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**Kharouf, H., Lund, D. J., Krallman, A. & Pullig, C.**

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## **A signaling theory approach to relationship recovery**

Dr. Husni Kharouf  
Associate Professor of Marketing  
School of Marketing and Management, Faculty of Business and Law, Coventry University  
Priory Street, CV1 5FB, Coventry, United Kingdom  
[Phone: 44\(0\)24.7765.7688](tel:44(0)24.7765.7688)  
Email: [h.kharouf@coventry.ac.uk](mailto:h.kharouf@coventry.ac.uk)

Dr. Donald J. Lund  
Rick & Holly Wolfert Professorship and Associate Professor of Marketing  
E.J. Ourso College of Business  
Louisiana State University  
2113 Business Education Complex, Baton Rouge, LA 70803  
[Phone: 225-578-8786](tel:225-578-8786)  
Email: [dlund@lsu.edu](mailto:dlund@lsu.edu)

Dr. Alexandra Krallman  
Assistant Professor of Marketing  
Collat School of Business  
University of Alabama at Birmingham  
710 13th Street S, Birmingham, AL 35233  
[Phone: 859.486.0580](tel:859.486.0580)  
Email: [akrallman@uab.edu](mailto:akrallman@uab.edu)

Prof. Chris Pullig  
Hankamer School of Business - Baylor University  
One Bear Place #98007  
Waco, Texas 76798  
[Phone: 254.710.4769](tel:254.710.4769)  
Email: [Chris.Pullig@baylor.edu](mailto:Chris.Pullig@baylor.edu)

## A signaling theory approach to relationship recovery

### Abstract

**Purpose:** Drawing on signaling theory, the primary purpose of this research is to investigate the effects of the strength and framing of firm signals sent to repair relationships following relationship violations.

**Design/methodology/approach:** Three 2x2 scenario-based experiments (total  $n = 527$ ) manipulate: signal strength  $\times$  violation type (study 1); signal frame  $\times$  violation type (study 2); and signal strength  $\times$  brand familiarity (study 3) to examine their dynamic impacts on relationship recovery efforts.

**Findings:** Stronger signals are more effective at relationship repair and are especially important following integrity (vs. competence) violations. Signals framed as customer gains (vs. firm costs) lead to more favorable relationship outcomes. Finally, brands that are less (vs. more) familiar see greater benefits from strong signals.

**Research limitations/implications:** The three experiments were scenario-based, which may not replicate real-life behaviour or capture participants' actual emotions following a violation, thus future research should extend into real-world recovery efforts.

**Practical implications:** Managers should send strong signals (communicating the level of resources invested in the recovery efforts) framed as benefits to the customer, rather than costs to the firm. Strong signals are especially important when brand familiarity is low or an integrity violation has occurred.

**Originality/value:** This is the first research to directly apply signalling theory to the relationship recovery process and contributes to theory by examining (a) the role of signal strength; (b) framing of the signal as a customer gain vs. firm cost; (c) and the interplay of signal strength and brand familiarity on the relationship recovery effort.

**Keywords:** Signaling theory, trust, willingness to reconcile, brand familiarity, relationship repair, signal strength, signal frame, relationship violation.

## **1.0 Introduction**

The importance of building and maintaining customer relationships has received much attention in academic (Elbedweihy *et al.*, 2016; Itani *et al.*, 2019; Palmatier *et al.*, 2006) as well as managerial literature (Kappel, 2017; Kulpa, 2017) over the last several decades. In the management literature, establishing and retaining long-term relationships with customers has proven to be a rewarding strategy for firms (Chi and Chen, 2019; Hennig-Thurau *et al.*, 2002). As is the case with any relationship, problems do occur. Customers may perceive a relationship violation due to many issues, including service failures, faulty products, breaches of confidentiality, customer deception, or when the firm intentionally or unintentionally breaks the law. Research has shown that relationship violations decrease customer trust and loyalty (Sajtos *et al.*, 2010), and failure to adequately recover following a relationship violation can also lead to customer rage (Surachartkumtonkun *et al.*, 2015), which may result in retaliation towards the firm (Loureiro *et al.*, 2018).

For example, in 2019 Marriott was sued by numerous stakeholders (Bronstad, 2019) and fined \$124 million by the U.K. Information Commissioner's Office (Stupp, 2019) for a data breach it discovered in November of 2018 that compromised over 300 million customers' personal information including credit card numbers and passport numbers. In January 2020, children's clothing retailer Hanna Andersson disclosed a similar data breach (Lancaster, 2020), compromising their customers' personal and credit card information. These types of violations occur somewhat frequently in today's society and could include numerous examples including

the Volkswagen emissions scandal of 2015 or the Virgin Media data breach of their marketing database in 2020.

Following relationship violations, firms often try to implement strategic responses to regain customers' trust (de Ruyter and Wetzels, 2000; Kim *et al.*, 2004). For instance, in the example above Hanna Andersson sent a letter to customers explaining that they were taking steps to strengthen the security of their online ordering system and offered any potentially affected customers a free membership to an online identification monitoring service. These types of responses typically incorporate some form of reassurance regarding the recovery process, and communicate the firm's desire to prevent similar violations from occurring in the future (Dirks *et al.*, 2009). However, a review of the literature reveals a lack of guidance regarding what should go into these communications intended to repair relationships with affected customers (Abney *et al.*, 2017). For example, what type of information is most effective at rebuilding trust? Should the firm communicate how much the problem cost the company, or how much they are investing to repair the situation? Should these messages focus more on the impacts to individual customers, or to the firm as a whole? These are the questions that drive this research. We draw on signaling theory to develop and test hypotheses regarding the crafting of these firm-to-customer communications.

Signaling theory is concerned with reducing and explaining information asymmetries between a signaler (firm) and the signal receiver, or customers in the present context (Bergh *et al.*, 2014). The theory considers the effectiveness of five distinct components of the signal in reducing information asymmetries. Those five components include the signal's observability, cost, credibility, frequency and consistency (Connelly *et al.*, 2011). Despite its relevance to understanding interactions between customers and firms, the signaling theory literature is devoid

of applications in the relationship recovery context. In practice however, customers often use such signals to judge the appropriateness of the firm's response, and to decide whether they wish to remain a customer moving forward.

Using the foundations of signaling theory (Connelly *et al.*, 2011; Spence, 1973, 2002), a series of three experiments were conducted to investigate how firms should signal their response to customers following a relationship violation. Study 1 examines the direct and interactive effects of signal strength and failure type on common relationship outcomes (trust, satisfaction with the response, and willingness to reconcile). Study 2 investigates how the framing of the signal (as a customer gain, or a firm cost) impacts customer responses, and study 3 examines the importance of signal strength for brands that are more or less familiar to their customers. In so doing, this research contributes to theory in a number of ways. First, it contributes to the relationship failure and recovery literature by applying signaling theory to examine how signal strength and signal frame impact the relationship recovery process. Second, the inclusion of signal frame extends the original five components of signaling theory and is shown to be an important consideration in the context of signals following a relationship failure. Finally, by studying the interplay of signal strength and brand familiarity, we further test our theory using one contextual factor (brand familiarity) external to the relationship recovery process. This research contributes to practice by providing guidance to managers regarding the informational content and positioning of messages they design for their customers following relationship violations.

In the sections that follow, we first discuss signaling theory and review its applications in the academic literature and the appropriateness of this theory for the current context. We next provide a brief review of the published research in a variety of relationship failure contexts and

examine a subset of that research through a signaling theory lens. We then develop hypotheses and present the results of 3 studies, ending with a discussion of the implications of this research and potential future research opportunities.

## **2.0 Signaling Theory**

Signaling theory is comprised of four primary aspects: the signaler, the signal, the receiver, and feedback (Bergh *et al.*, 2014). In a relationship violation context, the signaler represents the offending firm, which sends a signal to receivers (affected customers), who in turn provide feedback through their perceptions and resulting behaviors (defection, continuation, WOM, etc.). The signaler has inside information regarding the relationship violation, the firm's plans for resolving the issue, and whether/how they will communicate this to their customers (Connelly *et al.*, 2011; Karasek and Bryant, 2012), resulting in information asymmetry.

The signal entails the actual message put forth by the firm. Signals are intentional (or unintentional) messages that receiving parties observe and decode in efforts to reduce this information asymmetry (Connelly *et al.*, 2011). Bergh and Gibbons (2011) argue that in order for a signal to be effective, it must meet two conditions. The first is the signal needs to be sufficiently costly to differentiate signalers from one another, and secondly the signal must be credible, in other words, receivers (customers) must perceive that there is a positive correlation between the signal and the signaler's actual capabilities (Stigler, 1961; Stiglitz, 1985).

In reviewing the application of signaling theory in the business literature, the theory has been most broadly applied in the management field. However, the foundations of the theory have strong relevance to marketing communications with customers (Bergh and Gibbons, 2011). Many researchers have used the term 'signaling' either without directly indicating the application of signaling theory (Erdem *et al.*, 2008), or indirectly applying portions of the theory (Erdem and

Swait, 1998; Rao *et al.*, 1999). To help clarify what a signal is and its potential effectiveness, Connelly *et al.* (2011) identify five signal components including: signal observability; cost; credibility; frequency; and consistency. Of these components, three have clear interpretations: observability refers to the ability of intended receivers to be exposed to the signal; frequency captures how often the receiver sees the signal; and consistency deals with the perceived similarity across multiple signals sent out by the same signaler.

