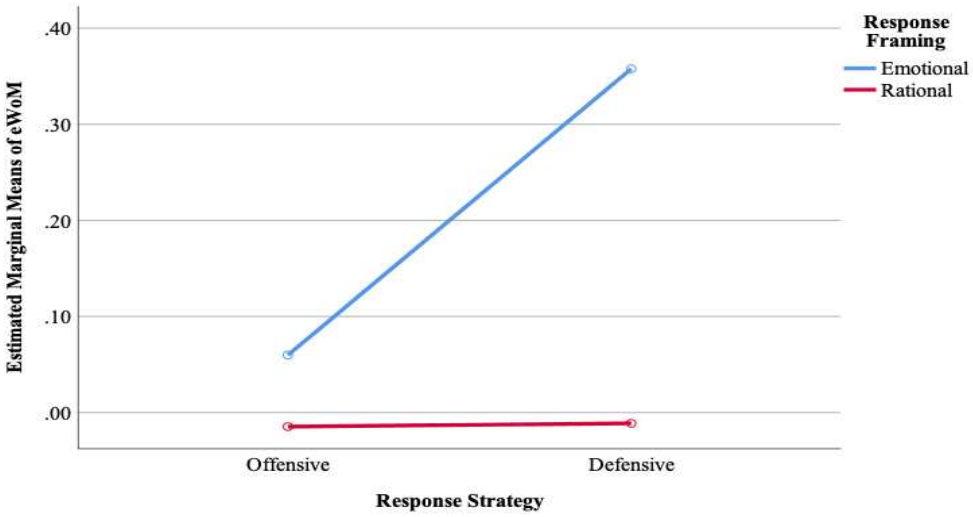

Figure 3. Two-way interaction effect of corporate crisis response strategy and corporate crisis response framing on E-WoM

These findings offer novel evidence of the positive impact of utilising a defensive response strategy, when announcing corporate responses to COVID-19 on social media, as consumers had a negative disposition towards offensive announcements during the pandemic crisis. The analysis points out that emotionally framed, corporate crisis responses can provide a significant advantage over rational announcements, with regard to acquiring positive consumer E-WoM. Our result also suggests that corporations should produce crisis responses which extensively utilise a defensive strategy with an emotional focus to improve consumer E-WoM during public health crises.

To check the robustness of our findings, we considered the impact of response timing on the proposed relationships in our model. The results are discussed in Appendix D.

5. Study 2

5.1. Experiment Design

Study 2 builds upon the results of Study 1, by investigating changes in consumers' trust towards different crisis response strategies and framing, formulated by the food retailer brands. We use experimental design procedures to exclude potential factors that might confound the results such as the established impression of a brand (Aguinis and Bradley, 2014). In particular, following guidance provided by Aguinis and Bradley (2014), an experimental vignette methodology (EVM) study is designed and implemented.

Adopting EVM to further examine the hypotheses is appropriate for this study because it is important to exercise control of the interactive effects of two independent variables (i.e. *corporate crisis response strategies and response framing*) when gathering evidence about causation (Aguinis and Bradley, 2014). That is, examining whether the interface between corporate crisis response strategies and framing has a causal relationship with changes in consumer trust. In addition, the context of this study focuses on the social media announcements of food retailers and reactions of consumers in tweets. Adopting an online questionnaire to present the vignettes for simulating social media announcements has strong similarity with the natural setting, as customers normally read tweet messages from either a computer or mobile phone. Therefore, EVM is a suitable approach for this study (Lohrke *et al.*, 2010). As shown in Appendix E, a three-stage experiment was designed to consider the vignettes of crisis situations and tweet responses associated with a UK food retailer.

5.2. Data Collection

The sampling frame of the experiment is UK residents who shop with UK food retailers and are familiar with the use of social media. We developed a set of filter questions to assess social media familiarity, as well as social media usage, to qualify the respondents and ensure that the presented scenario was familiar to them, thereby ensuring internal validity (Aguinis and Bradley, 2014). Respondents were asked to respond on a yes-no question (i.e. *I am familiar*

with the use of social media platforms for information searching and online communication, such as Facebook, Twitter and Instagram) (Gefen et al., 2003). Respondents were asked "how much time, on average, do you spend on social media each day?" with ordinal scale (0=don't use social media daily; 1=Less than 1 hour; 2=1-3 hours; 3=3-5 hours; 4=5-10 hours; 5=more than 10 hours). All respondents were familiar with social media and use social media daily. All respondents were used social media daily, with 86.59% of them indicating that they used social media for at least one hour per day. 180 respondents were recruited from the author's social media networks (n=85, 47.5% of the entire sample) and Amazon Mechanical Turk (n=94 or 52.5% of the entire sample). We used a *t*-test to check for significant differences between the various recruitment methods. The results (see Appendix F) indicate that there are no significant differences for (1) demographic background (i.e. gender and age), (2) frequency of daily social media usage and (3) their baseline trust towards the brand across the two different recruitment methods.

The respondents' profiles across eight scenarios are summarised in Table 2. Chi-Square analysis examined the randomisation across experimental conditions. The results indicate that the gender ratio [$X^2(7, N = 179) = 11.9609$, p= .102] and the respondents' age group [$X^2(14, N=179) = 31.1440$, p= .311] are not significantly different across eight vignettes.

