"If Only…": Customer Counterfactual Thinking in Failed Recovery

Purpose - Our goal is to examine counterfactual thinking as a key mediator of effects of failed recovery (vs. failed delivery) on negative electronic word-of-mouth (eWOM). We further investigate the effectiveness of using recovery co-creation in minimizing customers' counterfactual thinking.

Design/methodology/approach - This research includes textual analysis of online reviews (Study 1) and three scenario-based experiments (Studies 2, 3a, and 3b). In addition to using item-response scales, we analyze negative online reviews and participants' open-ended responses to capture their counterfactual thinking.

Findings - Failed recovery (vs. failed delivery) increases counterfactual thinking, which in turn increases negative eWOM. These mediating effects of counterfactual thinking are consistent across textual analyses and experimental studies, as well as across different measures of counterfactual thinking. Counterfactual thinking also impacts customer anger in experiments; however, anger alone does not explain the effects of failed recovery on negative eWOM. Counterfactual thinking can be minimized by co-created recovery, especially when it is used proactively.

Practical implications - Our findings demonstrate the detrimental effects of counterfactual thinking and offer managerial insights into co-creation as a strategy to minimize customers' counterfactual thinking. We also highlight the importance and ways of tracking counterfactual thinking in digital outlets.

Originality/value - We contribute to counterfactual thinking and service recovery research by demonstrating the effects of failed recovery on counterfactual thinking that in turn impacts negative eWOM and offering a novel way to measure its expression in online narratives. We provide guidance on how to utilize co-creation in the service recovery process to minimize counterfactual thinking.

Keywords: Counterfactual thinking, Double deviation, Service recovery, Co-creation, Word-of-mouth (WOM), Compensation
Article classification: Research Paper

"We waited for almost an hour for two dry burgers. When we mentioned it to the manager, she was unnecessarily aggressive and not supportive. We would not be disappointed if she could address the issue better."

AG, TripAdvisor

Service failures are a growing concern because, increasingly, customers take out their responses to these failures to the public domain by sharing their experiences through negative electronic word-of-mouth (eWOM). Prior research has identified damaging effects of negative eWOM on sales and brand reputation (Berger and Milkman, 2012; Herhausen *et al.*, 2019); yet, the majority of research has been done in the context of service delivery failures (e.g., Strizhakova *et al*., 2012; Umashankar *et al.*, 2017). Service failures are especially problematic when a failed delivery is followed by a failed recovery, producing a 'double deviation' effect (Joireman *et al.,* 2013). About 96% of online revenge cases occur following a failed recovery (Grégoire *et al*., 2009), and prior research suggests a basic customer response model in which a failed recovery intensifies anger and elicits revenge (Joireman *et al.*, 2013). However, considering the detrimental effects of failed recovery, a recent review on brand transgressions and service failures (Khamitov *et al.*, 2020) called for further investigation and a deeper understanding of consumer responses (cognitive, emotional, and behavioral) and managerial strategies in response to failed recovery.

To address this call, we focus on developing a better understanding of the process that provides explanation of failed recovery effects on the negative outcomes and make four contributions to consumer and service research. First, a failed recovery is an intensified unfair situation where the service provider fails to meet customer expectations twice, both in delivery and attempted recovery. When facing such unfair situations, customers are likely to speculate

about what could or should have happened if the provider's response was different from reality (as evidenced in the above quote). This mental simulation that highlights the discrepancy between the outcome that did occur and the outcomes that might have occurred is referred to as counterfactual thinking (Folger and Cropanzano, 1998, 2001; Roese, 1997). When counterfactual thinking is triggered, individuals are likely to feel angry (McColl-Kennedy and Sparks, 2003) and punish the perpetrator more severely (Macrae *et al.*, 1993). Our research brings a more nuanced understanding of the role of customer counterfactual thinking as a cognitive response and process that explains effects of failed recovery on customers' negative response toward the service providers.

Second, we extend prior research on customer counterfactual thinking that mainly focused on its effect on negative emotions (e.g., anger; McColl-Kennedy and Sparks, 2003; Sparks, 2002) to explore its effect on negative eWOM as a form of punishment to restore the fair exchange relationship. Although unhappy customers have always discussed their negative experiences with friends and family, social media and other digital outlets allow customers to share their experiences and voice their thoughts to a larger and more diverse audience (Liu *et al.*, 2021; van de Ven and Zeelenberg, 2015). As such, negative eWOM has more damaging effects than traditional WOM because of its power to damage the firm reputation and hurt sales (Moe and Trusov, 2011). We contribute to both failed recovery and counterfactual thinking research by highlighting counterfactual thinking as the underlying process that transmits the effect of failed recovery on negative eWOM in addition to and accounting for its effects on anger. Hence, we offer a more nuanced understanding of how failed recovery elicits negative behavioral responses (i.e., negative eWOM) via both cognitions and emotions.

Third, we contribute by identifying proactive and reactive co-creation (i.e., involving customers into service delivery and recovery) as an effective recovery strategy that firms can use to minimize counterfactual thinking and restore fairness. Our approach echoes the pioneering research (Sparks and Fredline, 2007) that has pointed out that counterfactual thinking can be minimized by effective recovery strategies (e.g., providing an appropriate explanation about the failure), and advances the increasing academic and managerial attention of incorporating co-creation as an important strategy to reshape customer perceptions of (un)fairness (Wei *et al.*, 2019). Prior research provides mixed findings in relation to effectiveness of co-creation in service recovery (Van Vaerenbergh *et al.*, 2018). We contribute by outlining the significance of co-creation in failed recovery in minimizing counterfactual thinking, especially when it is done proactively (i.e., during the recovery that is to fail).

Finally, we contribute to a growing research stream on counterfactual thinking in the marketing field by demonstrating that counterfactual thinking can be measured with various instruments. We examine counterfactual thinking as an overt expression in online reviews by using LIWC (2015) dictionary (Pennebaker *et al.*, 2015), and in scenario-based experiments by using both item-response and open-ended measures. Even though counterfactual thinking is an internal cognitive process, we propose that it can be visible to service providers in digital outlets and suggest a new approach of tracking and capturing its expression in reviews. Importantly, such diverse measures of counterfactual thinking not only provide a stronger validity to our findings but importantly contribute to a prior dialogue on the use of various measures and their effects (Nicklin *et al.*, 2011).

We first provide an overview of the fairness theory and research on counterfactual thinking, and establish relationships between counterfactual thinking and negative eWOM, failed

recovery, and recovery co-creation. We present an overview of our studies, report on each study, and conclude with implications and future research recommendations.

Theoretical background and hypotheses development

Fairness theory and counterfactual thinking

Customers view their interaction with a firm as an exchange process. They strive to achieve a fair exchange and foster reciprocity during the interaction, which is related to individuals' desire to be valued and respected (Kaltcheva *et al*., 2013). Fairness theory (Folger and Cropanzano, 1998, 2001) focuses on mental processes involved in evaluating other individuals' responsibility for adverse events, such as service failures (McColl-Kennedy and Sparks, 2003). To assess the fairness of a given event, individuals might think about alternative outcomes that could have occurred if others' conduct had been different and compare those outcomes to the actual results (Folger and Cropanzano, 2001; Roese, 1997). These judgments involving contrastive alternatives trigger three types of thoughts. *Would* thoughts determine the level of harm by establishing how the outcome would have been different if there had been no failure. *Could* thoughts determine the accountability for the outcome by assigning an external party as a judgment target for the failure. *Should* thoughts assess justice/injustice by evaluating whether the failure violates any ethical norms. Such would, could, and should thoughts discussed in the fairness theory mirror customers' counterfactual thinking, or a type of mental simulation that highlights the discrepancy between the outcome that did occur to the outcomes that might have occurred.

Counterfactual thinking drives individuals' negative emotional and behavioral responses to stressful events (Roese and Olson, 1997) as a means of understanding what might have been done to avoid the adverse outcome (Page and Colby, 2003; Wang *et al.,* 2017). Marketing research has started to examine counterfactual thinking as a cognitive frame in response to

service failures because it makes customers think more about the unexpected results versus possible alternatives (McColl-Kennedy and Sparks, 2003). This line of research finds that failed service delivery (i.e., failures in delivering service and meeting fair exchange expectations) generally and more severe delivery failures specifically are important triggers of counterfactual thinking (Chan and Ngai, 2010; Nicklin *et al.*, 2011; Sparks, 2002; Sparks and Fredline, 2007; see Table 1 for a summary of prior research on counterfactual thinking in marketing research); yet, it remains unclear whether failed recovery – an increasingly growing phenomenon (Khamitov *et al.*, 2020) – can further contribute to increased counterfactual thinking beyond the identified effects of failed service delivery and its severity.

Similar to the detrimental effects of counterfactual thinking in interpersonal relationships, customer counterfactual thinking impacts customer-firm outcomes. It decreases satisfaction (Galinsky *et al.*, 2002; Yoon and Vargas, 2010), increases anger (McColl-Kennedy and Sparks, 2003; Sparks, 2002), regret (Park and Jang, 2018), and customers' scrutiny over the subsequent promotional information (Krishnamurthy and Sivaraman, 2002, Table 1). However, behavioral consequences of counterfactual thinking, particularly a growing and damaging phenomenon of eWOM (Chevalier and Mayzlin 2006; Moe and Trusov, 2011; van de Ven and Zeelenberg, 2015), remain underexplored and reveal important academic and practical gaps.