Credibility, as previously mentioned, captures the perceived ability of the signaler to follow through with the signal. Economic theory argues that signals that are not in line with the signaler's capabilities undermine the intent of the signal as receivers realize the signal is not credible (Stiglitz, 1985). For example, Boulding and Kirmani (1993) find that offering a stronger warranty (signal) is less effective when firm reputation information is inconsistent with the product warranty. Researching new product launch announcements as signals, Robertson *et al.* (1995) find that competing firms are less likely to respond to these signals if they perceive the signaling firm as incapable of successfully implementing the launch. As can be seen in Table 1 (below), credibility is the most frequently researched component of signals in the marketing literature.

Signal cost has had much less exposure in the marketing literature. Signal cost refers to the resource costs of the sender in both communicating the signal (Basuroy *et al.*, 2006), as well as the perceived cost of any implementation of the content of the signal (Mavlanova *et al.*, 2012). For example, Basuroy *et al.* (2006) include total advertising expense as one signal to help predict box office revenue of movies. Berrone *et al.* (2017) focus on the costs to implement environmental initiatives (as signals) and define "strong signals" as those that are costly to imitate. We follow these authors and use the term "signal strength" to capture the costs the



signaler must commit to honor the signal (Connelly *et al.*, 2011). This research focuses on signal strength as a component of the signal as it does not include the costs of sending the signal, but instead examines the costs of implementing the message in the signal. In so doing, we are consistent with Boulding and Kirmani's (1993) findings that the strength of a warranty (e.g., how costly the warranty is to honor) is more effective when customers find the terms of the warranty to be credible. Utilizing these five-components, Table 1 provides an overview of how signaling theory has been applied in different marketing contexts.

**----Table 1 about here----**

As shown in Table 1, marketing researchers have primarily applied signaling theory to product evaluation, pricing, and financial performance studies. One of the first notable themes within the table is the reliance on product warranties as signals for quality in both product and service customer evaluations (Boulding and Kirmani, 1993; Erevelles *et al.*, 2001; Martin and Camarero, 2005). Furthermore, brand related factors such as brand logos (Han *et al.*, 2010), brand heritage (Pecot *et al.*, 2018), and brand allies (Rao *et al.*, 1999) act as additional signals for enhanced quality and price premiums. In terms of research contexts, the vast majority of signaling theory work in marketing come from secondary data sources such as firm stock performance or box office revenue data (Basuroy *et al.*, 2006; Brower *et al.*, 2017; Groening *et al.*, 2016). Finally, of the five signaling theory components described above, "credibility" has overwhelmingly received the most attention in marketing literature with "cost" being the least researched signal component.

Noticeably missing is research applying signaling theory to firm communications with customers following relationship violations. This research attempts to fill that gap by applying signaling theory to investigate how firms can effectively craft messages to strengthen their

relationships with customers following relationship violations. Furthermore, building on the under-researched “cost” component, the strength of the signal is investigated along with various types of violations.

### **3.0 Relationship Violations**

Relationship violations in a customer context have been researched extensively from a number of different perspectives including service failures, brand transgressions and product harm crises (Khamitov *et al.*, 2019). While there exists a vast literature studying these issues from various theoretical foundations, to the best of our knowledge, none of the existing research has approached the recovery effort from a signaling theory perspective. This is not to say that signaling theory does not apply to existing research, but rather that specific components of signaling theory have not been intentionally studied prior to this research. The most appropriate application of signaling theory in this context is in studying intentional firm communications following any type of relationship violation. For example, when firms issue product recalls, they generally make a public statement, or pay for advertising to communicate the product issue and explain the process for the recalled product (Dawar and Pillutla, 2000). Similarly, when firms attempt to recover from a brand transgression, there is generally an acknowledgement of the transgression that has occurred along with a message regarding the firm’s stance on the issue (Puzakova *et al.*, 2013; Puzakova *et al.*, 2016). The most commonly implemented application of signals lie in a firm’s service failure and recovery communication efforts.

While our literature search did not uncover any research that directly applied signaling theory, it did reveal a number of articles that manipulate or study how different components of post-failure communications affects customer response to the firms’ recovery efforts. In other words, there exists a large amount of extant research that can be appropriately viewed through a

signaling theory lens although not originally designed to directly test signaling theory. This is particularly true in the service failure and recovery literature. In an effort to illustrate this application of signaling theory, Table 2 presents a sample of existing research in these three areas (service failure and recovery, brand transgression, and product harm crises) that manipulates or studies recovery communications that could be interpreted as signaling components. Following recommendations outlined by Palmatier *et al.*, (2018), our literature search began with a select group of top marketing journals with high impact factors (JM, JMR, JAMS, JR, EJM, and IJRM). This examination was later expanded to include other marketing journals when it became apparent that brand transgressions and product harm crises research generally have not focused on customer response to post-transgression communications. This pattern is consistent with the findings of a recent review article investigating published research in these areas (Khamitov *et al.*, 2019).

----**Table 2 about here**----

Numerous articles in the service failure literature manipulate firm recovery communication, and in so doing, manipulate constructs that are representative of one or more signaling theory components. The vast majority of this research manipulates the cost of the signal by investigating various levels of costly recovery offers (e.g., \$150 flight vouchers in McCollough *et al.*, 2000; and three levels of compensation in Smith and Bolton, 2002 and others). The common recommendation is that more costly signals should be used in communications with customers to effectively recover from service failures. Although such findings should not be a surprise, additional research shows interesting results when contingencies are examined in conjunction with signal cost. For example, Gelbrich *et al.* (2015) find that when customers accept a flawed service experience (as opposed to rejecting it),

relatively little compensation (< 20%) is just as effective as higher levels of compensation in satisfaction with the recovery. Zhou *et al.* (2013) investigate public vs. private recovery efforts in group purchase conditions and find that social recoveries (apologies without compensation) are more effective than private economic recovery efforts.

In addition to signaling cost, the existing research also applies to several other signaling components. Observability was manipulated as recovery efforts being initiated by the customer vs. the service employee (Smith and Bolton, 2002) and whether the recovery effort was publicly observable or delivered privately (Zhou *et al.*, 2013). Credibility was manipulated in Basso and Pizzutti (2016) by the inclusion or absence of a 3<sup>rd</sup> party endorsement included in the recovery effort. Finally, those studies that manipulated the presence or absence of an apology (4 of the 7 service failure and recovery articles in the table) can be interpreted as a manipulating the signal credibility. While not directly employing signaling theory, the service failure and recovery literature is replete with examples of research that manipulate some aspect of the signal in isolation, or in conjunction with other aspects of the recovery effort. In particular, almost all of the literature in this area focuses on customer response to the recovery signal. This generalization does not apply when looking at the other two literature streams included in Table 2.

Khamitov *et al.* (2019) claims that 78.3% of brand transgression research focuses on customer reaction to the transgression itself and avoids looking at any post-transgression signals. This is consistent with our literature review identifying only three published research articles in the brand transgression area that measured customer response to a recovery signal following the brand transgression. In all three cases, the recovery effort was manipulated to include either a costly signal (product replacement or repair), signals of credibility by offering an apology (Aaker *et al.*, 2004) and transgression denial (Puzakova *et al.*, 2013; Puzakova *et al.*, 2016).

Research in the product harm crisis area was similarly devoid of empirical articles examining customer response to a post-transgression signal. The only clear exception being Dawar and Pillutla (2000) who manipulated recovery communications to include (1) an apology, product recall and restitution; (2) a public notice of the defect; or (3) no response. In so doing, their manipulations could be viewed as manipulating signal strength, observability, and credibility. The two articles by Cleeren and coauthors were included in the table as they measure customer response to some type of post-transgression communication, hence signaling theory could apply. In their earlier research, Cleeren *et al.* (2008) investigate the strategic relevance of brand advertising following a product harm crisis incident. Cleeren *et al.* (2013) examines secondary data including whether the affected brand publicly acknowledges blame for the product crisis, weekly brand advertising, price adjustments and negative publicity and the resulting customer purchase behavior towards the affected brand.

The key takeaway from these two sections of the table is that researchers have largely avoided investigations of how to craft post-transgression communications following brand transgressions and product harm crises. Muralidharan *et al.* (2019) suggest this may be due to the practical consideration that offering a strong costly and public signal following a relationship transgression may cause shareholder wrath as the company is publicly admitting to being negligent (best case) in their operations. This raises the question of where the tradeoff between shareholder opinion and customer response to the signal breaks even for the firm. Obviously, firms must be concerned with both parties as losing customers will eventually lead to poor stock performance and losing stockholder confidence can have deleterious effects on customer-facing operations.

The current research contributes to existing work in this area by investigating customer response to post-transgression signals in ways that have not been researched in the extant literature. First, we directly apply signaling theory to our study of post-transgression communications. Second, our transgressions can be classified as product harm crises (data breach affecting customer privacy and health risks from beverage ingredients) which is one subset of brand transgressions (Khamitov *et al.*, 2019). Therefore, we examine a seldom-researched context (Dawar and Pillutla, 2000 the singular exception) of customer response to post-transgression communications. Third, we build on Dawar and Pillutla (2000) by investigating the interactions of signal strength and transgression type (study 1), signal frame and transgression type (study 2), and signal strength and brand familiarity (study 3). By doing so, we investigate contingent situations, illuminating new strategic implications for managers. Finally, through this research we answer calls to further examine the most appropriate responses to repair customer relationships following product harm crises and brand transgressions (Khamitov *et al.*, 2019).

### **3.1 Violations and Signal Strength**

In order for a signal to be effective, the message needs to be sufficiently strong (that is, it must indicate a resource investment) to differentiate the firm from others (Bergh and Gibbons, 2011). One of the key ways to accomplish this is by clearly explaining the resource investment through the signal put forth by the signaler/firm. As previously discussed, the strength of the signal provides an indication of how the firm plans to invest in the relationship recovery process. For example, a *strong signal* from a firm would clearly explain the amount invested into

measures to prevent future similar violations (i.e. investing in a new quality assurance system, or direct expenditure to examine and revise existing sub-optimal manufacturing processes).