Table 2. Demographic Profiles of Respondents and Manipulation Check Results

Combinations of the scenarios	Scenario 1: Product shortage				Scenario 2: Social distancing policy				**Total**
	Defensive x Emotional	**Offensive x Emotional**	**Defensive x Rational**	**Offensive x Rational**	**Defensive x Emotional**	**Offensive x Emotional**	**Defensive x Rational**	**Offensive x Rational**	
Gender									
Female	54.55%	52.38%	50.00%	68.18%	36.00%	27.78%	41.67%	51.85%	48.04%
Male	45.45%	47.62%	50.00%	31.82%	64.00%	72.22%	58.33%	48.15%	51.96%
Age									
18-24	22.73%	19.05%	10.00%	27.27%	40.00%	11.11%	41.67%	33.33%	26.82%
25-34	63.64%	57.14%	40.00%	36.36%	32.00%	50.00%	16.67%	44.44%	41.90%
> 35	13.63%	23.81%	50.00%	36.37%	28.00%	28.89%	41.66%	22.23%	31.28%

5.3. Dependent Variable

In Study 2, the dependent variable is the recovery of trust from a corporate service failure associated with the COVID-19 crisis. Consumer trust recovery was operationalised as the trustworthiness level at the different stages of the crisis (baseline, during crisis, and after seeing tweets). We directly adopted an existing scale: *(a) "I trust this brand." (b) "This brand is reliable." (c) "This brand is honest with me." (d) "This brand is safe."*. This scale was developed by Chaudhuri and Holbrook (2001). The measurement items were assessed through the five-point Likert scales on which '1' indicated "strongly disagree" for Stage 1 and Stage 3, with all measurements following the crisis vignettes. The trustworthiness scale of Stage 2 was reverse coded to check respondents' attention for the purpose of manipulation checks (Antonetti and Maklan, 2016). Across all three experimental stages, the trustworthiness items were highly correlated and were reliable. Cronbach's alphas α and means, as well as standard deviation (SD) for trustworthiness at all stages and vignettes, are presented in Table 3.

Table 3. Trustworthiness of brands across three different stages and vignettes

	Stage 1 Baseline	**Stage 2 During Crisis**	**Stage 3 After Tweets**
Scenario 1 Product shortage (n = 85)	3.83 (0.62) [0.91]	2.45 (0.81) [0.91]	4.02 (0.70) [0.94]
Scenario 2 Social distancing (n = 94)	3.79 (0.71) [0.90]	2.41 (0.75) [0.85]	3.76 (0.66) [0.90]
Emotional Framing (n = 86)	3.90 (0.64) [0.90]	2.31 (0.73) [0.88]	4.09 (0.62) [0.92]
Rational Framing (n = 93)	3.72 (0.68) [0.91]	2.54 (0.81) [0.88]	3.69 (0.69) [0.91]
Defensive Strategy (n = 88)	3.79 (0.62) [0.92]	2.40 (0.72) [0.89]	3.83 (0.65) [0.93]
Offensive Strategy (n = 91)	3.82 (0.71) [0.89]	2.46 (0.83) [0.87]	3.93 (0.72) [0.91]
Average (n = 179)	3.81 (0.62) [0.91]	2.43 (0.72) [0.88]	3.88 (0.65) [0.92]

Note: standard deviation in parentheses; Cronbach's alpha in brackets.
Paired sample *T*-test between two Scenario groups: Baseline: [$t(177) = -0.48$, $p = 0.63$]; During Crisis Vignette [$t(177) = 1.38$, $p = 0.17$]; After Tweets [$t(177) = 1.90$, $p = 0.06$]

5.3. Results and Discussions

The experiment was designed to scrutinise how corporate social media announcements influence consumer trust recovery during a public health crisis and subsequently, after

corporate tweet intervention. The two different crisis scenario groups did not significantly differ regarding the trustworthiness scores at all three stages. The results of three paired samples *T*-test comparing two scenario groups are presented in Table 3.

Consumer trust declined significantly between Stage 1 (baseline) and Stage 2 (during the crisis) scenarios of product shortage, $t(91) = 10.86$, $p < 0.001$, and social distancing, $t(86) = 11.07$, $p = < 0.001$. Following the design of Van Norel et al. (2014) in their study of damaged corporate reputation, we tested the overall efficiency of using tweets to communicate with customers and recover trust that was damaged during the COVID-19 crisis. On average, customer trust recovers significantly and the use of appropriate tweet communication can build trust to levels which are higher than pre-crisis levels $t(178) = 16.13$, $p < 0.001$.

To test the hypothesis in Study 2, we conducted 2 (response strategy) x 2 (response framing) ANOVA with crisis scenario (product shortage and social distancing) as a control variable. First, we expected the use of defensive and offensive crisis response strategies to have significantly different impacts on trust recovery. However, our analysis rejected H4, as a defensive crisis response strategy did not result in greater consumer trust recovery compared to an offensive response strategy $F(1, 178) = 0.00$, *n.s.*, $\eta^2 = 0.00$. Second, the main effect for the response framing group was significant, $F(1, 178) = 11.37$, $p<0.001$. Respondents exposed to tweet announcements with an emotionally framed response have significantly greater consumer trust recovery than those exposed to a rationally framed, corporate crisis response. More specifically, the tweets framed in an emotional manner enabled the trustworthiness scores to recover from 2.31 to 4.09, while those framed in a rational manner improved the trustworthiness score from 2.54 to 3.69. Interestingly, a rational crisis framing response did not result in customer trust recovering to a pre-crisis level, while an emotional crisis framing response led to trust levels that were stronger than pre-crisis levels. Therefore, H5 is supported.

