CLIMBING OUT OF THE HOLE OR DIGGING DEEPER: A MODEL OF CUSTOMER REACTIONS TO PRODUCT RECALLS AND RECALLING FIRM RESPONSES

By

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ABSTRACT

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Despite an increased focus on product recalls in the business press in recent years, management research examining product recalls and ensuing strategic outcomes has been relatively narrow in scope. Specifically, the process by which firms and their managers navigate their way through recall events has largely been left unexplored despite the importance of such management efforts in limiting the overall negative effect of the recall on performance outcomes. In my dissertation, I leverage insights from related literatures in organizational perception management and crisis management to develop a model detailing how the manner in which firms respond to their product recalls influences customers' reactions. Specifically, firms can respond in the media utilizing apologies, denials, excuses, and justifications, and these response strategies are likely to influence customers' perceptions of and reactions to the focal recall. Further, the effect of these firm responses is likely to be contingent on important characteristics surrounding the recall. Thus, I develop and test a contingency model of the effectiveness of firm responses in limiting or, in some circumstances, exacerbating the potential negative backlash from customers to product recalls using a sample of product recalls overseen by the Food and Drug Administration.

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INTRODUCTION

Product recalls, conducted when products are determined to cause potential safety issues to customers and the public at-large, are widely and very understandably considered to be harmful to company reputation (Fombrun and Shanley, 1990) which ultimately has important implications for shareholder wealth (Jarrell and Peltzman, 1985; Pfarrer, Decelles, Smith, and Taylor, 2010). Recall announcements made by firms are violations of the social expectation that customers will remain unharmed by the use of the firm's products. This can have substantial implications for offending firms' relationships with their customers and other stakeholders in attaching a negative stigma to the firm. Rarely has that been more evident than in recent years in the automobile industry with giants such as Toyota and General Motors, as the former was dealt record penalties from the United States Department of Justice and the latter experienced incredible amounts of negative press coverage for much of 2014. Beyond these and other consequences from stakeholders, recalls also reveal issues within the firm, facing management with a pressing strategic issue through which they need to navigate the firm.

However, despite the recent attention paid to product recalls in the business press, strategic management research on recalls has left some important aspects of the recall process largely unexplored. Though much of the research has focused on antecedents to recalls (Thirumalai and Sinha, 2011; Wowak, Mannor, and Wowak, 2015; Zavyalova, Pfarrer, Reger, and Shapiro, 2012) or their market consequences (Bromiley and Marcus, 1989; Davidson and Worrell, 1992; Rhee and Haunschild, 2006), the literature leaves us with an incomplete portrait of the management of the recall process in at least two important ways. First, relatively little research has been conducted about the manner in which executives actually manage their way through the aftermath of product recalls and the influence that management has on important

outcomes of this recall process. Specifically, firms are likely to react and respond to this process very differently, and these responses are likely to influence stakeholders' assessment of their relationship with the firm moving forward. Second and more generally, though management researchers have explored some important consequences of recalls, the literature has largely left unexamined the influence of different dimensions of recalls on important outcomes. These dimensions are likely to be especially important to managers attempting to navigate their way through the recall process while minimizing harm to stakeholder relationships. Thus, recall characteristics and how stakeholders are likely to interpret them may also affect those stakeholders' assessments of managerial responses, suggesting that responses to recalls should vary depending on the specific circumstances of the recall event.

Exploring product recalls in this manner should be of particular interest to strategic management scholars not just because recalls constitute distinctly negative events for organizations and their managers but also because they have unique implications for the relationship between the firm and its external stakeholders, particularly its customers. The firm's relationship with customers requires the customer base to implicitly trust the firm to provide products that do not threaten their safety and well-being (Siomkos and Shrivastava, 1993). As a result, recalls of unsafe or otherwise defective products threaten the relationship between the firm and its customers' expectations are violated, potentially causing them to reassess their relationship with the firm. Further, the effects of such an expectancy violation, in contrast to many other types of events that may be more relevant to the organization's reputation (Fombrun and Stanley, 1990; Lange, Lee, and Dai, 2011), status (Podolny, 1993; Washington and Zajac, 2005), or other social constructs, have the potential to threaten customers in a deeper and more emotional fashion (Fediuk, Coombs, and Botero, 2010). That said, recalls are likely to

vary considerably on important criteria that affect the intensity of customer reactions and the appropriateness of managerial response, further suggesting the importance of tailoring theory specifically to product recalls rather than more general models of crisis, misconduct, or stigma.