Conversely, a signal that focuses on the firm simply attempting to avoid similar failures in the future would be viewed as a *weak signal* since it does not specify any direct resource investment. In the Hanna Andersson example mentioned earlier, the signal is weak, as it does not provide details about the level of resource investment to fix the problem, nor the level of investment for the ID monitoring service. According to signaling theory, we expect that a stronger signal put forth by the firm regarding a relationship violation should lead to more positive responses from affected customers.

When a problem arises, effective resolution from the firm has been linked to numerous positive reactions from customers (Bitner *et al.*, 1990). Specifically, when customers believe a firm responds appropriately to an issue, heightened levels of trust and satisfaction, and stronger overall commitment to remain in a relationship with the firm, result (Morgan and Hunt, 1994). Trust is a crucial factor in relationship marketing and manifests “when one party has confidence in an exchange partner’s reliability and integrity” (Morgan and Hunt 1994, p. 23). When a relationship violation occurs, re-establishing trust with affected customers is critical to maintaining healthy customer-firm relationships (Lewicki and Brinsfield, 2017; Kim *et al.*, 2004). Stronger signals put forth by the firm not only better inform the customer, but also provide greater assurance that the firm is willing to invest appropriate resources to resolve the problem. Additionally, a strong signal illustrating that the firm is willing to invest in resolving the violation should lead to greater satisfaction with the response. In fact, sharing more information with customers during the recovery process is important, as information deprivation

has detrimental effects on customer satisfaction (Guo *et al.*, 2016), and results in information asymmetry.

Finally, following a relationship violation, a firm often issues an apology which not only takes responsibility for the violation but “may also convey a stated desire to reconcile and continue the relationship” (Tomlinson *et al.*, 2004, p. 169). Providing adequate explanations following a violation leads customers to show stronger desires to reconcile the relationship and minimizes negative relationship outcomes (Joireman *et al.*, 2013). A customer’s willingness to reconcile depends mainly on the customer’s assessment of the probability of the firm committing any future violations (Lewicki and Brinsfield, 2017; Tomlinson and Mayer, 2009). Consequently, a weak signal, such as an apology by itself, will likely not be sufficient and should be accompanied by some assurance for customers that the same violation will not be repeated. Strong signals indicate the firm’s dedication to maintaining the relationship, which should be reciprocated by the customer through a greater willingness to reconcile with the firm (Wang and Huff, 2007). Thus, we hypothesize:

*H<sub>1</sub>*: Stronger (vs. weaker) signals will have a greater positive impact on a) trust, b) satisfaction with the response, and c) willingness to reconcile.

In general, relationship violations exist when the customer perceives a firm’s action to be unacceptable, unethical, illegal, or simply falling below their expectations (Janowicz-Panjaitan and Krishnan, 2009). However, not all violations are the same; specifically, the relationship violation literature identifies two primary types of failures: competence-based and integrity-based violations (Basso and Pizzutti, 2015; Gillespie *et al.*, 2014; Kim *et al.*, 2006).

Competence-based relationship violations result when the firm unknowingly causes the failure, or when the customer perceives the failure to be unintentional. For instance, a competence-based violation may include an accidental failure in the production process, which



causes a faulty product to be sold to customers. Conversely, integrity-based violations exist when the firm intentionally deceives customers and exhibits dishonest behavior, or when the customer believes the firm intentionally behaved in ways that failed to meet their expectations (Kim *et al.*, 2004; Tomlinson and Mayer, 2009). Individuals attribute different weights to competency versus integrity violations. Positive information about competence is weighed more heavily than negative information about competence, whereas individuals weigh negative integrity information more heavily than positive information regarding integrity (Martijn *et al.*, 1992).

The type of violation that occurs can impact the type of signal that will be most effective in generating greater positive relationship outcomes. In competency-based failures, greater positive outcomes result when the firm communicates an apology for the violation (Kim *et al.*, 2004). This apology is a statement made by the firm, accepting accountability for the violation and regret that it occurred (Kim *et al.*, 2009; Dirks *et al.*, 2009). However as previously discussed, solely offering an apology of this type but not giving more details on how the violation will be corrected, or what types of resources will be invested in correcting the violation, would be classified as a weak signal. Although a weak signal may be sufficient following a competency-based violation, because integrity-based violations are weighed more heavily by customers, we expect that a stronger signal will be required. In fact, for major integrity based violations, a multi-step recovery strategy that goes beyond an apology to also include penance and systemic reform is recommended (Gillespie *et al.*, 2014) Therefore, when considering both signal strength and violation type, we hypothesize:

*H<sub>2</sub>*: A stronger signal will have a greater effect in restoring a) trust, b) satisfaction with the response, and c) willingness to reconcile following integrity violations, compared to competence violations.

Figure 1 provides a conceptual model of the research constructs and key relationships investigated in this research. To test H<sub>1</sub> and H<sub>2</sub>, a scenario-based experiment was designed as described below.

----**Figure 1 about here**----

## **4.0 Study 1**

### ***4.1 Sample and procedure***

Study 1 employed a 2 (signal: weak versus strong) x 2 (type of violation: competence versus integrity) between subjects scenario-based experimental design. Participants were recruited from an online panel of customers in the UK. In total 175 participants were recruited to complete the online questionnaire. The sample was 49% male, 51% female and 55.7% of respondents were in the 25-54 age-range.

### ***4.2 Manipulations***

The research context for study 1 was a European mobile phone provider. Participants were asked to read a short scenario describing the fictional mobile phone provider (RINNA) and a massive data breach the company suffered, which exposed customer personal and financial information. The relationship violation was the same in both the competence and integrity scenarios, the type of violation was manipulated through the explanation of events leading to the data breach. In the integrity manipulation, participants were exposed to an explanation that “RINNA had deliberately neglected cyber security” measures in order to obtain new customers quickly. In the competence manipulation, the data breach occurred “despite their (RINNA’s) security measures.” The scenarios also included RINNA’s response to the data breaches. In both the strong and weak signal manipulations, RINNA issued a public apology and promised to fix

the problem as a matter of urgency. For the signal manipulation, we added that RINNA “announced investment of one million pounds in a new data encryption system”.

#### **4.2 Measures**

After reading the scenario, participants were asked a series of questions about their willingness to reconcile with the firm, how satisfied they were with the firm’s response and the effect of the firm’s response on their trust. This was followed by single item manipulation check measures.

All multi-item measures were adapted from established literature. A three-item trust measure was adapted from Sirdeshmukh *et al.* (2002):  $\alpha = 0.87$ . Satisfaction was captured with four items adapted from Morgeson *et al.* (2015):  $\alpha = 0.88$ . Willingness to reconcile was captured with four items adapted from Wang and Huff (2007):  $\alpha = 0.69$ . Single item measures were developed and used as manipulation checks for signal strength (1=weak, 7=strong) and violation type (1=integrity, 7=competence). All study measures are included in Appendix A, and the manipulations are included in Appendix B. We also measured age and gender to be included as covariates in our analyses.

#### **4.3 Results**

Separate 2 (signal strength)  $\times$  2 (violation type) Analyses of Variance (ANOVAs) were performed to assess the validity of the signal strength and violation type manipulations. In support of our manipulation, those in the strong signal condition reported higher average responses ( $M = 5.45$ ; 1=weak, 7=strong) compared to those in the weak signal condition ( $M = 2.01$ ;  $F_{1,140} = 377.42$ ,  $p < 0.01$ ). Also, we find support for our violation type manipulation as those in the integrity violation condition score higher ( $M = 5.60$ ; 1=integrity, 7=competence) than those in the competence violation condition ( $M = 1.67$ ;  $F_{1,140} = 492.65$ ,  $p < 0.01$ ).

Three separate ANOVAs were performed (with trust, satisfaction with the response, and willingness to reconcile as dependent variables) to test our hypotheses. Hypothesis 1 argued that stronger signals would have a positive impact on (a) trust, (b) satisfaction with the response and (c) willingness to reconcile. In support of this hypothesis, we find that signal strength has a significant impact on (a) trust ( $F_{1,140} = 27.69, p < 0.01; M_{stronger} = 4.72; \text{ and } M_{weaker} = 3.49$ ); (b) satisfaction with the response ( $F_{1,140} = 33.24, p < 0.01; M_{stronger} = 4.27; \text{ and } M_{weaker} = 3.07$ ); and (c) willingness to reconcile ( $F_{1,140} = 13.16, p < 0.01; M_{stronger} = 4.58; \text{ and } M_{weaker} = 3.88$ ).

Hypothesis 2 argued that a stronger signal would reduce the negative impact of integrity violations, more than competence violations, for (a) trust, (b) satisfaction with the response and (c) willingness to reconcile. This hypothesis implies an interaction between signal strength and violation type. In partial support of H2, we find a marginally significant interaction for trust ( $F_{1,140} = 3.63, p = 0.059$ ) and a significant interaction for willingness to reconcile ( $F_{1,140} = 5.10, p < 0.05$ ). However, the interaction between violation type and signal strength has a nonsignificant effect on satisfaction with the response ( $F_{1,140} = 0.01, p > 0.10$ ). To test the direction of the significant interactions, we perform simple effects analysis within each violation type. The marginal means and plots of the effects are shown in Figure 2. In support of H2, following the integrity violation condition, a stronger signal results in higher trust ( $M_{strong} = 4.81 \text{ and } M_{weak} = 3.13; p < 0.01$ ). This pattern is also evident following a competence violation ( $M_{strong} = 4.63 \text{ and } M_{weak} = 3.85; p < 0.05$ ), however the difference is greater following the integrity violation. Following the integrity violation, a stronger signal results in greater willingness to reconcile ( $M_{strong} = 4.39 \text{ and } M_{weak} = 3.26; p < 0.01$ ). However, in the competence violation condition, a stronger signal does not have a significant effect on willingness to reconcile ( $M_{strong} = 4.77 \text{ and } M_{weak} = 4.51; p > 0.10$ ). Detailed results are summarized in Table 3.