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Failed recovery and counterfactual thinking
When service failures happen, customers believe that firms are morally obligated to rectify them to cover their economic (e.g., money) and social (e.g., status, esteem) losses, and this belief is violated when the firm fails for the second time in the recovery process (Tripp and Grégoire,

2011). Hence, failed recovery is not simply a more severe failure. Importantly, it also signals a lower level of a firm's commitment to treating customers fairly and triggers a violation of individuals' perception of fairness in interactions (Skarlicki *et al.,* 2008). During recovery, service firms have more opportunities to address unfairness created by the initial failure and to prevent the second failure from happening (Page and Colby, 2003). As such, failed recovery sends a strong signal that the firm cares very little about its customers and is less committed to delivering fair service experiences to its customers, widening the discrepancy between the expected outcome and the actual outcome. This greater discrepancy makes customers engage in more elaborate cognitive comparisons between these outcomes. We hypothesize:

H1. Failed recovery (vs. failed service delivery) increases counterfactual thinking.

Effects of counterfactual thinking

In the modern digitalizing marketplace, approximately 42% of customers share their negative experiences online (Hyken, 2018) and negative eWOM is one of the greatest threats to service providers (Moe and Trusov, 2011). Because of its visibility, negative eWOM can have long-term negative effects on firm sales and reputation (Chevalier and Mayzlin 2006). When counterfactual thoughts accumulate, a psychological discomfort occurs that requires some type of coping (Epstude and Roese, 2008). This coping is necessary to reduce negative emotions and restore perceptions of fairness created by counterfactual thinking. More importantly, individuals who engage in counterfactual thinking after a stressful event tend to punish the perpetrator (Macrae *et al*., 1993), and digital outlets offer an avenue for customers who experience a service failure to voice their thoughts through negative eWOM as a form of firm punishment (Chevalier and Mayzlin 2006; Joireman *et al*., 2013). Sharing negative eWOM is also an expressive coping strategy that reduces tensions in customers' mind (Strizhakova *et al*., 2012; van de Ven and

Zeelenberg, 2015; Wang *et al*., 2017). Additionally, recent research suggests that counterfactual thinking elicits individuals' social sharing (Özbek *et al.*, 2018). Hence, we hypothesize:

H2. Counterfactual thinking increases customers' negative eWOM.

As discussed earlier, when failed recovery happens, customers tend to engage in counterfactual thinking as a means of evaluating potential alternative scenarios that would have / could have / and should have happened. Therefore, counterfactual thinking functions as a conveying cognitive process between failed recovery and negative eWOM.

However, prior service research has identified anger as a frequent outcome of counterfactual thinking in failed delivery (McColl-Kennedy and Sparks 2003; Sparks 2002). Anger also plays a powerful role in increasing retaliatory behaviors, including negative WOM following failed recovery, and is a frequent mediator of effects of various contextual factors of service failures on behavioral outcomes (Joireman *et al*., 2013; Strizhakova *et al*., 2012). Concerning digital outlets, prior research also suggests that anger elicited by service failures drives customers' social sharing (López-López *et al*., 2014; Wetzer *et al*., 2007). Hence, we expect anger to be an additional mediator of the effects of counterfactual thinking and failed recovery on negative eWOM. We hypothesize:

H3. Failed recovery increases negative eWOM via counterfactual thinking and anger; namely, failed recovery increases counterfactual thinking that in turn impacts anger and negative eWOM.

Recovery co-creation and counterfactual thinking

Despite the negative emotional and behavioral effects of counterfactual thinking, research on providers' strategies to minimize counterfactual thinking in response to service failures is surprisingly scarce. Sparks and Fredline (2007) conclude that when a severe service delivery

failure happens, providing an appropriate explanation about the failure reduces counterfactual thinking. In the tourism context, Park and Jang (2018) find that when the temporal distance between purchase date and travel date is distant, the traveler's counterfactual thinking decreases as the discount rate increases. However, with the development of self-service technologies, a new and growing form of recovery known as co-creation has emerged, in which customers are actively involved in the recovery process (Roggeveen *et al.*, 2012; Xu *et al.*, 2014). Prior research has found that co-creation in service delivery helps firms meet customers' needs effectively and improves fairness perceptions (Payne *et al*., 2008; Witell *et al.*, 2011); it enhances customer engagement and empowerment (e.g., Xu *et al*., 2014; Zhao *et al.*, 2018) and satisfaction (Meuter *et al*., 2000). However, despite these promising effects of co-creation, Heidenreich *et al.* (2015) find that co-creation increases customer's negative disconfirmation and dissatisfaction when a delivery fails.

In relation to recovery, co-creation means proactive involvement of customers in collaboration with the service provider and shared responsibility of outcomes (Roggeveen *et al*., 2012). From the fairness perspective, when customers co-create recovery, they view the recovery outcome, the process leading to the outcome, and the way that they are treated, more equitably. By involving customers in recovery (e.g., showing customers possible solutions, consulting them regarding what they think, and discussing the feasibility of solutions with them), providers offer some control to customers that appear to alleviate customers' negative evaluation of undesirable recovery outcomes (Dong *et al*., 2008; Xu *et al*., 2014). When a service failure occurs, customers generally attribute failures externally (i.e., to firms) (Folkes, 1988); however, when co-created failure happens, customers are more willing to share the blame (Mattila and Patterson, 2004).

Consequently, co-creation may reduce customers' perception of unfairness when recovery fails. We hypothesize:

H4a. Failed recovery with co-creation (vs. failed recovery without co-creation) decreases counterfactual thinking.

Although failed recovery triggers a negative response, firms can still have a second chance to rectify the situation. Firms often offer various types of compensation (Roschk and Gelbrich, 2014; Joireman *et al*., 2013), and providing compensation is considered the most effective tactic in restoring satisfaction after failed recovery (Johnston and Fern, 1999). However, although service firms and the existing research tend to focus more on the monetary value of compensation, *how* monetary compensation is offered also impacts recovery effectiveness (Roschk and Gelbrich, 2014).

Allowing customers to choose their compensation preference represents a type of co-creation that influences customers' evaluation of firms' recovery efforts (Mattila, 2010). When individuals are given a choice, they tend to believe that they can control the outcome. From a fairness angle, compensation acts as a form of instant economic value in the mental accounting of a service experience (Kim and Ulgado, 2012; Liu *et al*., 2019) that would sidetrack customers' perceived unfairness and reduce perceived losses. Customers who are allowed to select a specific recovery solution from options offered by a firm (e.g., choosing from several compensation methods) are more likely to believe they can achieve their desired outcome than those who have no choice (Van Vaerenbergh *et al*., 2018). We hypothesize:

H4b. After a failed recovery, counterfactual thinking is weaker for customers who are provided with compensation options (i.e., co-creation) than for those who are provided with compensation with no options (i.e., no co-creation).

Figure 1 presents our conceptual model where we highlight the mediation role of counterfactual thinking (and anger) in the effect of failed recovery on negative eWOM. We further demonstrate co-creation both as proactive (i.e., at the point of recovery) and reactive (i.e., after the failed recovery) recovery strategies.

---------------- Insert Figure 1 about here ----------------

Overview of studies

We test our hypotheses across three different service sectors (restaurants, hotels, and airlines). In Study 1, using online reviews (TripAdvisor) of restaurants in London, UK; we examine the impact of failed recovery (vs. failed service delivery) on counterfactual thinking (H1) and the subsequent effect of counterfactual thinking on negative eWOM (H2). We measure counterfactual thinking using a linguistic indicator and also consider both counterfactual thinking and anger as mediators (H3). In Study 2, we retest H1-H3 using a scenario-based experiment in a restaurant context and measure counterfactual thinking using an item-response scale. Finally, Studies 3a and 3b evaluate the effects of recovery co-creation in scenario-based experiments and measure counterfactual thinking using both item-response and open-ended scales. In Study 3a (hotels), we examine failed recovery with and without co-creation (H4a); Study 3b (airlines) focuses on compensation with options (i.e., co-creation) versus without options (i.e., no co-creation) after failed recovery (H4b).

Study 1: Counterfactual thinking in online review data

Customers frequently write online reviews to share their thoughts, feelings, and service experiences they would want to avoid (Tausczik and Pennebaker, 2010). People who engage in counterfactual thinking are also likely to express this internal cognitive process in their written

narratives (e.g., Jing-Schmidt, 2017; Qin, 2013), including reviews. Hence, our goal in Study 1 is to examine relationships among failed recovery, counterfactual thinking, anger, and negative eWOM using online TripAdvisor (one of the most popular review platforms; Filieri *et al.*, 2015) reviews. We collected negative (1- and 2-star ratings) reviews (n = 350) of 10 restaurants that received the highest number of total reviews in London in the period 2016-2018. A crawler was used to download reviews, as well as collect restaurant names, review date, review texts, review rating, restaurant's overall rating, the total number of reviews for each restaurant, and reviewer's total contributions (i.e., number of reviews generated).

Measures

We coded reviews that discussed only the initial service delivery failure as 0 and reviews that discussed both a failed service delivery and a failed recovery as 1 (Grégoire *et al.* 2009, see coding examples in Table 2). Two independent coders were instructed in the coding procedures (intercoder reliability was high, r = .92, and differences were resolved through discussion). Reviews (n = 44) for which we could not clearly assess failure or recovery were omitted, reducing our sample to 306 reviews.