Finally, as implied by H6a, the response framing x response strategy interaction was significant, $F(1, 178) = 18.60$, $p<0.001$, $\eta^2 = 0.07$. According to simple effect analysis, we find that a corporate crisis, defensive response strategy communication announcement on twitter, which is framed in an emotional way, will result in higher levels of trust recovery than an announcement framed in a rational manner. There is a significant effect of response framing for a defensive strategy, $F(1, 174) = 24.25$, $p < 0.001$. On average, the defensive response strategy with rational framing increased trustworthiness scores from 2.75 to 3.58 (i.e. trust recovery=0.83), while the trust recovery has a greater change (i.e. average consumer trust scores changed from 2.21 to 4.26) when the defensive strategy is framed in an emotional manner (i.e. trust recovery=2.05). However, as shown in Figure 4 of marginal mean of trust recovery, emotional framing and rational framing did not result in significant differences in trust recovery, when an offensive strategy was used in corporate tweet communications $F(1, 174) = 0.09$, $p = 0.76$. The trust recovery made by the offensive strategy with emotional framing is 1.41 (i.e. average consumer trust scores changed from 2.45 to 3.86) and with rational framing, is 1.48 (i.e. average consumer trust scores changed from 2.32 to 3.80). Thus, H6b is rejected.

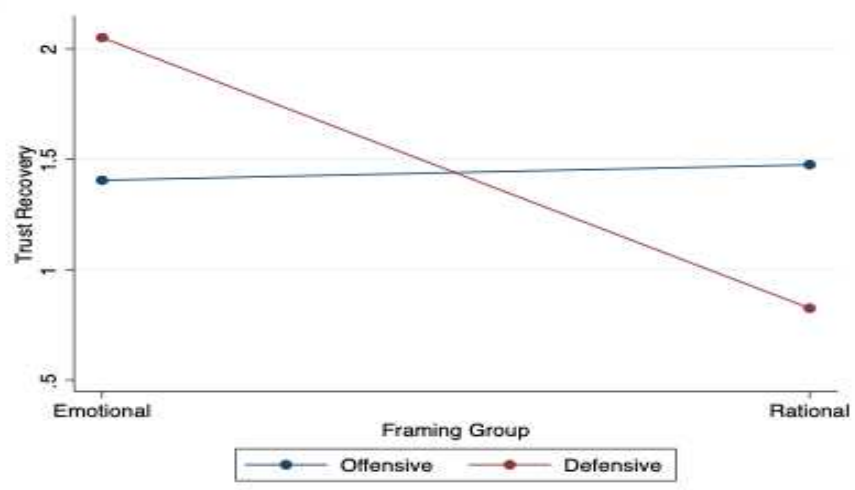

Figure 4. Two-way interaction effect of response strategy and response framing on trust recovery

6. General Discussion and Conclusion

Effective crisis communication responses are crucial for corporations seeking to successfully recover from service failures induced by a public health crisis. Our study sets out to explore how corporate crisis response strategy and response framing can be deployed to shape positive consumer E-WoM and rebuild consumer trust. Drawing upon the results of two studies, we answer three research questions. Theoretically, we provide new insights into corporate social media announcements in a public health crisis by analysing how response strategy (offensive versus defensive) and response framing (emotional versus rational) drive positive consumer E-WoM and trust recovery and by exploring the interaction effects between corporate crisis response strategy and framing. Methodologically, this paper makes a timely response to the recent calls for future research, focusing on service failure and recovery in a public health context which analyses rich social media collected from multiple, rather than single sources (Grégoire and Mattila, 2020; Khamitov et al., 2020). We also provide useful practical insights that will enable corporations to strategise crisis communication efforts in order to obtain positive consumer E-WoM and recover lost trust and highlight policy implications.

6.1. Theoretical Implications

The theoretical implications of this study to signalling theory and the service failure and public health crisis literature are threefold. First, although many studies adopting signalling theory have investigated the characteristics of signals (e.g. volume, timing, strength, clarity, and visibility) (Ni et al., 2016; Hsu and Lawrence, 2016), less attention has been paid to explore how to formulate signals effectively. To address this, our study builds on the extant service failure (e.g. Claeys and Cauberghe, 2014; Kharouf et al., 2020) and public health crisis (Bunker, 2020; Novelli et al., 2018) literature by highlighting the importance of strategising and framing

corporate signals in response to a global pandemic crisis. We further enrich the current literature by providing new evidence to show that a defensive response strategy, framed in an emotional manner, contributes to the formation of positive consumer E-WoM and the recovery of consumer trust during a public health crisis. This finding contrasts with prior research on service failure which concluded that rational framing would result in more positive, post-crisis consumer attitudes toward a corporation (Claeys and Cauberghe, 2014).