----Figure 2 about here----

----Table 3 about here----

The results from the first study demonstrate that a stronger signal is more effective in restoring trust, satisfaction, and influencing customers' willingness to reconcile with the firm regardless of the nature of the violation. However, this effect is more pronounced following integrity violations. Based on our results, firms would achieve much better results when addressing integrity violations with a strong signal, clearly stating the resource investment the firm is willing to make to rectify the situation. This finding helps answer calls for further examination appropriate responses following different types of relationship violations (Ferrin *et al.*, 2007; Kim *et al.*, 2004).

## 5.0 Signal Frame

While signaling theory literature argues a cost must be associated with the signal in order to be strong (Connelly *et al.*, 2011), the theory currently does not provide an ample explanation on the nature of this cost or how that signal should be framed. For example, a strong signal could include the resource cost to the firm of fixing the problem (as in study 1), or the cost could be framed as a direct benefit to the customer (e.g., full refund or discounted future orders).

The idea behind message framing is that firms' communications could present the resource investment in one of two ways: cost to the firm; or gain to the customer. These two framing alternatives have been shown to result in different behavioral responses (Rothman *et al.*, 2006). Gain-framed signals express the benefit to customers of adopting or following a certain behavior, while loss-framed signals express the cost to the firm. Message framing has been applied in several contexts, for example in assessing negative emotions and customers' attitude to recycling (Baek and Yoon, 2017), emotions affecting responsible drinking (Duhachek *et al.*,

2012). In psychology, Gerend and Cullen (2008) examine the effect of message framing on alcohol consumption, finding that participants reacted more positively (they consumed less alcohol) when exposed to the gain-messages. You *et al.* (2020) find that framing service recovery messages in a positive and appreciative way has a greater effect on the recovery process compared to messages framed to convey an apology.

Within the recovery process, firms often provide tangible gains to customers in an attempt to repair their relationships (Vázquez-Casielles *et al.*, 2012). Such compensation may take on many forms (i.e. discounts, extended warranties, financial payment). These are framed as benefits to the customer. Research in evolutionary psychology on “costly apologies” provides evidence that a signal framed as a benefit to the customer may be more effective (Watanabe and Ohtsubo, 2012). While this line of research does not differentiate between an integrity-based and competence-based violation, the violation tested was operationalized as integrity-based in a game-based scenario. The researchers theorize that when the response is framed as a gain to the second party, it is perceived as a signal of the violating party’s conciliatory intent or contrition. The apology and associated conciliatory intent buffers negative emotions related to the relationship violation (Watanabe and Ohtsubo, 2012). Such negative emotions are more likely in an integrity violation. Thus, we expect that a strong signal with the cost framed as a customer gain will be more effective in general and especially effective given an integrity violation.

*H<sub>3</sub>*: Signal frames stressing customer gain (compared to firm cost) will be more effective in reducing the negative impact of relationship violations for a) trust, b) satisfaction with the response, and c) willingness to reconcile.

*H<sub>4</sub>*: Signal frames stressing customer gain (compared to firm cost) will reduce the negative impact of integrity violations more than competence violations, on a) trust, b) satisfaction with the response, and c) willingness to reconcile.

## 6.0 Study 2

### ***6.1 Sample and procedure***

Study 2 employed a 2 (signal frame: firm cost versus customer gain) x 2 (type of violation: competence versus integrity), between subjects scenario-based experimental design. Participants for the second study were recruited from three local offices of a national charity based in the UK. As a result, 251 participants completed the questionnaire. The sample was 20.4% male, 79.6% female and 70.1% of respondents were in the 45-74 age-range.

### ***6.2 Manipulations***

The context and relationship violation manipulation described in study 2 mirror those used in study 1. In both signal frame scenarios, RINNA apologizes and promises to fix the problem. The signal frame was manipulated through a description of the resource investments in response to the data breach. In the customer gain manipulation, RINNA announced a substantial discount to affected customers over the next few months to make up for the data breach (customer gain). In the firm cost scenario, RINNA announced an investment of one million pounds into new security measures. All scenarios are provided in Appendix B.

### ***6.3 Measures***

The measures for the second study are the same as those for study 1. Single item measures were developed in this research and used as manipulation checks for signal frame (1=firm loss, 7=customer gain) and violation type (1=competence, 7=integrity). All measures are included in Appendix A.

### ***6.4 Results***

Similar to study 1, we constructed three indices: willingness to reconcile ( $\alpha = 0.83$ ), trust ( $\alpha = 0.84$ ) and satisfaction with the response ( $\alpha = 0.89$ ). Separate 2 (signal strength) x 2 (violation type) analyses of variance (ANOVAs) were performed to assess the validity of the

signal frame and violation type manipulations. The signal frame ANOVA shows a significant expected effect for signal frame ( $F_{1,161} = 130.10, p < 0.01; M_{customer\ gain} = 5.19, M_{firm\ loss} = 3.41$ ) only. The violation type ANOVA reveals a significant intended effect for violation type ( $F_{1,161} = 239.93, p < 0.01; M_{integrity} = 4.58, M_{competence} = 2.17$ ) only.

Three separate ANOVAs were performed (with trust, satisfaction with the response, and willingness to reconcile as dependent variables) to test our hypotheses. H<sub>3</sub> predicts a significant main effect of signal frame with the customer gain frame being more effective than the firm loss frame. We find partial support for H<sub>3</sub>. Signal frame has the expected significant main effect on trust ( $F_{1,157} = 6.50, p < 0.01; M_{customer\ gain} = 4.78, M_{firm\ loss} = 4.33$ ), and willingness to reconcile ( $F_{1,157} = 5.05, p < 0.05; M_{customer\ gain} = 4.72, M_{firm\ loss} = 4.35$ ), but not on (b) satisfaction with the response ( $F_{1,157} = 0.96, p > 0.10; M_{customer\ gain} = 4.33, M_{firm\ loss} = 4.20$ ). H<sub>4</sub> argued that a customer gain (compared to firm loss) signal would reduce the negative impact of integrity violations on trust, satisfaction with the response, and willingness to reconcile more so than following a competence violation, implying an interaction between signal frame and violation type. We find nonsignificant interactions of signal frame and violation type on trust ( $F_{1,157} = 0.23, p > 0.10$ ), satisfaction with the response ( $F_{1,157} = 0.00, p > 0.10$ ), and willingness to reconcile ( $F_{1,157} = 0.50, p > 0.10$ ) therefore, we cannot accept H<sub>4</sub>. Table 4 provides ANOVA results for study 2.

----Figure 3 about here----

----Table 4 about here----

Results from study 2 establish that firms not only need to consider the strength of the signal that they communicate, but also how those signals are framed. We find that framing the recovery effort to point out the gains to the customer, rather than the loss to the firm, results in greater trust and willingness to reconcile. This effect holds regardless of violation type. These



findings provide further guidance to managers communicating with customers following a relationship violation. We find that differentiating between types of violations and forming different types of repair strategies as suggested by Kharouf and Lund (2018) would have a stronger impact on the repair efforts if the firm sends a strong signal. Ours is the first research we are aware of that investigates the framing of signals in the context of signaling theory; we extend this theory by demonstrating that customers respond more positively to a customer gain framed signal compared with a firm cost framed signal.

Studies 1 and 2 investigate signal strength and signal framing using a scenario based on a relationship violation from a fictional brand, thus respondents had no prior knowledge or relationship experience with that brand. Because we expect that prior relationship experience may have an impact on customer perceptions (of both the relationship violation and recovery effort), study 3 was designed to examine a contextual factor (brand familiarity) outside of the relationship recovery process and identify how brand familiarity may affect signals sent following a relationship violation.

## **7.0 Brand Familiarity**

Brand familiarity is defined as the totality of customers' direct and indirect experiences with a brand (Vizcaíno and Velasco, 2019; Kent and Allen, 1994). Customers with more experiences with the brand have higher levels of brand familiarity and as a result, have more well-developed knowledge structures or brand schemas. Customers with fewer experiences have lower levels of brand familiarity based on more sparse knowledge structures (Sirianni *et al.*, 2013; Park and Lessig, 1981).

Prior studies have found that familiar brands have several advantages over unfamiliar brands, for example, customers process information about their familiar brands more quickly and

more easily (Kent and Allen, 1994). Additionally, brands that are more familiar to the customer benefit from enhanced levels of recall and more positive brand image perspectives, therefore do not require high levels of consistent messages (Campbell and Keller, 2003; Delgado-Ballester *et al.*, 2010). Specifically when facing crises, brand familiarity further aides in creating more positive customer attitudes and brand assessments (Dawar and Pillutla, 2000, Dawar and Lei, 2009) and creates a shield that protects familiar brands from negative evaluations (Vizcaíno and Velasco, 2019). Zhao *et al.* (2011) found when faced with a product harm crisis, familiar brands are more effective in overcoming such crisis than unfamiliar brands, as consumers show bias in favor of more recognizable brands (Carvalho *et al.*, 2015).

These effects are explained in part because individuals process information differently when possessing varying levels of brand familiarity. With more sparsely developed knowledge structures, individuals with less familiarity of a brand are more likely to rely on extrinsic cues such as price (Rao and Monroe, 1988). Individuals with more well-developed knowledge structures are more capable and likely to process intrinsic cues such as brand quality.