---------------- Insert Table 2 about here ----------------

We conducted textual analyses to measure the expression of *counterfactual thinking*. As counterfactual thinking highlights the discrepancy between actual and possible outcomes, counterfactual communication should be characterized by more discrepancy-related words, such as those in the "discrep" cognitive dimension in Linguistic Inquiry and Word Count (LIWC, Pennebaker *et al.*, 2015). "Discrep" has been used as a proxy for individuals' counterfactual thinking in written narratives; Carroll, 2013; Collisson *et al.,* 2018). The score is calculated based on the proportion of the frequency of the "discrep" word match. To make sure that

customers thought about better alternative outcomes if providers treated them differently, we measured the use of third-person pronouns (e.g., he, she, and they). We created individual z-scores for the three dimensions of discrepant words and third-person pronouns and averaged them into an aggregate measure of counterfactual thinking (see Gino and Ariely, 2012).

Any customer who wrote a low-ranked review on TripAdvisor inevitably generated negative eWOM. Therefore, we were not able to capture customers who were not involved in spreading negative eWOM. Instead, we measured the extent of negative eWOM by calculating the number of words in each review (Umashankar *et al.*, 2017). We measured customer anger using the existing dimension "anger" in LIWC. We used several controls that were identified as important in prior research: reviewer expertise (Nicklin *et al.*, 2011) measured by the average number of reviews that customers posted on TripAdvisor in their lifetime; the average rating, and the total number of reviews (Chevalier and Mayzlin, 2006).

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Results

We standardized all variables and conducted regression analysis with a bootstrapping procedure (PROCESS, Model 6, Hayes, 2013), including our controls. Consistent with H1, failed recovery (vs. failed service delivery) increases counterfactual thinking ($b = .54$; $p < .001$, see Table 4 for means and standard deviations by manipulated conditions across studies); counterfactual thinking increases negative eWOM ($b = .15$; $p < .001$), supporting H2, and anger ($b = .21$, $p < .001$) (Table 5). The indirect effect of failed recovery on negative eWOM including only counterfactual thinking is significant ($b = .08$ [95% CI: .03, .15]); however, the indirect effect of failed recovery on negative eWOM via counterfactual thinking and anger ($b = -.00$ [95% CI: -.02, .02]), and the indirect effect of failed recovery on negative eWOM via anger alone ($b = -.01$

[95% CI: -.02, .01]) are not significant. Hence, H3 is partially supported: failed recovery impacts

negative eWOM only via counterfactual thinking. The direct effect of failed recovery on

negative eWOM after including mediators remains significant (Table 5).

---------------- **Insert Table 4 and 5 about here** ----------------

Study 1 demonstrates that counterfactual thinking, failed recovery, failed service

delivery, customer anger, and negative eWOM can be expressed in online reviews. Negative

reviews that discuss failed recovery are more likely to have higher expressions of counterfactual

thinking, which, in turn, leads to greater negative eWOM and anger. However, anger does not

appear to impact negative eWOM.

Study 2: Counterfactual thinking in a scenario-based experiment

Our goal in Study 2 was to retest the relationship between failed recovery, counterfactual

thinking, anger, and negative eWOM using a scenario-based experiment. We recruited 200 U.S.

MTurk workers (six failed attention checks, final n = 194, M_{age} = 37.58; SD= 11.62; 58%

females) who were randomly assigned to one of two experimental conditions (service failure

type: failed recovery vs. failed service delivery). Participants were asked to engage in a role-

playing exercise by reading a hypothetical service failure scenario in a restaurant setting

(Appendix A). Manipulation checks came afterwards, followed by measures of counterfactual

thinking (2 items; Sparks and Fredline, 2007), anger (2 items, Joireman *et al.,* 2013), negative

eWOM (3 items, Strizhakova *et al.,* 2012), and our control variables: service failure severity (2

items, Smith *et al.,* 1999), and blame attribution (2 items, Maxham III and Netemeyer, 2002).

See Table 6 and 7 for items, loadings, means, validity testing, and correlations. Means and

standard deviations by condition are reported in Table 4.

---------------- **Insert Tables 6 and 7 about here** ----------------

Confirmatory factor analysis (CFA, AMOS 25) indicates a good-fitting measurement model (χ^2 = 41.75; df = 34; CFI = .98; TLI = .97; RMSEA < .05); scale items demonstrate necessary convergent and discriminant validity (Fornell and Larcker, 1981); the unmeasured common latent factor (CLF) approach (Podsakoff *et al.,* 2003) does not indicate issues with common method biases.

The failed recovery manipulation was successful: (Joireman *et al.* 2013; perceived level of problem resolution $M_{\text{Failed recovery}} = 2.36$; *SD*= 1.61 vs. $M_{\text{Failed service delivery}} = 4.72$; *SD*= 1.41, *t* (192) = 10.81, *p* < .001). All participants in the failed recovery condition indicated that there were two failures, whereas all participants in the failed delivery stated that there was only one failure. To assess scenario realism, we asked participants to indicate how realistic the scenario was (experimental realism) and to what extent the situation would happen to someone in real life (mundane realism) (Liao, 2007; Roschk and Kaiser, 2013): scenarios were experimentally (*M* = 5.93 and above mid-point 4.0; *t* (193) = 21.45, *p* < .001) and mundanely (*M* = 5.89 and above mid-point 4.0; *t* (193) = 21.54, *p* < .05) realistic.

The regression analysis with a bootstrapping procedure in PROCESS (Model 6, Hayes, 2013) demonstrates that consistent with H1 and H2, failed recovery (vs. failed service delivery) increases counterfactual thinking (*b* = .88; *p* < .001, see Table 4 for means by condition) and counterfactual thinking increases negative eWOM (*b* = .27; *p* < .001) (Table 8). Consistent with H3, the indirect effect of failed recovery on negative eWOM via counterfactual thinking alone is significant (*b* = .22 [95% CI: .08, .37]), and the indirect effect via both counterfactual thinking and anger is also significant (*b* = .07 [95% CI: .02, .13]); however, the indirect effect of failed recovery via anger alone (without counterfactual thinking) is not significant (*b* = .01 [95% CI: -

.14, .17]. The direct effect of failed recovery on negative eWOM after including mediators remains significant (Table 8).

<center>--------------- **Insert Table 8 about here** ---------------</center>

In an experimental setting, we support the mediating role of counterfactual thinking in the effect of failed recovery on negative eWOM. Consistent with prior research (McColl-Kennedy and Sparks 2003, Sparks 2002), anger can be an additional mediator of effects of failed recovery on negative eWOM; however, anger alone does not explain the effect of failed recovery on negative eWOM. Hence, counterfactual thinking is an important outcome of failed recovery that subsequently triggers both anger and negative eWOM.

Study 3: Co-creation in failed recovery and counterfactual thinking

Studies 3a and 3b focus on the effects of co-creation in minimizing counterfactual thinking in failed recovery. Studies 1 and 2 differed in their designs and measurements of counterfactual thinking. Prior research indicates that some differences in effects of counterfactual thinking can be explained by its measurement, such as item-response versus open-ended responses (Nicklin *et al.*, 2011). Because counterfactual thinking is a spontaneous thought process, we implemented scenario-based experiments with both item-response and open-ended measures of counterfactual thinking.

Study 3a: Proactive Co-creation in Failed Recovery

Study 3a focuses on the proactive use of co-creation in recovery and follows a single-factor (service failure type: failed service delivery, failed recovery with co-creation, failed recovery without co-creation) between-subjects scenario-based experiment. A sample of 213 U.K.

workers from Prolific participated in the study (M_{age} = 35.06; *SD*= 12.96; 71.8% females) and imagined that they experienced one of the scenarios with a hotel (Appendix B).

The failed recovery (vs. failed service delivery) manipulation was successful: participants' perceived problem resolution significantly lower after failed recovery with co-creation (*M* = 2.97; *SD*= 1.77) and failed recovery without co-creation (*M* = 2.52; *SD*= 1.58) than after a service delivery failure (*M* = 4.66; *SD*= 1.71, *F* (2, 210) = 32.96, *p* < .001). Our manipulation check of co-creation was also successful (Roggeveen *et al.* 2012; perceived level of involvement $M_{\text{failed recovery with co-creation}}$= 5.70; $SD_{\text{failed recovery with co-creation}}$= 1.18; $M_{\text{failed recovery without co-creation}}$ = 2.77; $SD_{\text{failed recovery without co-creation}}$ = 1.90; $M_{\text{failed service delivery}}$ = 2.35; $SD_{\text{failed service delivery}}$ = 1.70; *F* (2, 210) = 90.15, *p* < .001). Scenarios were experimentally (*M* = 5.53 and above 4.0; *t*(212) = 17.01, *p* < .001) and mundanely (*M* = 5.64 and above 4.0; *t*(212) = 16.73, *p* < .001) realistic.