Second, understanding how receivers (i.e. consumers), translate signals into perceived meaning is considered to be one of the most important elements of signalling theory (Connelly et al., 2011). In contrast to previous studies which have examined consumers' interpretation of a service failure event by using the measurement scales of perceived service quality (Gijsenberg et al., 2015), attitude towards service (Liu et al., 2016) and satisfaction (Kharouf et al., 2020), we introduce E-WoM as a reflection of a corporation's crisis communication effectiveness in a public health crisis context. We do this by building upon research that has used social media data to investigate consumer E-WoM (e.g. Aleti et al., 2019; Wang et al., 2020). Our measurement of E-WoM allows researchers to better quantify consumer reactions and deeply capture consumers' positive, or negative, interpretation of corporate crisis communication responses during the pandemic. In doing so, we answer recent calls for further research (Grégoire and Mattila, 2020) which suggest using social media data to capture consumer reactions during a service failure.

Third, the signalling environment is one of the core components in signalling theory. Research on public health crisis communication has explored the effects of signalling in organisational and institutional environments. Yet, less attention has been paid to corporate crisis responses or the social media environment when addressing public health crises. By focusing on a social media environment, where signalling occurs in a noisier and more complex

context than previous research, we provide novel insights into the crisis communication literature by explaining the varied effects of signals on consumer reactions on social media.

6.2. Practical and Policy Implications

This study offers actionable corporate crisis communication strategies for practitioners and policy makers. More specifically, our findings offer support for campaigns which are similar to this and suggest that corporations should consider a shift in emphasis, away from traditional offensive and rational crisis communication responses, towards more defensive and emotional ones. By doing so, corporations will have a higher likelihood of service failure recovery, acquiring positive consumer E-WoM and rebuilding customer trust during and after a crisis. Indeed, the retailing sector has experienced the phenomenon of consumers stockpiling and bulk-buying during the early stages of the COVID-19 outbreak and consumers continue to be concerned for their safety. Crisis response campaigns may be employed to reduce consumers' anxiety and provide emotional support related to the crisis. A recent example is Cottonelle's 'ShareASquare' social media campaign. As a toilet paper producer, their campaign, in partnership with charities, delivers emotional messages on Twitter to encourage people to be generous during this frustrating time. Cottonelle donates US $1 when consumers use the hashtag #ShareASquare to share their announcements.

Second, COVID-19 has caused untold consumer suffering including financial difficulties, food shortages and long queues while shopping. With a lack of clear guidance on how to respond to customers, corporations could potentially lose consumer trust, even though they might be considered 'victims' (Coombs, 2007) since the crisis was not caused by them. Our findings provide insights into the effects of different corporate crisis responses, and therefore, offer direct guidance for corporations seeking to formulate appropriate communication strategies. To obtain positive E-WoM and restore consumer trust during the post-crisis period,

corporations should effectively utilise a defensive approach when developing response strategies. Moreover, social media environments provide flexible opportunities for corporations seeking to adjust and implement crisis response strategies. Our findings offer guidance to practitioners seeking to develop social media, crisis communication strategies in the food retailing sector and confirms that timely, corporate communication can generate attention and influence consumer reactions.

Third, our research also provides potential implications for UK policy makers who have been criticised by political commentators and others for presenting mixed messages relating to how to stay safe during the COVID 19 pandemic (Tolhurst, 2020). As some members of society have not been following social distance and other guidelines, a better understanding the types of interventions and public health messages that would lead to an increase in compliance is essential for policy makers (Norman et al., 2020). Our findings are closely aligned with the latest UK Parliament's COVID-19 Area of Interests - *communication strategy for public health messages* (Bermingham, 2020). Specifically, the findings obtained from this study can contribute to the discussion of the key research question - *"How do different approaches to communicating uncertainty affect people's likelihood to follow guidance?"* (Bermingham, 2020). Based on the empirical evidence we obtained, we suggest that policy makers should consider the potential effect of response framing when developing public health communication strategies shared in social media aimed at engaging citizens and encourage them to follow measures and guidance (e.g. social distancing or following self-isolation rules if they have potentially been exposed to the virus or abroad). We would encourage government authorities to carry out A/B testing and evaluate people's perceptions and attitudes toward public messages before releasing announcements on social media.

6.3. Limitations and Directions for Future Research

Several opportunities exist for future research that will help overcome the limitations associated with this study. Firstly, the single country and industry context of this study may mean our findings are not generalisable to other sectors or regions. It would therefore be valuable for future research to validate the current findings by collecting and analysing social media data from different business sectors in a broader range of countries or regions.

Second, although our selected outcome variables are valuable for achieving our research objective, they do not fully reflect the consequences of corporate crisis communication. Future research could explore additional potential consequences of corporate communication responses to public health crises such as how crisis communication strategies influence brand engagement or, in the longer term, have an impact on corporate financial performance (e.g. cash flow and actual sales).

Third, as this study merely considers response framing as the moderating role, research might further examine the contingent role of signalling in the signalling process. We hope that this study sparks future research on exploring various characteristics of signals such as consistency or enabling mechanisms of signalling process (e.g. consumer engagement and brand involvement). These characteristics and mechanisms might generate different influences when used by different senders on consumer behavioural outcomes.

Finally, the use of Twitter data alone may create a limitation as Twitter may provide different insights from other platforms such as Facebook, or online reviews, and does not capture all corporate communication signals. Although some researchers have claimed that brand-related sentiment in user-generated content does not differ across social networking sites (Smith et al., 2012), future studies which investigate the effect of corporate responses to public health crises on consumer sentiment across different social media platforms would be beneficial.