Building on prior literature on brand familiarity, we expect that customers with lower levels of brand familiarity will be more influenced by cues related to a response's signal strength (Dawar and Lei, 2009). These individuals cannot fall back on prior experience and judgments of past reputation and are therefore more likely to process all aspects of the signal, using the signal as the primary evaluation point to assess the recovery efforts of less familiar brands (Sirianni *et al.*, 2013). Customers with higher brand familiarity, however, will use prior experience and related judgments and are less likely to be influenced by the signal strength cue. Therefore, we propose the following:

*H5*: The effect of a stronger signal will be more pronounced for brands with lower levels of familiarity in a) restoring trust, b) satisfaction with the response, and c) willingness to reconcile.

## **8.0 Study 3**

### ***8.1 Sample and Procedure***

The third experiment used a 2 (signal: weak versus strong) x 2 (familiar versus non-familiar brand), between subjects design. Participants were recruited from an online panel of customers in the United States. A total of 101 respondents participated in the study, and as with studies 1 and 2, an online questionnaire was used to conduct study 3. The sample was 49.5% male, 50.5% female and 60.4% of respondents were in the 30-49 age-range.

### ***8.2 Manipulations***

In order to manipulate brand familiarity, participants were asked to select a brand from a list of 12 soft drink brands that they are most (high familiarity) or least (low familiarity) familiar with from a list of 12 brands. To ensure some lower familiarity brands were available to participants, a number of soft drink brands available only in Europe were included in the list of 12 brands. After selecting the most/least familiar brand, that brand name was included in the text of the relationship violation scenario and accompanying measures to keep participants focused on that brand. The relationship violation presented in the scenario was that the soft drink used a flavor-enhancing ingredient that has recently been linked to serious health risks. In both manipulations, the firm issues a public apology. Signal strength was manipulated by the firm's announcement that they will be immediately switching suppliers (low signal strength) or that the firm has established a process for customers to obtain necessary medical help and offering a full refund on any affected products (strong signal). The scenarios can be found in Appendix B.

### ***8.3 Measures***

Because this study investigates brand familiarity, it is possible that customer preference is higher for brands with which they are more familiar. In order to control for that possibility, a four-item measure was included that was adapted from Sirianni *et al.* (2013):  $\alpha = 0.95$ . The same measures used in studies 1 and 2 were also included in study 3. Single item measures were developed as manipulation checks for signal strength (1=weak, 7=strong) and brand familiarity (1=low, 7=high). All measures are included in Appendix A.

#### **8.4 Results**

Similar to studies 1 and 2, we constructed three indices for willingness to reconcile ( $\alpha = .84$ ), trust ( $\alpha = .83$ ), satisfaction with the response ( $\alpha = .90$ ). To control for the impact of any existing brand perceptions that participants might have, we included brand equity as a covariate in study 3 analyses. Separate 2 (signal strength)  $\times$  2 (brand familiarity) analyses of variance (ANOVAs) were performed to assess the validity of the signal strength and brand familiarity manipulations. The signal strength ANOVA shows a significant effect for signal strength ( $F_{1,101} = 5.39, p < 0.05; M_{strong} = 3.10, M_{weak} = 2.29$ ). The familiarity ANOVA reveals a significant effect for familiarity ( $F_{1,101} = 1081.15, p < 0.01; M_{high} = 4.58, M_{low} = 1.08$ ).

Three separate ANOVAs were performed (with trust, satisfaction with the response, and willingness to reconcile as dependent variables) to test our hypothesis.  $H_5$  argues that brand familiarity will attenuate the effect of stronger signals on (a) trust, (b) satisfaction with the response, and (c) willingness to reconcile. We find significant interactions of signal strength and brand familiarity on satisfaction with the response ( $F_{1,101} = 6.74, p < 0.01$ ) and willingness to reconcile ( $F_{1,101} = 3.93, p < 0.05$ ), but a non-significant interaction on trust ( $F_{1,101} = 2.86, p = 0.09$ ).

The marginal means and plots of the effects are shown in Figure 4. In support of H<sub>5</sub>, within the lower familiarity condition, a stronger signal results in higher satisfaction with the response ( $M_{strong} = 4.46$  and  $M_{weak} = 3.88$ ;  $p < 0.05$ ). However, in the higher familiarity condition, a stronger signal does not have a significant effect on satisfaction with the response ( $M_{strong} = 3.40$  and  $M_{weak} = 3.68$ ;  $p > 0.10$ ). Similar effects are found for willingness to reconcile. In the lower familiarity condition a stronger signal results in higher willingness to reconcile ( $M_{strong} = 4.59$  and  $M_{weak} = 4.13$ ;  $p < 0.05$ ). In the higher familiarity condition, a stronger signal has a significant negative effect on willingness to reconcile ( $M_{strong} = 3.31$  and  $M_{weak} = 3.96$ ;  $p < 0.05$ ). Detailed results are summarized in Table 5.

----**Figure 4 about here**----

----**Table 5 about here**----

The results of the third study demonstrate that when the brand is less well known to customers, firms need to send strong signals following a relationship violation. Study 3 establishes the impact of signal strength and brand familiarity on customers' satisfaction with the response and willingness to reconcile with the firm. In addition, our findings suggest that stronger signals from brands with lower customer familiarity result in higher satisfaction with the response and willingness to reconcile.

## **9.0 Discussion**

Despite being widely cited within related business disciplines to examine firm communication (Connelly *et al.*, 2011; Karasek and Bryant, 2012), signaling theory has not seen direct application to the marketing recovery literature. In response, this research shows that signaling theory plays an important role in explaining how a firm should communicate with its customers following a relationship violation. Appropriate signaling strategies can lead to greater

relationship outcomes for the firm, but such positive results are dependent on several factors including: the type of violation that occurs, the strength of signal communicated by the firm, the manner in which the signal is framed, and the level of customer brand familiarity. Based on the findings of this research, contributions to both marketing theory and practice are identified as well as limitations and directions for future signaling theory research in marketing.

### ***9.1 Theoretical Implications***

From a theoretical perspective, this research is one of the first applications of signaling theory in the recovery and repair process. As illustrated in the recent review by Khamitov *et al.* (2019), related works in service failure and recovery, brand transgression, and product harm crisis contexts could benefit from research integration and application of new theories. By utilizing signaling theory, this research helps bridge some of the existing gaps in these three areas by testing how variables measuring individual level customer assessments can be combined with actual firm recovery efforts to impact trust, satisfaction with the recovery, and customers' willingness to reconcile. Although not always labeled as formal signals, several papers within the service failure and recovery literature can be interpreted from a signaling theory perspective as shown in Table 2. The majority of work in service failure and recovery tests the presence or absence of a signaling component but does not indicate the actual costs or message framing that should be included in recovery communications. Thus, this research attempts to begin answering the call made for more research in this domain by Khamitov *et al.* stating "*Future research is recommended to provide specific prescriptions about the dimensions of an apology, the optimal level of compensation, and the most appropriate compensation type*" (2019, p.9).

This research provides such signaling specification details by testing exact costs included in the recovery message (i.e. signal strength) and whether the communication is conveyed as a

firm loss or customer gain (i.e. signal frame). Extending the contribution of this paper further, specific violation types and levels of brand familiarity are also tested through interactions with the signaling components. Both brand transgression and early product harm crisis research have primarily examined variables at the individual customer's level of analysis. These micro-level factors include understanding customers' relationship to the brand (Guckian *et al.*, 2018) and the various kinds of violations that occur (Lin and Sung, 2014). Importantly, the vast majority of these prior studies have not combined these individual-level factors with specific signals used in recovery communications. To the best of our knowledge, this is the first paper to examine how specific levels of signaling components can interact with different violation types and varying levels of brand familiarity to impact important relationship outcomes.

In addition to applying this theory to a marketing context, the current work further extends the original five signaling theory components by investigating a new element, the framing of the signal. Combining research from psychology and consumer behavior focused on gain versus loss-framed messaging (Watanabe and Ohtsubo, 2012) with the strategic foundations of signaling theory in management (Connelly *et al.*, 2011), this research is the first to investigate how signal framing affects the relationship recovery process. Although signal strength plays a vital role in relationship recovery, the way in which the message is framed is also shown to impact customers' trust in the firm and their willingness to reconcile, suggesting that the signal frame may be an important component to consider when applying signaling theory in marketing contexts. Specifically, the firm's message should frame the resources they are investing in the recovery as a gain to customers (e.g. offering monetary and non-monetary compensation) instead of simply a cost to the firm. This is particularly important for brands that may be less familiar to customers. Future research should consider both signal strength and frame to get a more holistic

understanding of the impact of signaling theory. The inclusion of brand related factors helps to understand situations in which signaling may be more (or less) effective.

## ***9.2 Practical Implications***

From a practitioner perspective, this research offers several actionable steps that marketing managers can take to help mitigate the negative impact of a relationship violation. Many firms today work with marketing agencies and consultants to establish a crisis management plan in the event of a major firm failure or violation. Logically, the first step in this plan is often to identify and understand the type of violation that has occurred. The two most common types of violations (competence-based and integrity-based) were investigated in this research, with integrity-based violations typically being weighed more heavily by customers. While the extant literature argues that managers should focus on the nature of the violation, this research highlights that, instead managers would see greater benefits by considering the most appropriate signal strength – and associated financial investment – and signal frame to communicate.

We recommend that within a crisis communication plan, firms should create strategies for communicating signals with their customers for any type of foreseeable violation that could occur. As signal strength and frame proved to positively impact relationship outcomes, these plans should include the amount of potential investment the firm is willing to make to resolve such an issue and outline how such cost allocations will be expressed in messaging. To best convey how these findings can be put into use by managers, a recent example from practice is discussed below.