To measure counterfactual thinking with an item-response scale, we used four items (Park and Jang, 2018) followed by an open-ended question that asked participants to write down their thoughts regarding how their situation could/should have been better if the firm had treated them differently (similar to Nicklin *et al.*, 2011). Two coders independently coded participants' responses to the open-ended question to calculate the number of counterfactual thoughts in each essay to measure counterfactual thinking (e.g., "*If the hotel had admitted its error in my booking, that would make me feel better about it*"; intercoder reliability was high [r = .91] and differences were resolved through discussion). Control variables were measured as in Study 2 (see Tables 6 and 7).

CFA (AMOS 25) indicates a good-fitting measurement model (χ^2 = 86.54; df = 55; CFI = .99; TLI = .98; RMSEA < .05). All scales demonstrate good reliability, as well as convergent and

discriminant validity (Fornell and Larcker, 1981; Table 6). Study 3a does not have issues with common-method biases.

We ran regression analyses with a bootstrapping procedure (PROCESS, Model 6, Hayes, 2013) for both the item-response and open-ended scales of counterfactual thinking. Because our independent variable was categorical with three conditions, we created two dummy variables: failed recovery with and without co-creation vs. failed delivery (consistent with H1) and failed recovery without co-creation vs. failed recovery with co-creation and failed delivery. Consistent with our prediction in H1, we first assessed the effect of failed recovery with and without co-creation versus failed delivery in our model, while covarying effects of the second dummy variable. Consistent with H1 and H2, failed recovery increases counterfactual thinking (item-response: $b = .57$; $p < .01$; open-ended: $b = .70$; $p < .001$), and counterfactual thinking increases negative eWOM (item-response: $b = .25$; $p < .01$; open-ended: $b = .20$; $p < .05$) (see Table 4 for means by condition). We also support H3: the indirect effect of failed recovery on negative eWOM via counterfactual thinking alone is significant (item-response: $b = .14$ [95% CI: .02, .29]; open-ended: $b = .14$ [95% CI: .01, .32]), the indirect effect via both counterfactual thinking and anger is also significant (item-response: $b = .04$ [95% CI: .01, .10]; open-ended: $b = .05$ [95% CI: .01, .11]), whereas the indirect effect via anger alone is not significant (item-response: $b = -.01$ [95% CI: -.12, .08]; open-ended: $b = -.02$ [95% CI: -.14, .11]). This pattern of mediation is consistent with Study 2. The direct effect of failed recovery on negative eWOM after including mediators becomes non-significant (Table 9a). The effect of failed recovery without co-creation versus the other two conditions on counterfactual thinking is also significant (item-response: $b = .53$, $p < .01$; open-ended: $b = .34$, $p < .05$). We ran similar analyses where we assessed effect of failed recovery without co-creation versus the other two conditions and covaried effects of failed

recovery without and without co-creation versus failed delivery. The pattern of results remained similar (Table 9b), suggesting differences in counterfactual thinking between failed recovery with and without co-creation.

<center>**---------------- Insert Table 9a and 9b about here ----------------**</center>

To further examine differences in counterfactual thinking following a failed recovery with (vs. without) co-creation (H4a), we conducted ANCOVA tests that demonstrate significant differences for both item response ($F(2, 208) = 12.47$, $p < .001$) and open-ended ($F(2, 208) = 22.35$, $p < .001$) measures of counterfactual thinking. Consistent with H4a, counterfactual thinking was lower after failed recovery with co-creation (item-response: $M = 5.51$; $SD= 1.19$; open-ended: $M = 1.51$; $SD= .76$) than after a failed recovery without co-creation (item-response: $M = 5.92$; $SD= 1.07$, $t(131) = 2.27$, $p < .05$; open-ended: $M = 1.86$; $SD= 1.11$, $t(131) = 2.10$, $p < .05$) but was higher than after a failed delivery (item-response: $M = 4.65$, $SD= 1.62$, $t(146) = 3.60$, $p < .001$; open-ended: $M = .94$, $SD= .93$, $t(146) = 4.07$, $p < .001$).

Similar to study 2, counterfactual thinking and anger mediate the effect of failed recovery on negative eWOM; however, anger alone (without counterfactual thinking) does not explain the effect of failed recovery on negative eWOM. Additionally, using co-creation in recovery helps minimize counterfactual thinking if recovery fails. The effects were consistent for both item-response and open-ended measures of counterfactual thinking.

Study 3b: Reactive Co-creation in Failed Recovery

Study 3b focuses on reactive co-created recovery (i.e., co-created recovery effort is made after the failed recovery). A sample of 260 U.K. Prolific panel members ($M_{age} = 38.98$; $SD=12.69$; 69% females), different from those in previous studies, participated in a single-factor (service

failure type: failed service delivery, failed recovery followed by recovery with co-creation; failed recovery followed by recovery with no co-creation) between-subjects scenario-based experiment. To manipulate recovery co-creation, we focused on compensation options. In the recovery with co-creation, participants were given a choice between the compensation of 2,000 miles that was worth about £30 or a £30 discount voucher that could be used for the next flight. In the recovery with no co-creation, participants were simply given *either* the compensation of 2,000 miles *or* a £30 discount voucher (Appendix C).

The failed recovery (vs. failed service delivery) manipulation was successful: participants' perceived problem resolution significantly lower after failed recovery with co-creation ($M = 3.50$; $SD= 1.52$) and failed recovery without co-creation ($M = 3.55$; $SD= 1.69$) than after a service delivery failure ($M = 4.98$; $SD= 1.90$, $F(2, 257) = 18.06$, $p < .001$).

Recovery co-creation manipulation was successful (Mattila and Cranage, 2005): participants thought that they had more freedom over the recovery options when they were given two options rather than one ($M_{options} = 3.66$; $SD_{options} = 1.63$; $M_{miles} = 1.79$; $SD_{miles} = 1.16$; $M_{voucher} = 2.05$; $SD_{voucher} = 1.17$; $F(1,197) = 37.99$, $p < .005$). There was no significant difference in participants' preference for a voucher versus miles ($M_{miles} = 2.58$; $SD_{miles} = 1.57$; $M_{voucher} = 2.74$; $SD_{voucher} = 1.31$; $F(1,131) = .63$, $p > .10$), and we merged conditions with no options (miles and voucher) as failed recovery with no co-creation in subsequent analyses. Scenarios were experimentally ($M = 6.03$ and above 4.0, $t(259) = 31.59$, $p < .001$) and mundanely ($M = 6.10$ and above 4.0; $t(259) = 34.79$, $p < .001$) realistic.

Similar to Study 3a, we measured counterfactual thinking using both item-response and open-ended measures (Tables 5 and 6). The intercoder reliability for coding open-ended responses was high ($r = .92$), and inconsistencies were resolved through discussion. Other

measures were similar to previous studies. CFA (AMOS 25) indicates a good-fitting

measurement model (χ^2 = 63.56; df = 55; CFI = .99; TLI = .98; RMSEA < .06). All scales

demonstrate good reliability, convergent and discriminant validity (see Table 6); common

method biases do not generate a problem for the study.

 We ran regression analyses with a bootstrapping procedure (PROCESS, Model 6, Hayes,

2013) for both the item-response and open-ended measures of counterfactual thinking. Similar to

study 3a, we created two dummy variables for our manipulations: failed recovery with and

without co-creation versus failed delivery (dummy 1) and failed recovery without co-creation

versus failed recovery with co-creation and failed delivery (dummy 2). Consistent with our

prediction in H1, we first assessed the effect of failed recovery with and without co-creation

versus failed delivery in our model, while covarying effects of the second dummy variable.

Consistent with H1 and H2, failed recovery increases counterfactual thinking (item-response: b =

.59, p < .001; open-ended: b < .38, p < .05) and counterfactual thinking increases negative

eWOM (item-response: b = .24, p < .001; open-ended: b = .27, p < .001). We also support H3:

the indirect effect of failed recovery on negative eWOM via counterfactual thinking alone is

significant (item-response: b = .14 [95% CI: .01, .31]; open-ended: b = .10 [95% CI: .02, .23]),

the indirect effect via counterfactual thinking and anger is also significant (item-response: b =

.06 [95% CI: .01, .14]; open-ended: b = .03 [95% CI: .01, .07]), whereas the indirect effect via

anger alone is not significant (item-response: b = .05 [95% CI: -.06, .18]; open-ended: b = .12

[95% CI: -.02, .28]). The direct effect of failed recovery on negative eWOM after including

mediators becomes non-significant (Table 10a). The effect of failed recovery without co-creation

versus the other two condition on counterfactual thinking is only significant when counterfactual

thinking is measured using open-ended question (item-response: b = .03, p > .10; open-ended: b

= .33, $p < .05$). We ran similar analyses where we assessed the effect of failed recovery without

co-creation versus the other two conditions and covaried effects of failed recovery without and

without co-creation versus failed delivery. The pattern of results remained similar to that

reported earlier for the open-ended measure but the effect of failed recovery without co-creation

versus failed recovery with co-creation and failed delivery on counterfactual thinking was not

significant on the item-response measure, whereas the co-variate effect of two failed recovery

conditions versus failed delivery remained significant (Table 10b). Hence, although failed

recovery with and without co-creation has a stronger effect on counterfactual thinking than failed

delivery, the distinction in effects of failed recovery with co-creation versus without are only

evident in relation to the open-ended measure.