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Appendix A. Summary table of representative empirical studies of public health crisis communication

Studies	Type of public health crisis	Industry	Type of Research method	Data source	Underlying theoretical viewpoints	Empirical findings
Chong (2006)	Pandemic disease	Government	Case study	Secondary data	Data-driven	● Leverage the credibility of health authorities in communicating about crises ● Internal communication is crucial to building trust
Leidner et al. (2009)	Pandemic disease	Government	Cast study	Interviews; secondary data	Resource based view; coordination theory	● Information technology capabilities are critical during crisis response ● The crisis response organisational, informational, and IT structures, are important facilitators of the response actions
Liu et al. (2016)	Highly infectious agent	Cruise industry	Quantitative	169 participants exposed to different crisis communication messages	Extended Parallel Process Model	● Confirm the effect of crisis communication on people's risk perception, attitude, perceived safety and cruise travel intentions ● During the message consumption process, perceived safety mediated the relationship between perceived threat and behavioural intentions, and this mediating relationship was moderated by perceived efficacy
Malet & Korbitz (2015)	Bio terrorism	Government	Experiment study	Panel data collected from 43 emergency response professionals and public officials	Governmental risk communication	● It is important to maintain the mental and emotional health of response officials in a public health crisis ● The information related to bioterrorism should be provided to various agencies in a timely manner.
Novelli et al. (2018)	Epidemic disease	Government & tourism industry	Case study	Multiple data sources	Ritchie's tourism crisis and disaster management framework	● Government intervention represents an effective means of reducing short-term tourism losses and citizen anxiety ● Highlight the importance of two-way communication for all stakeholders
Riederer-Trainor et al. (2005)	Bio terrorism	Government	Case study	Interviews	Incident management system model	● Operationalise the incident management system-based response plan ● Issues related to internal and external communication among government agencies are reported.
Seo et al. (2014)	Highly infectious agent	Restaurant and food service industry	Quantitative	Data associated with 73 food crises	Situational crisis communication theory	● Corporate stock prices exhibited significantly negative responses to other firms' food crises ● The negative spillover effect is stronger closer to the time the crisis occurs
Tse et al. (2006)	Pandemic disease	Restaurant and food service industry	Case study	Secondary data	Data-driven	● Demonstrate the pathway of managing crisis response and tactics for restaurants ● Crisis communication to all the stakeholders needs to be proactive in dealing with a crisis
Page et al. (2006)	Pandemic disease	Government	Case study	Simulation data	Scenario planning approach	● Undertaken a scenario planning exercise to plan for future flu pandemics ● Two scenarios that explore potential issues and formulate proactive responses

						required at each stage of the pandemic crisis
Volo (2008)	Highly infectious agent	Tourism industry	Case study	Secondary data	Grounded theory	● Destination websites are an effective tool to communicate among the stakeholders during a public health crisis ● Both tourism authorities and marketers need to be involved in the communication to tourists

Appendix B. Categorising response strategy and framing by a three-step coding process

Following the guidelines proposed by Elo and Kyngäs, 2008, we use a three-step coding process of preparation, organising and reporting to categorise response strategies and framing. The first step was to learn what is going on and make sense of the coding process in terms of the coding unit of analysis, the level of analysis, and the purpose of evaluation. We selected tweet posts as the coding unit of analysis, looking primarily for the expressions of an idea: tweets relating to COVID-19 responses posted by corporations. The level of analysis in this study is the food retailers who post announcements on Twitter. The purpose of the coding process was to categorise the different types of response framing and response strategies for each announcement. After setting up the coding process, the next task was to define two types of response framing (Claeys and Cauberghe, 2014). We subsequently developed an explicit, coding instruction guideline that allows coders to be trained for the coding process. As suggested by Krippendorff (2012), our coding instruction guideline contained an outline, examples of the coding procedures, a guideline for using and administering the data sheets, and definitions and examples of different types of response strategy and framing (Krippendorff, 2012). Any potential confusion regarding classifications was addressed by providing detailed descriptions and examples.

In the second step, we recruited two independent coders who each have substantial research experience to categorise each corporate response to COVID-19 as an offensive or defensive strategy by using the dictionary of words related to the response strategy determined in the first step. We subsequently computed the frequency proportion of words belonging to either an offensive or defensive strategy divided by the total words of responses by using Kim and Kumar's (2018) classification approach. The same approach was also applied to classify response framing as emotional or rational messages.

In the final step, an audit was carried out and all classified responses double checked to improve the accuracy of classification (Krippendorff, 2012). Specifically, the two coders independently read the corporate responses to COVID-19, before coding them using the same process. The results from the first coder were compared with those of the second coder. Initially, the two coders agreed on 82.60% of the classifications, which exceeds the recommended rate of 0.70 (Miles and Huberman, 1994). Further assessment was performed on particular responses where agreement was not initially reached between the two coders. After discussion and debate, all the response classifications were accepted and agreed between the coders, ensuring inter-rater reliability (Aguinis and Solarino, 2019).