As highlighted in the introduction, children's clothing retailer Hanna Andersson recently disclosed a data breach in a letter to their impacted customers (Lancaster, 2020). Within this



letter, the company opens by admitting that a competence-based failure occurred as an unauthorized third party potentially gained access to both personal and financial customer information. The next portion of the letter, under a heading titled “What We Are Doing” then provides an example of signal strength by stating:

*“We have taken steps to re-secure the online purchasing platform on our website and to further harden it against compromise. In addition, we have retained forensic experts to investigate the incident and are cooperating with law enforcement and the payment card brands in their investigation of and response to the incident.”*

The excerpt above attempts to inform customers that the retailer is investing resources into resolving the issue by hiring a forensic team. While this does subtly communicate a cost to the retailer, the results of this research suggest that instead the specific amount Hanna Andersson plans to invest into this issue should be clearly spelled out (i.e. We have invested \$10 million to ensure our website is more secure). Based on the results of this research, providing visibly strong signals in terms of resource investment in resolving the issue would lead to more favorable outcomes for the retailer.

Following the statement above, the letter goes on to further illustrate an example of signal framing:

*“In addition, as an added benefit to help protect your identity, we are offering MyIDCare™ identity theft protection services through ID Experts®. MyIDCare services include: 12 months of credit and CyberScan monitoring, a \$1,000,000 insurance reimbursement policy, and fully managed id theft recovery services. With this protection, MyIDCare will help you resolve issues if your identity is compromised.”*

Based on the findings of this research, Hanna Andersson effectively frames the message in terms of a customer gain by providing those potentially impacted by the breach with a year of free identity protection. The letter ends by sincerely apologizing for the failure, which is especially important for these types of competency-based failures (Kim *et al.*, 2004). Although the strength of the signal provided in the letter could be improved, the recovery response from Hanna Andersson was well executed based on signal frame given the violation type. Other brands should take note of the actions undertaken by the retailer and proactively develop similar recovery strategies for their firm.

### ***9.3 Limitations and Future Research***

As with any research, it is important to acknowledge the limitations of the studies contained herein. The three experiments utilized a scenario-based approach. Thus, it is possible that the scenarios may not fully capture participants' actual behavior and evaluations following a real-life violation. Future studies utilizing other methodologies are recommended to assess the use of signaling theory in a real relationship recovery context. Additionally, this research focused solely on the message that was being communicated and did not take into account the timing or the channel through which the message was received. As customers are now able to communicate with brands in real-time through multiple online channels, future studies should expand these results to understand how time delays from violation to response affect customer perceptions of firm signals. For instance, can a firm initially employ a weaker signal if they respond quickly? Does the strength of the signal need to increase as the amount of time since the violation increases? How does the formality of the communication channel used (i.e. a message posted on social media versus a formal press release) affect how the signal is received by customers?

Additional avenues for future research include other aspects of signaling theory not investigated in this study. We only explore two of the five signaling theory components, future research could explore, for example, the effect of signal observability or consistency on the relationship recovery process (Connelly *et al.*, 2011). Furthermore, we encourage future studies to use participants across different cultural contexts to assess if customer response to signals varies across cultures and across different types of violations. For example, strong signals may be less effective in recovering from integrity violations in collectivist cultures that place greater value on relationships. This represents a viable avenue for future research exploration.

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Figure 1. Conceptual Framework