---------------- Insert Table 10a and 10b about here ----------------

We further ran ANCOVA analyses to examine whether compensation options (i.e., co-

creation) vs. compensation with no option (i.e., no co-creation) offered after a failed recovery

reduces counterfactual thinking. ANCOVA results were not significant for item-response ($F(2,$

$255) = 6.04$, $p < .01$) but significant for open-ended ($F(2, 255) = 13.21$, $p < .001$) measures of

counterfactual thinking. In relation to the item-response measure, there was no significant

difference between compensation with options (M = 4.20) and compensation without options (M

= 4.22, $t(131) = .94$, $p > .10$) but counterfactual thinking remained higher in contrast to failed

delivery (M = 3.42, $t(132) = 2.80$, $p < .01$). In relation to the open-ended measure, counterfactual

thinking was lower when customers received compensation with options ($M = 1.36$, $SD=.71$)

than when they received compensation without options ($M = 1.70$; $SD= 1.02$; $t(198) = 2.44$, $p <$

.05) but it remained higher in contrast to failed delivery ($M = .87$; $SD= .85$, $t(125) = 3.53$, $p <$ .001), supporting H4b.

Consistent with our prior studies, we confirm the importance of counterfactual thinking in the effects of failed recovery on anger and negative eWOM. We only find support for the effectiveness of reactive recovery co-creation (vs. recovery without co-creation) when counterfactual thinking is measured with an open-ended measure.

Discussion

Service failures are a growing managerial concern as more and more customers are sharing their negative experiences online and potentially damaging firms' reputations (Berger and Milkman, 2012; Herhausen *et al.*, 2019). Service failures are especially problematic when a failed delivery is followed by a failed recovery, and prior service research has focused on anger and revenge as outcomes of failed recovery (Joireman *et al.* 2013). Our research brings attention to customers' counterfactual thinking as an underlying cognitive process that explains the damaging effects of failed recovery and drives both subsequent customer anger and negative eWOM. We further identify recovery co-creation as an effective strategy to minimize counterfactual thinking. By engaging a multi-method approach, we demonstrate that customer counterfactual thinking can be manifested in online reviews and thus visible to service providers. Overall, we address the call by McColl-Kennedy and Sparks (2003) to provide a more comprehensive understanding of counterfactual thinking across a variety of service failure types, its detrimental effects, and potential mitigators of these effects.

Theoretical implications

Our research suggests several theoretical implications for research on failed recovery and counterfactual thinking. First, building upon the fairness theory, we demonstrate that failed

recovery is a particularly unfair situation (even after accounting for failure severity perceptions) that increases counterfactual thinking and leads to damaging outcomes. Understanding of failed recovery is still in the developing stage and we address a recent call (Khamitov *et al*. 2020) for further investigation and a deeper understanding of underlying processes that explain the effects of failed recovery on various outcomes (Joireman *et al*. 2013; Khamitov *et al.,* 2020). Specifically, across four studies with different methods, we consistently find that counterfactual thinking is a key mediator of effects of failed recovery on negative eWOM, regardless of additional mediation explanation provided by anger as an outcome of counterfactual thinking in experiments. In contrast to prior research that emphasizes effects of failed recovery on emotions (Joireman *et al*. 2013), we demonstrate that failed recovery does not directly result in greater anger but rather impacts anger by first activating counterfactual thinking. Hence, we enrich research on failed recovery by introducing counterfactual thinking as an important immediate cognitive outcome of failed recovery that further conveys its damaging effects on both anger and negative eWOM.

Second, our research has implications for counterfactual thinking research that has mainly focused on negative emotions (e.g., anger; McColl-Kennedy and Sparks, 2003; Sparks, 2002) by identifying counterfactual thinking as a driver of negative eWOM. Negative eWOM is a growing phenomenon in the digitalizing marketplace (Berger and Milkman, 2012; Herhausen *et al.*, 2019), and we highlight importance of measuring and understanding counterfactual thinking in this digital marketplace. Additionally, building upon prior research that discussed different scales of counterfactual thinking (Nickilin *et al.*, 2011), our research has implications for counterfactual research by demonstrating consistent mediation results across even a broader range of its measures, including textual measures in online reviews, as well as item-response and

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open-ended scales in experiments. Textual measures of counterfactual thinking in existing online reviews enable us to demonstrate that counterfactual thinking has overt displays in public online data, thus advancing understanding of counterfactual expressions in marketing theory and practice.

Finally, we address a recent call for more research on understanding the effects of co-creation at different stages of service experiences (Dong and Sivakumar, 2017) and evaluate recovery co-creation as an important proactive and reactive strategy of minimizing counterfactual thinking when recovery fails (Wei *et al*., 2019). Our findings consistently demonstrate that proactive co-creation (i.e., engaging customers in recovery that is to fail) is effective in minimizing counterfactual thinking regardless of the used measures. However, reactive co-created recovery is only effective when we measured counterfactual thinking with an open-ended measure. Nicklin *et al.* (2011) propose that item-response scales capture the strength of counterfactual thoughts, whereas open-ended responses capture the frequency of counterfactual thought generation. We speculate that, after failed recovery, customers strongly believe that something could and should have been done differently regardless of compensation offerings (i.e., the strength of their counterfactual thinking does not change); yet, they are less likely to generate counterfactuals when they are offered to choose their compensation (i.e., their counterfactual frequency decreases). Overall, our findings highlight the importance of co-creation *during* and *after* a failed recovery in minimizing its damaging effects.

Managerial implications

Service providers increasingly focus on minimizing customers' adverse responses to service failures. However, due to a lack of strategic insights about "when" and "how" to make recovery

efforts, service firms may be missing opportunities to rectify failures and win back customers. Our research provides important implications for service providers by highlighting the pivotal role of counterfactual thinking and its consequences. If firms do not take any action after a service failure, customers will engage in counterfactual thinking leading to both anger and negative eWOM. This is especially problematic in cases of failed recovery. We suggest providers make efforts in preventing failed recovery to the greatest extent possible because failed recovery increases counterfactual thinking. We recommend service providers regularly monitor and assess the service delivery/recovery process by using the critical incident technique that allows managers to make appropriate adjustments in the service procedures and improve their overall quality (CIT; Gremler, 2004).

Even though counterfactual thinking is an internal cognitive process, it has vital implications because counterfactual thinking transfers the effect of failed recovery on negative eWOM. We recommend service providers keep a close eye on customers' expression of counterfactual thinking in digital outlets. If negative reviews contain many discrepancy-related words (i.e., would, could, and should) along with the use of personal pronouns (e.g., you, he, she, and they), service providers should consider interacting with customers and redress their grievances that can restore their perception of fairness and preserve the firm's reputation. Firms might consider developing text mining tools to further identify customers who are likely to express their counterfactual thinking in reviews and develop appropriate interaction strategies for these customers. To avoid the effect of counterfactual thinking on negative eWOM, firms should train employees to stay alert to customers' counterfactual thoughts in the process of their communication with customers. Onsite service quality check, follow up calls, social media

listening or face-to-face communication to recognize counterfactual thinking after failed

recovery and delivery would be advisable.

Finally, many failures are unpredictable and unavoidable. Prior research (Sparks and

Fredline, 2007) has identified failure explanation as a strategy of minimizing counterfactual

thinking. We advise providers to implement co-creation in their recovery attempts to minimize

counterfactuals both proactively and reactively. We encourage managers to empower and train

employees, so that they can proactively handle failures and know how to involve customers in

the recovery process. Recovery co-creation could be reflected in various forms, such as inviting

customers to take part in the recovery process or providing customers with options to choose

from. Service providers can communicate and educate customers about their potential role in the

recovery process to help them understand the value of recovery co-creation. Furthermore,

recovery co-creation should also be considered not only in the initial recovery but also after the

failed recovery as a reactive buffer against counterfactual thinking.

Limitations and future research directions

Our research takes a multi-method approach to investigate the important role of counterfactual

thinking in driving negative eWOM in failed recovery; yet, it has certain limitations that also

offer opportunities for future research. First, counterfactual thinking may differ based on the

nature and type of failures in delivery and recovery (e.g., process vs. outcome failures), and

future research is warranted to examine such differences. We focused on service failures that are

caused by service providers. However, in a service setting, failures could be caused by different

parties. For example, unpleasant customer-to-customer interactions may minimize customers'

positive service evaluations compared to their interactions with service employees (Bitner *et al*.,

1994). Future research could investigate how service failures impact counterfactual thinking

depending on whether failures are attributed to other customers, service providers, or uncontrollable external factors. Meanwhile, the impact of counterfactual thinking on other types of (e)WOM practice could be further explored to generalize the findings (e.g., offline WOM, cross-media eWOM).

Moreover, once customers' counterfactual thoughts are identified, service providers need to implement follow-up recovery strategies to minimize customers' counterfactual thinking. Our research focuses on co-creation and demonstrates its effectiveness in decreasing counterfactual thinking. Our research findings differed in relation to compensation options when we used an item-response (possibly reflective of strength) versus an open-ended (reflective of frequency, Nicklin *et al.*, 2011) scales. Although our initial focus was not on identifying differences in counterfactual thinking strength versus frequency, future research should consider such potential differences and their subsequent effects on outcomes. Additionally, future research should examine the effectiveness of other recovery strategies (e.g., offering empathetic responses or providing customized service) to minimize counterfactual thinking.