Table 1. Dictionary to categorise emotional framing, rational framing, offensive strategy and defensive strategy

	Emotional Framing	**Rational Framing**	**Offensive Strategy**	**Defensive Strategy**
Defining characteristics	Crisis response with emotional framing is designed to appeal to the emotions of the receiver by using drama, subjective, and evaluative properties	Crisis response with rational framing appeals to receiver's rationality by presenting information in an objective, informative, and straightforward manner	• Involves promoting both the brand name and the products or services of a corporation • Corporate marketing efforts are primarily concerned with promoting products and demonstrating higher levels of performance than competitors	It is often in the form of direct communication with individual customers to address their complaints, answer their questions, or simply socialise with them
Examples of Phrases and Keywords	Emotion symbols; thank you; hashtag count and mention count	Company updates; product/service information; measures and advice to customers	Product promotion; promoting brand image; explain pricing of certain items	Simply communicate with customers; maintain customer relationships; explain certain strategies that can cause inconvenience to customers.
Examples of Crisis responses	• Some little helps for safer shopping from some of our wonderful Tesco colleagues. #EveryLittleHelps • Stay safe and well and thank you for your ongoing support. • Thank you to our emergency workers, from everyone at Aldi.	• From today, all our stores (except Express stores) will be prioritising the elderly and most vulnerable for one hour between 9am and 10am every Monday, Wednesday and Friday. • Check your local store for exact times! • Prepared by our own Butchers, our local meat boxes are available for click and collect. No queues, a quick collection and strong social distancing measures in place. Order online now and check out our other boxes available to order.	• We are doing everything we can to ensure you and your families have the food and essentials you need. We ask everyone to shop as they normally would - there is enough for everyone. • We're installing new protective screens at all our store checkouts this week, to help keep our customers and our colleagues safe. • We are donating an extra £2m to support the British Red Cross so they can help the people currently most in need.	• We know that many of you are not getting as much access to our deliveries as you would like. So we wanted to explain what has been happening and what we are doing. Read about the changes, including how we're allocating our delivery slots • At a time like this, we need to work together. We're doing all we can to make sure communities have what they need, but we need your help too.

Appendix C. The measurement of E-WoM and control variables

E-WoM. It is measured using the average sentiment value of users' comments attached to corporate COVID-19 response announcements on Twitter. Specifically, we conducted a lexicon-based, sentiment analysis by using Semantic Orientation CALculator (SO-CAL) to calculate the average sentiment value of each consumer's tweet comments (Taboada et al., 2011; Lee et al., 2018b). SO-CAL can perform a polarity classification task where extracted user comments are assigned a positive or negative label to show how positive/negative a tweeted comment is (Taboada et al., 2011). In order to determine the sentiment value of the tweet comments, we annotated them using a dictionary from Hu and Liu (2004). Sentiment values ranged from -1 to 1, with 0 being neutral, 1 being the maximum positivity rating and -1 being very negative. If the sentiment value is positive, it indicates that consumer E-WoM towards a corporate announcement is positive.

As suggested in the product recall crisis literature (Thomsen and McKenzie, 2001), most market reaction occurs within six days after a crisis announcement date. We chose a six-day time frame, following a corporate COVID-19 response announcement, to collect consumers' comments. For example, if Tesco posted a COVID-19 response tweet on March 20th, 2020 (Day 0), user comments were collected between March 20th (Day 0) and March 26th (Day 6). In total, the dataset contains 21,960 consumer comments (replies) regarding 398 corporate COVID-19 response announcements within the time period.

Diversity of Corporate Response. Diversity of corporate response (for both strategy and framing) refers to the diversification of the corporate response announcements during a specific time period. We used the diversification measure developed by Powell et al. (1996) in the context of corporate response diversification. The diversity measure is equivalent to the Herfindahl-Hirschman index (HHI) (Shi et al., 2018), and its value is bounded in the interval [0, 0.5], with 0.5 indicating that corporate crisis responses are extremely diverse. In the extreme

case of response strategy (diversity value = 0.5), defensive and offensive response strategy would be equally adopted.

Each RS_i is squared and then the sum is taken over up to 2 and subtracted from 1, resulting in the index of diversity (Powell et al., 1996).

$$Diversity\ of\ Response\ Strategy = 1 - \sum_{i=1}^{2} RS_i^2$$

Where RS_i represents the proportion of response strategy out of total response strategies adopted by each corporation.

$$Diversity\ of\ Response\ Framing = 1 - \sum_{i=1}^{2} RF_i^2$$

Where RF_i represents the proportion of response framing announcements out of total response framings adopted by each corporation.

Response Intensity. Signal intensity can reasonably be expected to influence consumer behaviour (Lampel and Shamsie, 2000). Intensity of response (Gao et al., 2008) measures the frequency of COVID-19 announcements during a specific time period (i.e. the total volume of announcements by each corporation/61 days). Since the data covered two months (March and April 2020), a time period of 61 days was used.

Appendix D. Additional analysis to examine the impact of response timing on E-WoM

Situational Crisis Communication Theory (SCCT) suggests that the efficiency of corporate responses may differ at each stage of a crisis (Coombs, 2007). Similarly, signalling theory indicates that the timing of a signal's transmission is important as signalling at the right time can increase the attention receivers pay (Connelly et al., 2011). Thus, we examine the timing of corporate responses and their impact on E-WoM and further investigate how response timing varies in relationship to response strategies and response framing.