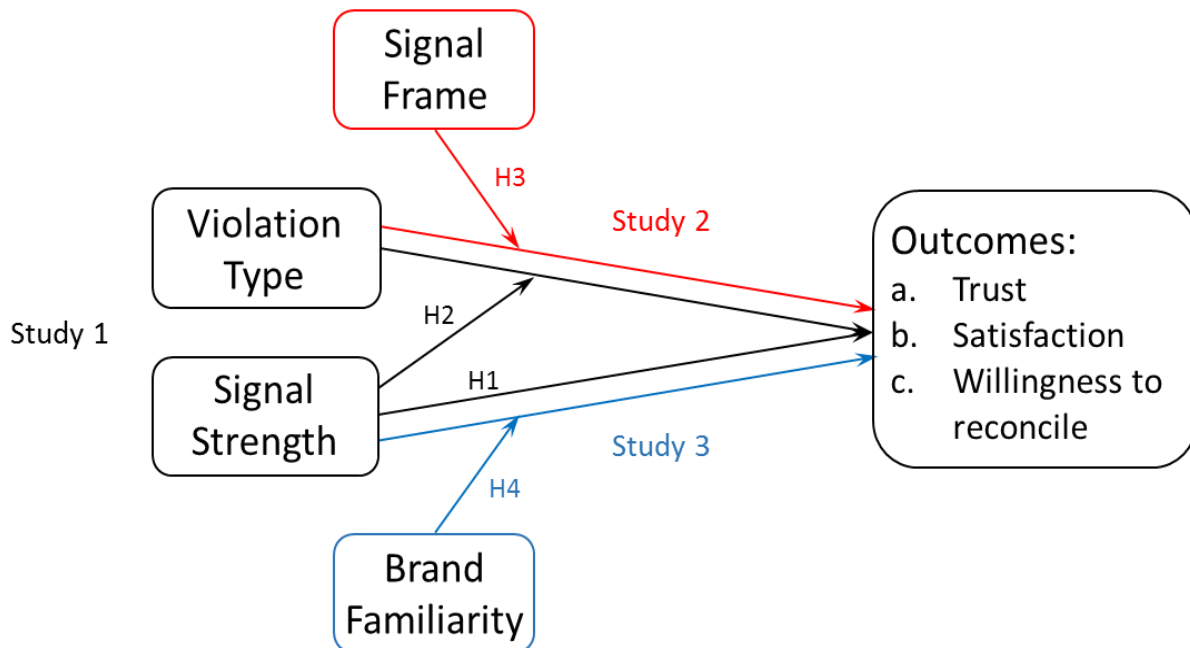




Figure 2. Study 1 Interaction Effects  
Signal Strength × Violation Type

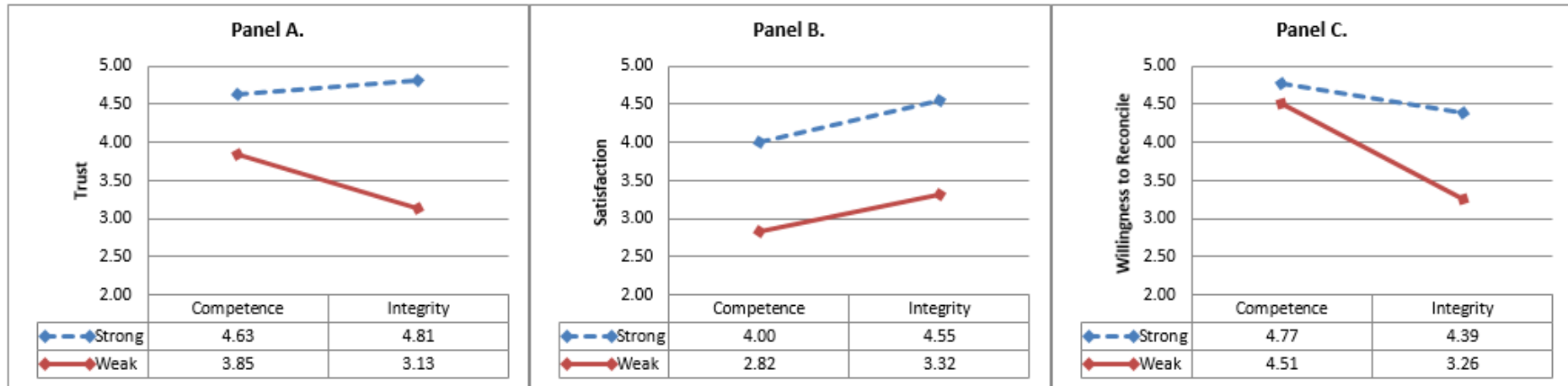


Figure 3. Study 2 Interaction Effects  
Signal Frame × Violation Type

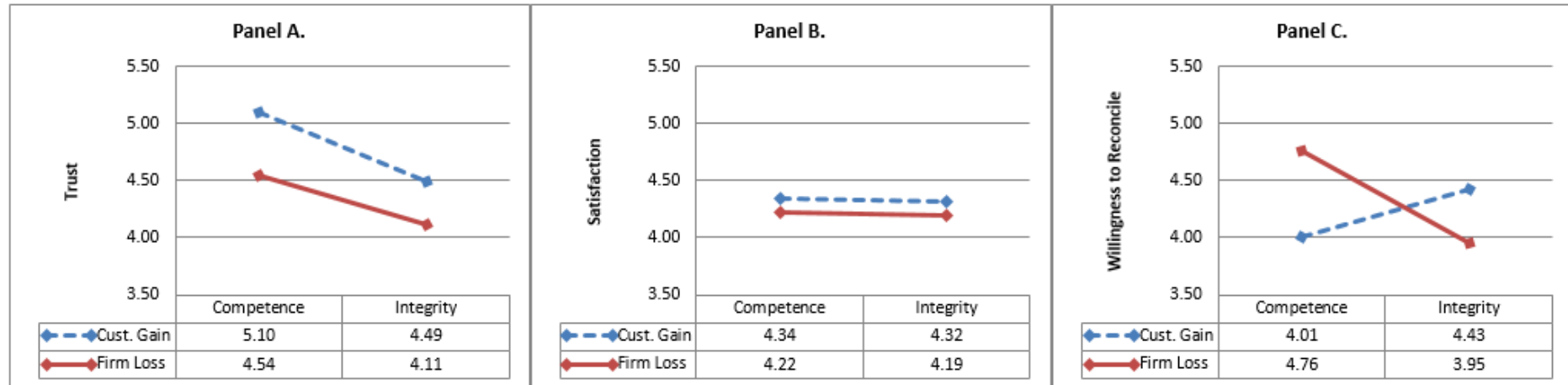


Figure 4. Study 3 Interaction Effects  
Signal Strength × Brand Familiarity

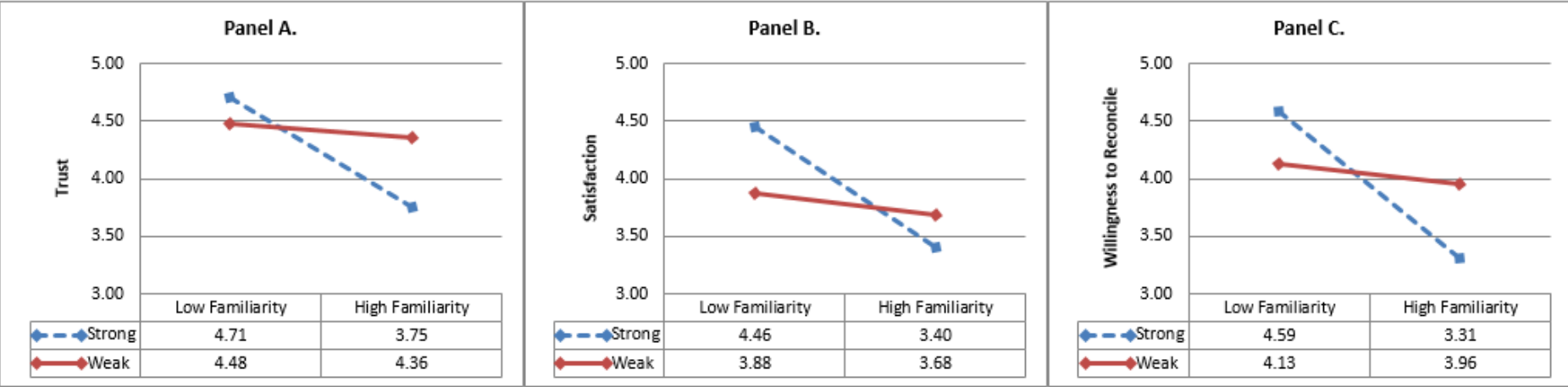


Table 1: Review of Signaling Theory Papers in Marketing Journals

Article	Research Description	Research Context	Signal Studied	Signaling Theory Components*				
				Observability	Cost	Credibility	Frequency	Consistency
Boulding and Kirmani, 1993	Quality perceptions of PCs, manipulating credibility (consumer reports ratings) and warranty length/scope	Consumer experiment - personal computers	Warranty length and scope			×		
Robertson <i>et al.</i> , 1995	The likelihood of competitive response following a new product announcement	Organizational survey - competitive response	New product announcements					×
Rao <i>et al.</i> , 1999	Manipulated credibility and type of cost (sunk vs. future) of brand allies to gauge impact on quality perceptions	Consumer experiment - televisions	Brand ally		×		×	
Erevelles <i>et al.</i> , 2001	Warranty information acts as a signal of quality for services but not for durable products for Chinese consumers.	Consumer experiment - televisions and services	Warranty					×
Martin and Camarero, 2005	Existence of quality signals as drivers of customer trust in car repair service providers	Consumer survey - car repair services	Warranty, reputation, retail chain, ambiance, service perks, advertising					×
Basuroy <i>et al.</i> , 2006	Examined the direct and interactive effects of movie-signals on box office revenue	Consumer secondary data - movies	Movie sequels, ad expenses, WOM, critics' review consensus	×	×		×	×
Erdem <i>et al.</i> , 2008	Impact of price, price variability and advertising on purchase behavior	Consumer secondary data - ketchup	Price and advertising (intensity and quality)	×				×
Bonifield <i>et al.</i> , 2010	Return policy leniency and E-tailer quality (BizRate rating) as drivers of behavioral intentions	Consumer secondary data and survey - E-tailing	E-tailer quality (website) and return policy leniency					×
Han <i>et al.</i> , 2010	Impact of brand prominence (visibility/size of logo) on price	Consumer secondary data - luxury purses	Visibility of brand logo	×				×

Table 1: Continued

Article	Research Description	Research Context	Signal Studied	Signaling Theory Components*				
				Observability	Cost	Credibility	Frequency	Consistency
Mitra and Fay, 2010	Price-ending patterns as signals for consumer service expectations	Analytical model and empirical test of e-tailer prices	Price-ending patterns					
Groening <i>et al.</i> , 2016	Firm's achievements (or lapses) towards customers and employees and the interaction between the two as signals to potential investors	Firm stock market performance using secondary data	Firm achievements directed at customers and employees			×		×
Brower <i>et al.</i> , 2017	Inconsistency of corporate social performance negatively moderates the link between corporate social performance and financial performance	Firm stock market performance using secondary data	Corporate social performance					×
Lin and Kalwani, 2018	Frequency and valence of eWOM impact on sales, and moderated by country/culture	Consumer products - secondary data from Amazon (US-Japan)	eWOM				×	
Pecot <i>et al.</i> , 2018	Brand heritage acts as a signal for brand quality leading to price premiums	Consumer experiment - existing and fictional brands	Brand heritage			×		×
Pemer and Skjolsvik, 2019	Taxonomy of dimensions and signals customers use to assess professional service quality	Qualitative - customer interviews	Qualifying and Excellence	×		×		
Cowan and Guzman, 2018	CSR and sustainability signals along with country-of-origin impacts corporate brand performance	Secondary data - 135 brands across industries and countries	Sustainability			×		

\* - according to Connelly *et al.*, (2011) review of signaling theory in management publications

Table 2: Application of Signaling Theory to Extant Relationship Failure Research

Failure Type	Citation	Context/Method	"Signal" Studied/Manipulated <sup>1</sup>	Signaling Theory Components					Implications
				Obs.	Cost	Cred.	Freq.	Cons.	
Service Failure	McCullough <i>et al.</i> , 2000	Scenario-based experimental manipulations of service recovery expectations and recovery efforts following a 3-hour flight delay.	<b>Study 1:</b> Recovery expectations : flight delay policy includes \$150 voucher (high) or no voucher (low). Recovery performance: providing (not providing) \$150 voucher in the high (low) condition. <b>Study 2:</b> Distributive justice: high/medium/no compensation offered following flight delay.		X				<b>Study 1:</b> Lower (higher) recovery expectations result in positive (negative) disconfirmation when a voucher was (not) presented. Higher recovery expectations result in lower than expected recovery evaluations. <b>Study 2:</b> Satisfaction increased with the cost of the recovery signal.
	Smith and Bolton, 2002	Scenario-based experimental manipulations of service failure and recovery efforts in the hotel and restaurant industries.	Service recovery attributes: compensation (high, medium, none); response speed (immediate or delayed); apology (present or absent); and recovery initiation (by service employee or customer).	X	X	X			High levels of compensation, presence of an apology, and recovery initiated by service provider had positive impacts on satisfaction in restaurants, but not hotels.
	Grégoire <i>et al.</i> , 2009	Scenario-based experimental manipulations of relationship quality and recovery effort in the restaurant industry.	<b>Study 2:</b> Manipulated service recovery at three levels: none; medium - partial refund and apology; high - full refund, apology, and gift.		X				Signals including medium or high cost were equally effective with high relationship quality; when relationship quality is low, high-cost signals were necessary to recover from failure.
	Joireman <i>et al.</i> , 2013	Scenario-based experimental manipulation of a double service failure in the context of an electronics retailer.	<b>Study 3:</b> Manipulated the recovery effort at four levels: no effort; apology only; compensation only; apology + compensation.		X	X			Signals including both an apology and compensation were more effective than those that only included one (or none) at reducing desires for revenge and increasing desires for reconciliation.
	Zhou <i>et al.</i> , 2013	Scenario-based experimental manipulations of economic vs. social recovery efforts in consumer group purchase contexts.	<b>Study 1:</b> Manipulated economic vs. social (apology) recovery in a public vs. private effort. <b>Study 2:</b> Manipulated economic (low, medium, high) recovery, and a public vs. private social effort.	X	X	X			<b>Study 1:</b> Economic recovery evaluated more positively when signaled publicly; social recovery more effective through private efforts. <b>Study 2:</b> Higher economic recovery associated with more favorable responses; private social recovery enhanced this effect.
	Gelbrich <i>et al.</i> , 2015	Scenario-based experimental manipulations of compensation levels in various consumer product/service contexts.	<b>Study 1:</b> Manipulated compensation amount (11 levels) and service acceptance/rejection in a music theatre scenario. <b>Study 2:</b> same manipulations in a hotel or product purchase context.		X				When customers reject service due to a service failure, partial compensation is optimal. The range of 70%-80% of the loss results in the greatest returns in satisfaction. When customers accept the service, smaller compensation amounts (0%-20%) provide the greatest returns to satisfaction.
	Basso and Pizzutti, 2016	Scenario-based experimental manipulations of deviations, recovery tactics and violation type in a hotel service failure context.	<b>Study 1:</b> Single vs. double deviation and apology vs. promise recovery efforts. <b>Study 2:</b> Recovery efforts (none, apology, promise, compensation, 3rd-party endorsement) following double deviation. <b>Study 3:</b> Recovery effort (none, apology, promise) and violation type (competence vs. integrity).		X	X			Promises more effective than: apologies following double deviations ( <b>study 1</b> ); apologies, compensation or 3rd party endorsements ( <b>study 2</b> ); and following competence violations; whereas apologies are more effective for integrity violations. <b>Study 2</b> manipulates signal cost; all studies manipulate signal credibility.