Our research has only started to tap into expressions of counterfactual thinking in online reviews. Future research should examine if counterfactual expressions lead to decreases in sales over time and what response strategies firms can implement to effectively respond to negative online reviews with counterfactual thoughts. Examination of counterfactual thinking in other digital outlets (e.g., social media posts, blogs, or chats) is warranted. Furthermore, counterfactual expressions in digital outlets are likely to influence prospective customers who read the reviews, and future research should provide a more nuanced assessment of processes involved in other customers' decision making upon reading reviews with counterfactual expressions.

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Figure 1. Conceptual Framework
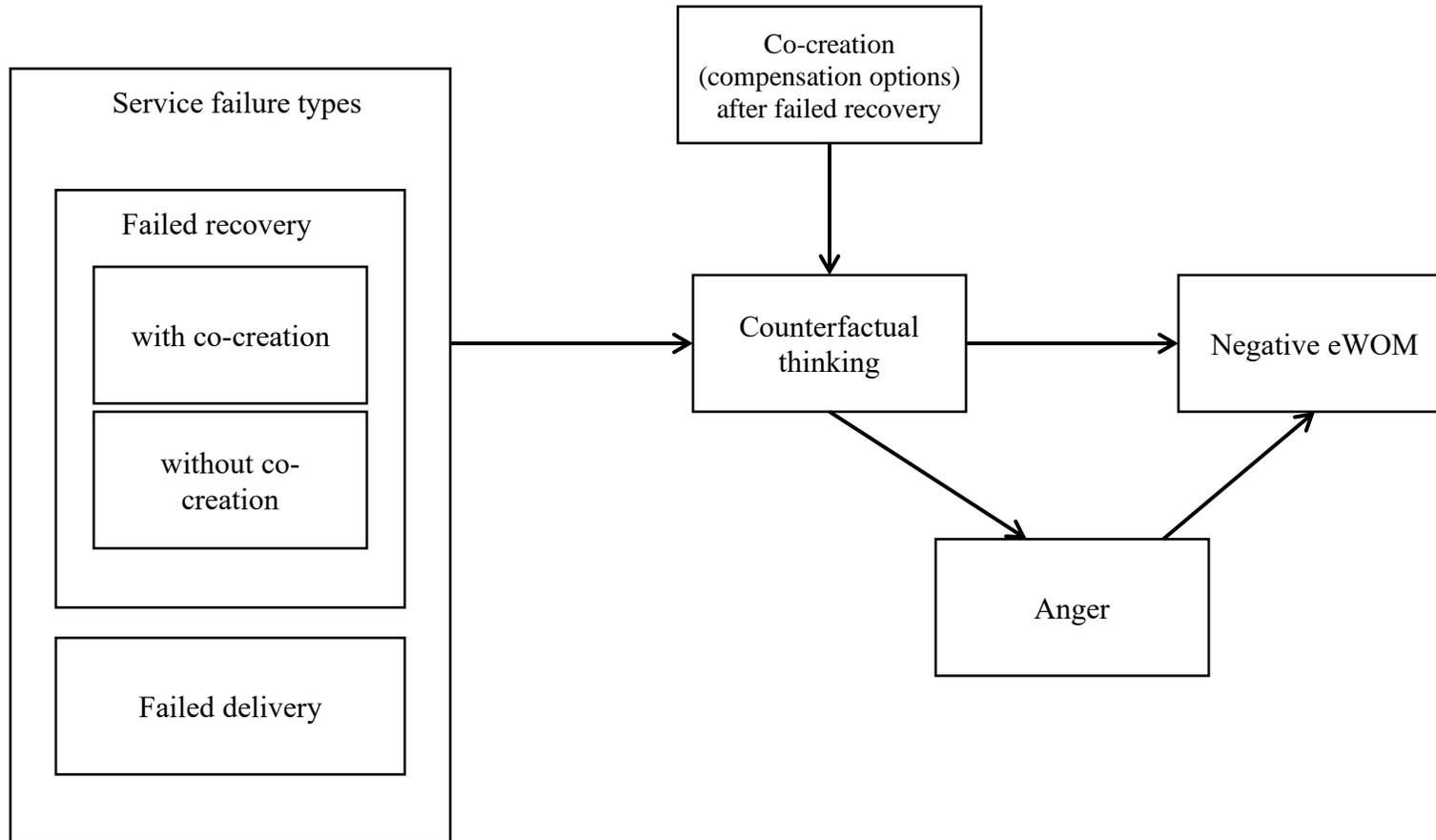
Table 1. Marketing Research on Counterfactual Thinking (in Alphabetical Order)

Author/s	Methods/ Context	Measure of Counterfactual Thinking	Antecedents of Counterfactual Thinking	Consequences of Counterfactual Thinking	Key Findings
Chan and Ngai (2010)	Interviews/ information and communication technology	N/A	Unfavorable outcome of a complaint		Failing to handle customer complaint triggers counterfactual thinking.
Krishnamurthy and Sivaraman (2002)	Experiment/ advertising	Manipulated		Information processing	Counterfactual thinking increases scrutiny of subsequently encountered information.
McColl-Kennedy and Sparks (2003)	Focus group/ service marketing	N/A	Service failure	Anger	Service failure induces counterfactual thinking leading to anger.
Nicklin *et al.* (2011)	Experiment/ task performance	Item-response and open-ended questions	Outcome severity Knowledge of risk Expertise Conduct	Fairness perception	Counterfactual thinking mediates the effect of outcome severity, knowledge of risk, expertise and conduct on fairness perceptions.
Park and Jang (2018)	Experiment/ tourism	Item-response scale	Discount rate Temporal distance	Regret	There is a U-shaped relationship between discount rate and counterfactual thinking. Temporal distance

					positively impacts counterfactual thinking that in turn increases regret.
Sparks (2002)	Focus group/ service marketing	N/A	Service failure	Anger	Service failure triggers counterfactual thinking that in turn influences customer anger.
Sparks and Fredline (2007)	Experiment/ service marketing	Item-response scale	Failure severity		In severe failures, explanation of a service failure reduces counterfactual thinking.
Wang *et al.* (2011)	Experiment/ product evaluation	Open-ended question	Negative experience		Negative purchase outcomes are more likely to trigger counterfactual thinking.
Yoon and Vargas (2010)	Experiment/ shopping	Open-ended question (thought listing)	Quantity discount violation	Dissatisfaction	Customers experience dissatisfaction when their expectation of quantity discount is violated, and this effect is mediated by counterfactual thinking.

Table 2. Study 1 Coding Examples of Failure Types from Online Reviews

Type of deviation	Coding	Example from TripAdvisor
Failed recovery (coded 1)	A service delivery failure followed by a failed recovery (with complaint)	"I went for my friend's birthday and ordered a meal that supposedly came without any meat. However, when my food arrived, I was shocked that they included bacon although I specifically asked for the vegetarian option. When I pointed it out, the waiter made it seem like it had been my mistake rather than his and refused to replace it. Then they charged me extra for the meat I didn't even want in the first place."
	A service delivery failure followed by a failed recovery (without complaint)	"We waited about 55 minutes for our mains to arrive and had to skip dessert to make it to the theatre on time. We had two waiters subsequently come up to us after about fifty minutes to tell us that our food would come in two minutes. The excuse was that it was very busy that night. That was not a very good excuse as it was a restaurant which would have had a lot of practice with pre-theatre dinners."
No recovery mentioned (coded 0)	A service delivery failure with no complaint and no recovery	"I ordered a lamb chop which was recommended by our waiter. It was ordered medium rare and came out well done. That I can understand, however it looked like a cab ran over it. The worst meal in London, by far."
	A service delivery failure with satisfactory recovery	None of the reviews coded fell into this group.

Table 3. Study 1 Correlations and Descriptive Statistics

Variable	M (SD)	1	2	3	4	5	6	7
1. Counterfactual thinking[a]	.02 (.58)	1.00						
2. Reviewer contribution[b]	29.81 (51.78)	-.10	1.00					
3. eWOM[c]	130.86 (73.48)	.24**	.04	1.00				
4. Overall rating[d]	4.34 (.23)	.06	-.07	.03	1.00			
5. Total review[e]	925.23 (612.69)	.04	.04	.11**	.08	1.00		
6. Anger[f]	.38 (.66)	.22**	-.05	.02	.04	.08	1.00	
7. Failed recovery[g]	1.22(.72)	.28**	-.11**	.37**	.05	-.02	.07	1.00

Notes: ** $p < .01$; * $p < .05$

[a] Counterfactual thinking was measured based on the computed score of the "discrep" dictionary and third-person pronouns from LIWC.
[b] Reviewer contribution is the number of reviews that a reviewer posted on TripAdvisor.
[c] eWOM is the total number of words in each 1- and 2-star review.
[d] Overall rating is the average rating of each hotel on TripAdvisor.
[e] Total review is the total number of reviews per hotel.
[f] Anger was measured by "anger" dimension in LIWC.
[g] Failed recovery was coded 0 = failed service delivery, 1 = failed recovery.