We develop two approaches to measure response timing. First, we record the timestamp of each corporate COVID-19 crisis announcement and match them by using the concept of adoption curve, provided by Rogers (2003). The announcements are categorised into frontier (2.5%), early responder (13.5%), early majority (34%), late majority (34%), and laggards (16%), then further re-categorised into two types: early response (frontier, early responder, and early majority), and later response (late majority and laggards). Second, we use the UK national lockdown date (the first-time lockdown was ordered on 23rd March) as a reference point. The corporate COVID-19 crisis announcements are divided into 'before lockdown' and 'after lockdown' groups. The results show that response timing does not directly influence E-WoM and the overall interaction effects between response timing, response strategy, and response framing in determining customer E-WoM are insignificant.

With this finding, we contribute to the literature by considering how crisis response timing should be contextualised. Crisis response timing is more relevant when health-related crisis is caused by an organisation (Huang and DiStaso, 2020) than in a context of an ongoing public health crisis. In comparison with the question of "when to respond", consumers are more concerned to the questions of "what to respond" and "how to respond" in corporate response to public health crisis. A possible reason for this discovery is that in the ongoing public health crisis like the COVID 19 pandemic, policy makers rather than corporations are the initial point

of communicating important information regarding health or social distancing and other guidance with the pubic. As such, the timing of corporate responses to public health crisis might not be perceived to be critical.

Table 1. The impact of response timing (earlier vs. later) on E-WoM

Dependent variable: E-WoM					
Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	10.218[a]	10	1.022	2.862	0.002
Intercept	2.287	1	2.287	6.405	0.012
Diversity of response framing	2.123	1	2.123	5.944	0.015
Diversity of response strategy	0.066	1	0.066	0.184	0.668
Intensity of response	3.094	1	3.094	8.663	0.003
Response framing	3.244	1	3.244	9.085	0.003
Response strategy	1.373	1	1.373	3.845	0.051
Response timing	0.329	1	0.329	0.921	0.338
Framing*strategy	1.465	1	1.465	4.103	0.043
Framing*timing	0.001	1	0.001	0.003	0.959
Strategy*timing	0.070	1	0.070	0.196	0.658
Framing*Strategy*Framing	0.001	1	0.001	0.002	0.961
Error	138.195	387	0.357		
Total	149.588	398			
Corrected Total	148.413	397			

a. R squared = 0.069 (adjusted R squared = 0.045)

Table 2. The impact of response timing (before lockdown vs. after lockdown) on E-WoM

Dependent variable: E-WoM					
Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	10.886[a]	10	1.089	3.063	0.001
Intercept	2.380	1	2.380	6.698	0.010
Diversity of response framing	2.222	1	2.222	6.254	0.013
Diversity of response strategy	0.079	1	0.079	0.222	0.668
Intensity of response	3.274	1	3.274	9.212	0.003
Response framing	2.984	1	2.984	8.396	0.004
Response strategy	1.570	1	1.570	4.417	0.036
Response timing	0.493	1	0.493	1.387	0.240
Framing*strategy	1.619	1	1.619	4.557	0.033
Framing*timing	0.032	1	0.032	0.090	0.764
Strategy*timing	0.001	1	0.001	0.003	0.954
Framing*Strategy*Framing	0.081	1	0.081	0.229	0.633

Error	137.527	387	0.355		
Total	149.588	398			
Corrected Total	148.413	397			

a. R squared = 0.073 (adjusted R squared = 0.049)

Appendix E. The three-stage experimental design for Study 2

In the first stage, respondents' perceptions of the trustworthiness of a brand were assessed as a baseline measurement (Stage 1 – baseline measurement). Then, in Stage 2 (during crisis) we asked respondents to read one of two randomly assigned COVID-19 crisis news items relating to product shortage and social distancing from a local newspaper and report their level of trust towards the brand. In Stage 3, to examine the influence of corporate crisis response strategy and response framing, the respondents were asked to read a randomly assigned tweet vignette and rate the brand's trustworthiness again after reading the tweet vignette.

As we observed on social media announcements by food retailers in Study 1, product shortage and social distancing measures were the most popular topics concerning supermarket communication. Two short news messages, derived from the actual cases representing product shortage and social distancing, were prepared using an 'actual derived cases' approach which presents lifelike scenarios to respondents in order to increase the generalisability of results (Aguinis and Bradley, 2014). In Stage 3, after the intervention of a randomly assigned tweet vignette, the respondents' feelings of brand trustworthiness were measured again.

Tweet vignettes were developed employing a 2 x 2 (defensive versus offensive corporate crisis response strategy) x (emotional versus rational corporate crisis response framing) design for both the product shortage and social distancing scenarios. Eight different tweet messages reflected the proposed crisis response strategy and framing combinations. To better manipulate the types of message, response strategies and framing, we carefully improved the presentation and wordings of the original tweets to represent precise, experimental cues. More specifically, emotional framing was manipulated based on emotional symbols and expressions of gratitude, while rational framing was manipulated based on presenting information in a straightforward, objective and informative manner (Claeys and Cauberghe, 2014; Stafford and Day, 1995; Yoo and MacInnis, 2005). With regards to corporate crisis response strategy, the use of an offensive

strategy was carefully manipulated to reflect the promotion of both the brand name and corporate products, or services, while a defensive strategy was manipulated to reflect direct communication with individual customers, aimed at addressing complaints, answering questions, or simply socialising with customers (He et al., 2018). The presentation of the tweet vignettes is consistent with Twitter's layout. An identical picture captured from Tesco's twitter account was used to accompany the predesigned text.