Table 2: Continued

Failure Type	Citation	Context/Method	"Signal" Studied/Manipulated <sup>1</sup>	Signaling Theory Components					Implications
				Obs.	Cost	Cred.	Freq.	Cons.	
Brand Transgression	Puzakova <i>et al.</i> , 2016	Scenario-based experimental manipulations of color of ads used following a product defect and the firm's recovery response.	<b>Study 2:</b> Firm recovery response manipulated: denial vs remedy. <b>Study 3:</b> Firm recovery response manipulated: denial vs apology vs remedy.		X	X			Product replacement (remedy) results in more favorable outcomes compared to an apology or denial.
	Puzakova <i>et al.</i> , 2013	Scenario-based experimental manipulations of brand anthropomorphism, implicit theory perspectives, and firm responses following a product defect.	<b>Study 3:</b> Firm response manipulation (denial, apology, compensation) and timing of response manipulation (pre vs post firm response)		X	X			Product repair along with future purchase discount (compensation) results in more favorable outcomes compared to an apology or denial.
	Aaker <i>et al.</i> , 2004	Longitudinal consumer panel experimental design manipulating brand personality, transgression, time, and recovery response.	<b>Study 1:</b> Firm response manipulating apology and recovery response (recovery of lost online photo files) and brand's personality style communication (sincere vs exciting)		X	X			Recovery efforts that restore the lost online product files lead to higher levels of relationship strength for exciting brand personalities compared to sincere brands.
Product Harm Crisis (PHC)	Dawar and Pillutla, 2000	Scenario-based experimental manipulations of product harm crises in the soft-drink and computer industries.	<b>Studies 2 and 3:</b> Manipulated prior brand expectations (strong positive vs. weak) and firm response (1: apology, recall, and restitution vs. 2: public notice of defect vs. 3: no response).	X	X	X			Responding with a higher cost signal (product recall and restitution) has a positive direct effect on brand equity. Higher cost signal is especially effective when consumers have weak expectations about the brand.
	Cleeren <i>et al.</i> , 2008	Analysis of household scanner data and weekly advertising spending of the target and competitive brands.							While the advertising did not constitute a signal regarding the product harm crisis, this is one of few PHC research articles to investigate advertising as a post-transgression strategy and investigate advertising's effect on consumer purchases.
	Cleeren <i>et al.</i> , 2013	Analysis of household scanner data, weekly advertising, price adjustments, negative publicity and whether the affected brand acknowledged blame.	Public acknowledgement of blame following consumer goods product crises.	X		X			Findings show effective strategies when the product crisis is the fault of the affected brand (must publicly admit guilt): if negative publicity is low, do not increase advertising and decrease price; if negative publicity is high, increase advertising and decrease price.

1 - Only those studies that manipulated one of the five signaling components are included in the table.

Table 3  
Study 1: Univariate ANOVA Results

Source	df	Dependent variable: Trust			Dependent variable: Satisfaction			Dependent variable: Willingness to reconcile		
		Mean Square	F-value	Sig.	Mean Square	F-value	Sig.	Mean Square	F-value	Sig.
Corrected Model	5	10.77	6.24	0.00	13.57	10.05	0.00	8.25	7.15	0.00
Intercept	1	99.74	57.76	0.00	81.63	60.46	0.00	127.05	110.07	0.00
Error	134	1.73			1.35			1.15		
Total	140									
Corrected total	139									
<i>Main effects</i>										
Signal Strength ( $H_1$ )	1	47.82	27.69	0.00	44.88	33.24	0.00	15.19	13.16	0.00
Violation Type	1	2.24	1.30	0.26	8.65	6.40	0.01	20.98	18.18	0.00
<i>Covariates</i>										
Gender	1	0.65	0.37	0.54	0.97	0.72	0.40	4.43	3.84	0.05
Age	1	1.52	0.88	0.35	1.53	1.13	0.29	1.04	0.90	0.34
<i>Interaction effects</i>										
SS × VT ( $H_2$ )	1	6.26	3.63	0.06	0.02	0.01	0.91	5.88	5.10	0.03



Table 4  
Study 2: Univariate ANOVA Results

Source	df	Dependent variable: Trust			Dependent variable: Satisfaction			Dependent variable: Willingness to reconcile		
		Mean Square	F-value	Sig.	Mean Square	F-value	Sig.	Mean Square	F-value	Sig.
Corrected Model	5	3.73	2.87	0.02	0.19	0.30	0.91	5.01	4.89	0.00
Intercept	1	71.90	55.31	0.00	72.39	114.18	0.00	70.83	69.17	0.00
Error	151	1.30			0.63			1.02		
Total	157									
Corrected total	156									
<i>Main effects</i>										
Signal Frame ( $H_3$ )	1	8.45	6.50	0.01	0.61	0.96	0.33	5.17	5.05	0.03
Violation Type	1	10.40	8.00	0.01	0.02	0.03	0.87	18.67	18.23	0.00
<i>Covariates</i>										
Gender	1	0.01	0.00	0.95	0.00	0.00	0.99	0.11	0.11	0.74
Age	1	0.12	0.09	0.76	0.20	0.31	0.58	0.01	0.01	0.91
<i>Interaction effects</i>										
SF × VT ( $H_4$ )	1	0.30	0.23	0.63	0.00	0.00	0.98	0.52	0.50	0.48

Table 5  
Study 3: Univariate ANOVA Results

Source	df	Dependent variable: Trust			Dependent variable: Satisfaction			Dependent variable: Willingness to reconcile		
		Mean Square	F-value	Sig.	Mean Square	F-value	Sig.	Mean Square	F-value	Sig.
Corrected Model	6	13.52	9.05	0.00	12.77	19.56	0.00	16.76	9.12	0.00
Intercept	1	39.71	26.59	0.00	25.65	39.30	0.00	19.62	10.68	0.00
Error	94	1.49			0.65			1.84		
Total	101									
Corrected total	100									
<i>Main effects</i>										
Signal Strength	1	0.87	0.58	0.45	0.54	0.83	0.36	0.23	0.13	0.72
Brand Familiarity	1	3.96	2.65	0.11	5.37	8.23	0.01	7.07	3.85	0.05
<i>Covariates</i>										
Gender	1	0.13	0.09	0.77	0.00	0.00	0.97	0.25	0.14	0.71
Age	1	0.03	0.02	0.90	0.04	0.06	0.81	1.88	1.02	0.32
Brand equity	1	50.13	33.56	0.00	50.72	77.71	0.00	61.03	33.21	0.00
<i>Interaction effects</i>										
SS × BF ( $H_5$ )	1	4.27	2.86	0.09	4.40	6.74	0.01	7.23	3.93	0.05

## Appendix A - Survey Measures

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### Multi-item measures

*Willingness to reconcile\** (Wang and Huff, 2007)

I am willing to forgive [brand name].

I can truly forgive [brand name] as no serious harm has been done.

[brand name] did not intentionally cause the problem.

*Trust\** (Sirdeshmukh *et al.*, 2002)

I believe that [brand name] has the expertise necessary to solve the problem.

I believe [brand name] will keep its promises in the future.

I trust [brand name].

*Satisfaction with the response\** (Morgeson *et al.*, 2015)

I am satisfied with [brand name] response to the problem.

[brand name] has exceeded my expectations.

[brand name] has fallen short of my expectations.

Overall, I am satisfied with [brand name].

*Brand equity\** (Sirianni *et al.*, 2013)

[brand name] is the best brand in its product class.

[brand name] really "stands out" from other retail clothing brands.

I am willing to pay more for [brand name] than other comparable brands.

Compared with other brands, [brand name] is a good value for the money.

### Manipulation checks

*Study 1*

Would you describe the problem that [brand name] customers experienced as more competence-based (i.e. a result of an accidental error on [brand name] part) or integrity-based (i.e. the result of deliberate attempt by [brand name] to deceive its customers)?\*\*

How strong was [brand name] response to the problem?\*\*\*

*Study 2*

[brand name] offer to its customers in response to the problem is generous\*

*Study 3* (Alba and Hutchinson, 1987; Dawar and Lei, 2009)

How familiar you are with [brand name]? \*\*\*\*

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\* captured on a 7-point scale ranging from (1) strongly disagree to (7) strongly agree.

\*\* captured on a 7-point scale ranging from (1) integrity to (7) competence.

\*\*\* captured on a 7-point scale ranging from (1) weak to (7) strong.

\*\*\*\* captured on a 7-point scale ranging from (1) not familiar at all to (7) very familiar.

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## Appendix B - Manipulations

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### Studies 1 and 2

#### *Violation Type Manipulations*

##### Integrity Condition

*Last month RINNA suffered a major data breach that exposed its customers' sensitive data including debit and credit card information. The data breach was exposed by a newspaper report stating that RINNA had deliberately neglected cyber security checks in order to focus on attracting new business.*

##### Competence Condition

*Despite their security measures, last month RINNA suffered a major data breach that exposed its customers' sensitive data including debit and credit card information.*

#### *Signal Strength Manipulations*

##### Strong Condition

*RINNA immediately published a press release issuing a public apology and promised to fix the problem as a matter of urgency. In addition, they announced investment of one million pounds in a new data encryption system that will allow them to protect customer information in the event of a security breach in the future.*

##### Weak Condition

*RINNA immediately published a press release blaming its 3rd party IT supplier. In addition, it issued a public apology and promised to address this issue immediately.*

#### *Signal Frame Manipulations*

##### Firm Cost Condition

*RINNA announced investment of one million pounds in a new data encryption system that will allow them to protect customer information in the event of a security breach in the future.*

##### Customer Gain Condition

*RINNA announced that they would give all affected customers a 50% discount on their monthly bill for the next 6 months (up to £170 per customer)*

### Study 3

#### *Signal Strength Manipulations*

##### Strong Condition

*(selected brand) immediately issued a public apology, explaining they have recently established a process for affected customers to get help for any medical issues caused by this substance and offering a full refund on any affected products.*

##### Weak Condition

*(selected brand) immediately issued a public apology, blaming their 3rd party supplier for the problem and announcing they will be switching suppliers.*

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