Table 4. Means and Standard Deviations by Experimental Condition Across All Studies

	Failed Delivery	Failed Recovery without Co-creation	Failed Recovery with Co-creation
	M (SD)	*M (SD)*	*M (SD)*
Study 1			
Counterfactual thinking[a] (Textual)	-.13 (.54)	.19 (.59)	
Anger	.34 (.65)	.44 (.70)	
Negative eWOM	105.48 (62.46)	159.78 (74.60)	
Study 2			
Counterfactual thinking (Scale)	4.60 (1.71)	6.08 (1.22)	
Anger	2.53 (1.72)	3.61 (2.01)	
Negative eWOM	3.18 (1.73)	4.94 (1.76)	
Study 3a			
Counterfactual thinking (Scale)	4.65 (1.62)	5.96 (1.07)	5.51 (1.19)
Counterfactual thinking (Open-ended)	.94 (.93)	1.83 (1.14)	1.51 (.76)
Anger	5.11 (1.43)	5.89 (1.09)	5.67 (1.20)
Negative eWOM	4.02 (1.62)	5.11 (1.49)	4.77 (1.57)
Study 3b			
Counterfactual thinking (Scale)	3.41 (1.61)	4.21 (1.54)	4.20 (1.51)
Counterfactual thinking (Open-ended)	.87 (.85)	1.68 (1.02)	1.40 (.72)
Anger	3.27 (1.67)	4.14 (1.63)	4.11 (1.66)
Negative eWOM	3.21 (1.73)	3.43 (1.57)	3.83 (1.65)

[a] Counterfactual thinking was captures as expressions of words in reviews and standardized.

Table 5. Study 1 Regression Results

	Counterfactual thinking		Anger		Negative eWOM	
	b	t	b	t	b	t
Direct effects[a]						
Failed recovery	.54	4.88***	.03	.27	.64	6.20***
Counterfactual thinking			.21	3.61***	.15	2.85***
Anger					-.04	.84
Indirect effects[b]						
Failed recovery on negative eWOM via counterfactual thinking					.08 [.03, .15]	
Failed recovery on negative eWOM via counterfactual thinking and anger					-.00 [-.02, .02]	
Failed recovery on negative eWOM via anger					-.01 [-.02, .01]	
Covariates						
Overall rating	.05	.82	.01	.28	.02	.03
Total review	.04	.78	.07	1.34	.11	2.15*
Reviewer contribution	-.07	1.24	-.02	.47	.09	1.69
R^2	9%		6%		18%	

Notes: *** $p < .001$; * $p < .05$

[a]Measurement details are reported in the text and Table 3 footnotes.
[b]The indirect effect is significant when confidence intervals do not include 0.

Table 6. Factor Loadings

	Study 2	Study 3a	Study 3b
	β	β	β
Counterfactual thinking			
The provider could have done something different to solve the problem better.	.95	.89	.90
The provider should have done something different to solve the problem better.	.94	.86	.93
If the provider had done a better job, it could have solved all the trouble that I experienced.	-	.78	.84
The provider should have done a better job of solving my problems.	-	.91	.94
Negative eWOM			
I would write reviews and make other online postings about my negative experience with the provider to other people.	.96	.76	.78
I would write reviews and make other online postings about my negative experience to denigrate the provider to others.	.92	.90	.89
I would write reviews and make other online postings about my negative experience to warn others not to do business with the provider.	.94	.96	.95
Anger			
I would feel angry about my experience with the provider.	.83	.89	.91
I would feel outraged with the provider.	.94	.88	.89
Blame attribution			
The provider is responsible for the service failure.	.90	.95	.86
The service failure is the provider's fault.	.96	.82	.97
Service failure severity			
The service failure would cause me a minor/major problem.	.96	.89	.87
The service failure would cause me minor/major aggravation.	.94	.88	.90

Table 7. Descriptive Statistics, Pearson Correlations, and Validity Testing in Experiments

Construct	Mean	SD	α	CR	1	2	3	4	5
Study 2									
Counterfactual thinking [a]	5.25	1.58	.98	.94	**.90 (.95)**				
Anger	3.00	1.82	.90	.90	.45***	**.84 (.91)**			
Service failure severity	4.51	1.73	.95	.96	.48***	.56***	**.91 (.95)**		
Blame attribution	5.95	1.26	.94	.95	.43***	.29***	.28***	**.89 (94)**	
Negative eWOM	3.95	1.94	.96	.96	.54***	.51***	.56***	.42***	**89 (.94)**
Study 3a									
Counterfactual thinking[a]	5.33	1.44	.92	.92	**.74 (.86)**				
Anger	5.53	1.30	.88	.88	.51***	**.79 (.89)**			
Service failure severity	5.62	1.29	.88	.88	.47***	.56***	**.79 (.89)**		
Blame attribution	6.18	1.11	.87	.88	.26***	.28***	.33***	**.80 (.89)**	
Negative eWOM	4.59	1.62	.90	.91	.51***	.51***	.52***	.32***	**.77(.88)**
Study 3b									
Counterfactual thinking[a]	4.02	1.59	.94	.95	**.82 (.91)**				
Anger	3.93	1.68	.88	.89	.57***	**.81 (.90)**			
Service failure severity	4.29	1.51	.86	.88	.48***	.52***	**.77 (.88)**		
Blame attribution	4.68	1.50	.89	.91	.42***	.36***	.31***	**.85 (.92)**	
Negative eWOM	3.48	1.64	.89	.89	.51***	.52***	.44***	.39***	**.74(86)**

Notes: The diagonal elements in bold are the average variance extracted (AVE); square roots of the AVE values are in parentheses. The lower-left triangle elements are Pearson correlations, *** $p < .001$.

[a] Counterfactual thinking is measured using an item-response scale.

Table 8. Study 2 Regression Results

	Counterfactual thinking[a]		Anger		Negative eWOM	
	b	t	b	t	b	t
Direct effects						
Failed recovery	.88	4.51***	.01	.02	.61	2.93***
Counterfactual thinking			.27	2.91***	.25	3.35***
Anger					.28	4.88***
Indirect effects						
Failed recovery on negative eWOM via counterfactual thinking					.22 [.08, .37]	
Failed recovery on negative eWOM via counterfactual thinking and anger					.07 [.02, .13]	
Failed recovery on negative eWOM via anger					.01 [-.14, .17]	
Covariates						
Service failure severity	.30	5.36***	.49	6.49***	.27	4.04***
Blame attribution	.54	7.53***	.01	1.34	.29	3.58***
R^2	47%		36%		60%	

Notes: *** $p < .001$

[a]Counterfactual thinking was measured using two-item response scale.

[b]The indirect effect is significant when confidence intervals do not include 0.

Table 9a. Study 3a Regression Results with Counterfactual Thinking Measured as Item-Response (Open-Ended) Scale Contrasting Failed Recovery (With and Without Co-Creation) vs. Failed Delivery[a]

	Counterfactual thinking		Anger		Negative eWOM	
	b	*t*	*b*	*t*	*b*	*t*
Direct effects						
Failed recovery with and without co-creation (vs. failed delivery)	.57 (.70)	2.64** (4.20***)	-.05 (-.04)	.31 (.24)	.16 (.14)	.68 (.61)
Counterfactual thinking			.27 (.21)	4.52*** (2.65**)	.25 (.20)	3.28** (2.03*)
Anger					.26 (.31)	2.97** (3.68***)
Indirect effects [b]						
Failed recovery on negative eWOM via counterfactual thinking					.14 [.02, .29] (.14 [.01, .32])	
Failed recovery on negative eWOM via anger					-.01 [-.12, .08] (-.02 [-.14, .11])	
Failed recovery on negative eWOM via counterfactual thinking and anger					.04 [.01, .10] (.05 [.01, .11])	
Covariates						
Service failure severity	.33 (-.07)	4.45*** (1.22)	.40 (.50)	5.94*** (7.53***)	.29 (.34)	3.00** (3.76**)
Blame attribution	.25 (.22)	3.37** (3.53**)	.08 (.11)	1.19 (1.37)	.24 (.22)	2.72** (2.47*)
Failed recovery without co-creation (vs. failed recovery with co-creation and failed delivery)	.53 (.34)	2.53** (2.14*)	.15 (.21)	.83 (1.17)	.24 (.28)	1.08 (1.22)
R²	.31 (.18)		.39 (.36)		.41 (.38)	

Notes: ***$p < .001$, **$p < .01$, *$p < .05$

[a]We report results for models with counterfactual thinking measured as an item-response scale without parentheses and with counterfactual thinking measured as an open-ended scale in parentheses. When significance level is stated after a parenthesis, it refers to both t-values.
[b]The indirect effect is significant when confidence intervals do not include 0.

Table 9b. Study 3a Regression Results with Counterfactual Thinking Measured as Item-Response (Open-Ended) Scale Contrasting Failed Recovery Without Co-Creation vs. Failed Recovery With Co-creation and Failed Delivery[a]

	Counterfactual thinking		Anger		Negative eWOM	
	b	*t*	*b*	*t*	*b*	*t*
Direct effects						
Failed recovery without co-creation (vs. failed recovery with co-creation and failed delivery	.53 (.34)	2.53* (2.14*)	.15 (.21)	.83 (1.16)	.24 (.28)	1.08 (1.22)
Counterfactual thinking			.27 (.21)	4.52*** (2.65**)	.25 (.20)	3.28*** (2.03*)
Anger					.26 (.31)	2.97** (3.68***)
Indirect effects [b]						
Failed recovery on negative eWOM via counterfactual thinking					.13 [.03, .28] (.07 [.00, .16])	
Failed recovery on negative eWOM via anger					.04 [-.04, .13] (.07 [-.03, .19])	
Failed recovery on negative eWOM via counterfactual thinking and anger					.03 [.00, .08] (.02 [.00, .06])	
Covariates						
Service failure severity	.33 (-.07)	4.44*** (1.22)	.39 (.50)	5.95*** (7.53**)	.29 (.34)	3.00*** (3.76**)
Blame attribution	.25 (.22)	3.37*** (3.53**)	.08 (.11)	1.19 (1.47)	.24 (.22)	2.72** (2.47*)
Failed recovery with and without co-creation (vs. failed delivery)	.57 (.70)	2.64*** (4.20***)	-.06 (-.05)	.32 (.24)	.15 (.14)	.68 (.61)
R^2	.32 (.18)		.39 (35)		.41 (.38)	

Notes: *** $p < .001$, ** $p < .01$, * $p < .05$

[a]We report results for models with counterfactual thinking measured as an item-response scale without parentheses and with counterfactual thinking measured as an open-ended scale in parentheses. When significance level is stated after a parenthesis, it refers to both t-values.
[b]The indirect effect is significant when confidence intervals do not include 0.