In a pilot test, the manipulations of the experimental cues were checked through four individual items for each tweet vignette (Rungtusanatham et al., 2011). More specifically, we asked the respondents (n=35) to rate the assigned tweet vignette through the following question items on a five-point Likert Scale (range from 1='strongly disagree' to 5='strongly agree'): a) The tweet you have read is framed in an emotional way (Emotional Framing); b) The tweet you have read is framed in a rational way (Rational Framing); c) The tweet you have read is making an announcement using a defensive strategy (Defensive Strategy); d) The tweet you have read is making an announcement using an offensive strategy (Offensive Strategy). The findings confirmed that the response framing and response strategies were manipulated as intended.

Any research using self-reported data can potentially suffer from common method bias (Podsakoff et al., 2003). Therefore an a priori method, where the dependent variable (customer trust of a brand) was presented on a different page of the online questionnaire to reduce the potential for common method bias was used (Hulland et al., 2018). The likelihood for common method bias was therefore mitigated by gathering data which measured the independent and dependent variables at two different points in time (Ho et al., 2014).

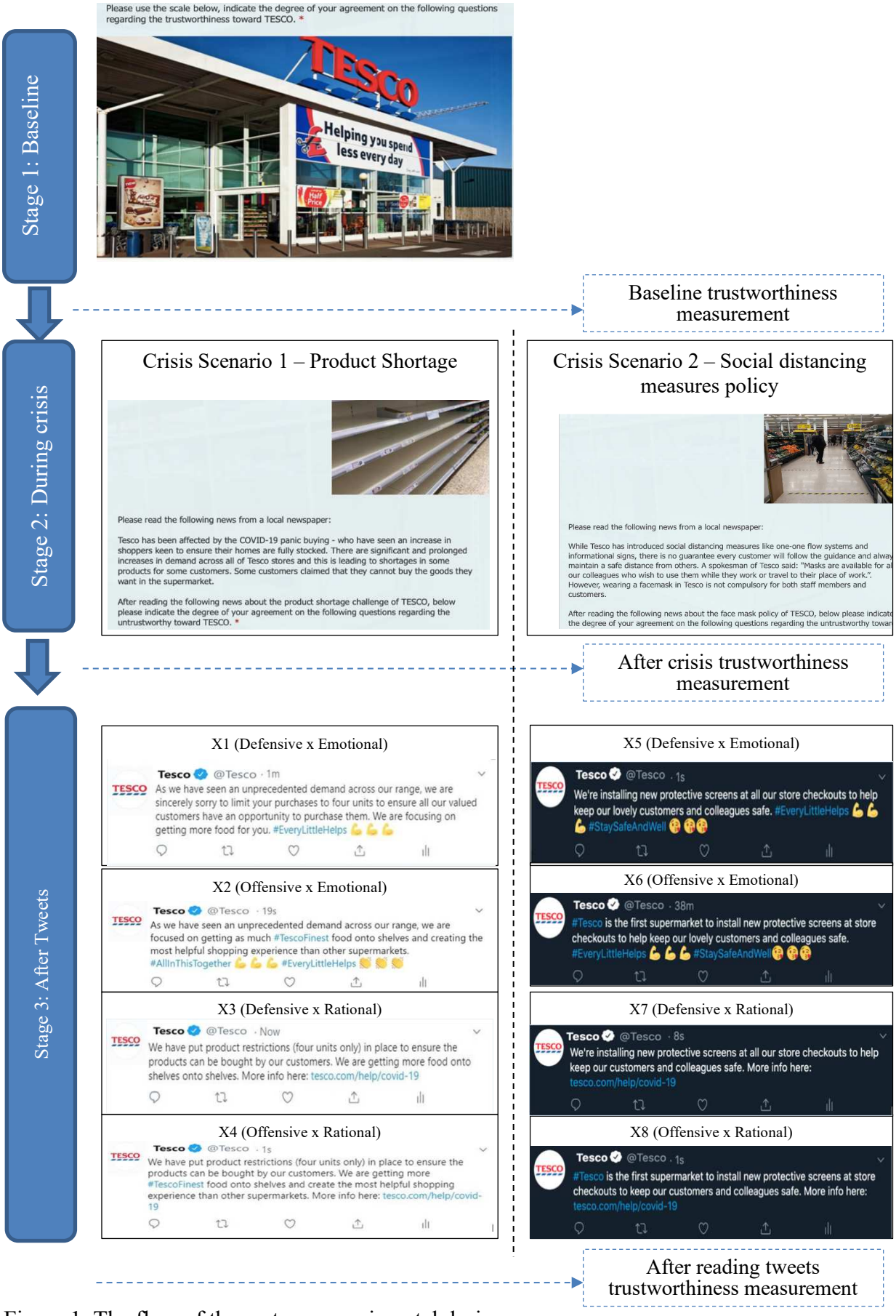

Figure 1. The flow of three-stage experimental design

Appendix F. T-test for the difference between the different recruitment methods

Variable	Mean Difference	p-value	Std. Error Difference	95% Confidence Interval of the Difference	
				Lower	Upper
Age	0.06658	0.6253	0.13609	-0.20199	0.35516
Gender	0.11789	0.1165	0.07473	-0.02958	0.26538
Frequency of daily social media usage	-0.06520	0.6383	0.13849	-0.33851	0.20811
Baseline trustworthiness	-0.08222	0.4758	0.11507	-0.30931	0.14485