Table 10a. Study 3b Regression Results with Counterfactual Thinking Measured as Item-Response (Open-Ended) Scale Contrasting Failed Recovery (With and Without Co-Creation) vs. Failed Delivery[a]

	Counterfactual thinking		Anger		Negative eWOM	
	b	t	b	t	b	t
Direct effects						
Failed recovery with and without co-creation (vs. failed delivery)	.59 (.38)	2.55** (2.37*)	.21 (.37)	.95 (1.53)	-.14 (-.13)	.61 (.56)
Counterfactual thinking			.44 (.27)	7.27*** (2.82**)	.24 (.27)	3.50*** (2.87**)
Anger					.26 (.31)	3.87*** (5.22***)
Indirect effects [b]						
Failed recovery on negative eWOM via counterfactual thinking					.14 [.01, .31] (.10 [.02, .23])	
Failed recovery on negative eWOM via anger					.05 [-.06, .18] (.12 [-.02, .28])	
Failed recovery on negative eWOM via counterfactual thinking and anger					.06 [.01, .14] (.03 [.01, .07])	
Covariates						
Service failure severity	.38 (.09)	6.64*** (2.45*)	.32 (.46)	5.32*** (7.60***)	.16 (.19)	2.47* (3.04**)
Blame attribution	.27 (.08)	4.81*** (2.14*)	.09 (.19)	1.63 (3.19**)	.19 (.22)	3.16** (3.71**)
Failed recovery without co-creation (vs. Failed recovery with co-creation and failed delivery)	.03 (.33)	.15 (2.52*)	.10 (.03)	.59 (.16)	-.27 (-.36)	1.42 (1.86)
R^2	.33 (.16)		.45 (.36)		.39 (.38)	

Notes: *** $p < .001$, ** $p < .01$, * $p < .05$

[a]We report results for models with counterfactual thinking measured as an item-response scale without parentheses and with counterfactual thinking measured as an open-ended scale in parentheses. When significance level is stated after a parenthesis, it refers to both t-values.

[b]The indirect effect is significant when confidence intervals do not include 0.

Table 10b. Study 3b Regression Results with Counterfactual Thinking Measured as Item-Response (Open-Ended) Scale Contrasting Failed Recovery Without Co-Creation vs. Failed Recovery With Co-creation and Failed Delivery[a]

	Counterfactual thinking		Anger		Negative eWOM	
	b	t	b	t	b	t
Direct effects						
Failed recovery without co-creation (vs. failed recovery with co-creation and failed delivery)	.03 (.33)	.15 (2.52*)	.10 (.03)	.59 (.16)	-.27 (-.36)	1.42 (1.86)
Counterfactual thinking			.43 (.27)	7.27*** (2.82**)	.24 (.27)	3.51*** (2.87**)
Anger					.25 (.31)	3.87*** (5.22***)
Indirect effects [b]						
Failed recovery on negative eWOM via counterfactual thinking					.01 [-.09, .11] (.09 [.01, .19])	
Failed recovery on negative eWOM via anger					.03 [-.06, .13] (.01 [-.11, .14])	
Failed recovery on negative eWOM via counterfactual thinking and anger					.003 [-.04, .05] (.03 [.01, .06])	
Covariates						
Service failure severity	.38 (.09)	6.64*** (2.45*)	.31 (.46)	5.32*** (7.60***)	.16 (.19)	2.47* (3.04**)
Blame attribution	.28 (.08)	4.81*** (2.13*)	.09 (.19)	1.63 (3.19**)	.19 (.22)	3.16** (3.7**)
Failed recovery with and without co-creation (vs. failed delivery)	.59 (.38)	2.56* (2.37*)	.21 (.37)	.95 (1.53)	-.14 (-.13)	.61 (.56)
R^2	.33 (.16)		.45 (.36)		.39 (.38)	

Notes: *** $p < .001$, ** $p < .01$, * $p < .05$

[a]We report results for models with counterfactual thinking measured as an item-response scale without parentheses and with counterfactual thinking measured as an open-ended scale in parentheses. When significance level is stated after a parenthesis, it refers to both t-values.

[b]The indirect effect is significant when confidence intervals do not include 0.

Appendix A: Study 2 Scenario

Imagine that you and your friend bought tickets for a concert of your favorite singer at the local arena. After some shopping in the afternoon, you both have a few hours before the concert starts. You and your friend decide to have a quick dinner at Siglo - a dining restaurant serving Italian cuisine - before heading to the concert because you feel a bit hungry and the concert is expected to last for a few hours.

Prior to entering the restaurant, you tell the waiter that you only have about an hour for dinner as you are going to a concert and ask whether it is OK for you to finish your dinner within an hour. The waiter says to you that it would be absolutely fine before directing you to the table. After ordering, the waiter said that your food would be served **in 20 minutes**.

Thirty minutes later, you are still waiting for food. You then call the waiter to ask about your order.

Failed service delivery

The waiter tells you that he will check the dishes for you. **Your food is then served immediately**. You and your friend eat the food quickly, pay the bill, and prepare to leave, as you do not want to miss the beginning of the concert.

Failed service delivery and failed recovery

The waiter tells you that he will check the dishes for you. However, you **have to wait for another 15 minutes** for your food to be served. Due to the delay, you and your friend have to eat very quickly, pay the bill, and prepare to leave, as you do not want to miss the beginning of the concert.

Appendix B: Study 3a Scenario

RoyalView is a 3-star hotel that prides itself on being a provider of high-quality service. The hotel won the "Certificate of Excellence" award for the years 2016 and 2017.

You booked a king room at RoyalView for five nights at £100 per night for your holiday trip. After a tiring flight, you arrive at RoyalView and go directly to the reception to check in. However, after looking up your reservation, the receptionist tells you that she cannot find your reservation. Unfortunately, there are no available king rooms at this hotel any longer.

Failed service delivery

The receptionist asks you to wait in the lounge while she searches for alternative options for you. After 20 minutes of waiting, the receptionist gets back to you saying that all the rooms at this hotel are fully booked. Therefore, she finds you a similar room at a similar quality hotel next door and transfers your deposit to that hotel.

Failed recovery with co-creation

The receptionist invites you to search for alternative options. The receptionist thinks of many alternatives for you and both of you look at these alternatives together. After 20 minutes of both you and the receptionist searching for all possible options, there is still no solution because all the rooms at this hotel are fully booked. The receptionist cannot do anything now.

You then have to search for another hotel in which to stay and find a similar room, which is about 40 minutes away.

Failed recovery with no co-creation

The receptionist asks you to wait in the lounge while she searches for alternative options for you. After 20 minutes of waiting, the receptionist gets back to you saying that all the rooms at this hotel are fully booked. There is no solution for you and the receptionist cannot do anything now. You then have to search for another hotel in which to stay and find a similar room, which is about 40 minutes away.

Appendix C: Study 3b Scenario

You are ready to go home after a small holiday trip away. The weather is great and the airport does not report any delays. The flight journey is about 1.5 hours to home. However, when you arrive at the airport, you are told that the flight is canceled due to technical issues. The airline agent tells you that you need to wait for another 2 hours to get onto the rescheduled flight.

Failed service delivery

After receiving this information, you ask the airline agent to book you on an earlier flight. She then asks you to wait in the lounge while she searches for more information. You have to wait for 20 minutes before the agent was able to rebook and transfer your ticket to a different airline of the same quality.

Failed recovery

After receiving this information, you ask the airline agent to book you on an earlier flight. She then asks you to wait in the lounge while she searches for more information. You have to wait for 20 minutes before the agent gets back to you to say that there is no earlier flight available and she cannot do anything now.

After 2 hours of waiting, you can finally check in to get onto the airplane to fly home.

a. *Compensation with options (co-creation)*

When you check in, the airline agent apologizes for the inconvenience and offers you a choice between a voucher with £30 discount off a ticket that you can use for your next flight or a compensation of 2,000 miles added to your account that is worth about £30. You can choose the compensation that you prefer.

b. Only voucher compensation (no co-creation)

When you check in, the airline agent apologizes for the inconvenience and offers you a voucher with £30 discount off a ticket that you can use for your next flight.

c. Only miles compensation (no co-creation)

When you check in, the airline agent apologizes for the inconvenience and offers you a compensation of 2,000 miles added to your account that is worth about £30.