This notion has important implications for recalling firms and their managers attempting to navigate their way through a given recall event, namely that there is unlikely to be a particular type of response that will successfully mitigate a negative customer reaction in every recall situation. Such a "one-size-fits-all" approach would ignore crucial insights from research on the importance of situating the response to the particular circumstances of a threatening event (Coombs, 1995; Tomlinson and Mayer, 2009). Thus, despite recent theoretical advances in crisis management that generally argue that firms should be accommodative following their recall events (Bundy and Pfarrer, 2015), such arguments largely fail to consider the many circumstances in which recalls are neither salient to customers nor highly attributable to the recalling firm. Instead, firms would be better served considering the nature of their recall before determining their course of action in order to avoid overreaction (Coombs and Holladay, 2007; Patel and Reinsch, 2003) or inappropriateness (Kim, Ferrin, Cooper, and Dirks, 2004, 2004; Kim, Dirks, Cooper, and Ferrin, 2006) in their response. However, research has seldom examined product recalls, and especially the manner in which firms manage the post-recall process, using this logic and framework. Thus, in light of the complexity inherent to product recalls and the appropriate management of the post-recall process, I will integrate theory and insights from crisis management (Coombs, 2007; Laufer and Coombs, 2006), organizational perception management (Elsbach, 2003), and trust repair (Kim et al., 2004; 2006; Tomlinson and Mayer, 2009) in order to describe and explain the relative effectiveness of various managerial responses to product recalls and the customer reactions that result. Integrating these literatures is

the most beneficial approach to building theory around a particular process that is unlikely to neatly fit into any of these existing frameworks and will help to push the product recall literature forward by enabling it to answer crucial questions regarding an important and unique mandate for many organizations' managers.

Altogether, in building theory more specifically tailored to product recalls and the implications they carry for firms and their customers, the literature can progress towards a more thorough exploration of the management of recalls, particularly in their aftermath. Managers can and often do vary in their strategic approaches and communication with stakeholders following a recall event, which is likely to result in a wide variety of outcomes pertaining to their financial, product, or any other stakeholder-related performance. Though my study intends to focus on their communicative efforts and how customers are likely to react to that communication, future research can leverage my theory of recall management and examine questions pertaining more to managers' internally-focused strategies or outcomes pertaining to other stakeholders that are likely to be affected by product recalls. More generally, despite its increasing prevalence in many industries and coverage in the business press, the strategic management literature on recalls has been surprisingly deficient in exploring the management of organizations through the post-recall management research.

Recall examples

Management research on recalls has taken a preliminary examination into the reactions of various stakeholders to product safety recalls, from shareholder reactions (Bromiley and Marcus, 1989; Davidson and Worrell, 1992; Rhee and Haunschild, 2006) to media coverage (Zavyalova

et al., 2012). However, this research has thus far largely failed to more fully integrate crucial recall characteristics into the more general relationship between recall management and stakeholder reactions. In the marketing literature, however, some earlier scholars considered recall characteristics more fully (e.g.: Mowen, 1980; Mowen, Jolly, and Nickell, 1981; Siomkos, 1989) but often relied on experimental or survey methods in determining which characteristics were important rather than actual behaviors in response to real product recalls. Further, few attempts have been made to identify how managers should respond to their firms' recall in light of these recall characteristics. Because of these gaps in the overall recalls literature, I seek to more directly explore in this dissertation how product safety recalls featuring different characteristics can dramatically influence the effectiveness of firm responses in achieving better customer-related outcomes. For context, I start by describing two recalls in similar industries and identifying important differences that resulted in contrasting customer reactions.

Beginning in January of 2008, the Baxter Healthcare Corporation conducted a sequence of voluntary recalls of its products containing heparin, a drug on the World Health Organization's essential medicines list. The heparin used by Baxter was largely imported from Chinese suppliers, where authorities traced the contamination of the drug. Altogether, the U.S. Food and Drug Administration (FDA) linked the heparin contamination to as many as 81 deaths and hundreds of other serious illnesses (Harris, 2008), many of which occurred in patients administered Baxter products. However, Baxter's reported sales in the four quarters following the heparin recalls largely remained stable and improved upon the sales figures from the previous year's corresponding quarter. This was in large part due to the complicit nature of the Chinese suppliers' involvement in the product safety issue in conjunction with Baxter's own proactivity

in identifying and correcting the issue, allowing Baxter to largely avoid substantial loss moving forward despite the severity of their recalls.

By contrast, in January of 2010, Johnson and Johnson issued the first of multiple major recalls of a wide variety of its products, from over-the-counter drugs such as Tylenol to prescription drugs to medical devices. Johnson and Johnson's recall, rather than remaining isolated to one overall safety violation, was prevalent throughout the corporation, touching all of its major divisions. The FDA sternly warned the company as a result of its delayed and careless response to initial complaints (Kavilanz, 2010), though it never was able to clearly link Johnson and Johnson's product safety issues to any consumer deaths (Singer and Abelson, 2011). However, the damage had been done to Johnson and Johnson's relationship with its customers, as its U.S. sales in the following four quarters fell when compared to the corresponding previous year's quarter. This was especially true in its consumer product sales, which featured steep declines in sales, including a nearly 30 percent drop in fourth quarter of 2010 compared to the fourth quarter of 2009.

Despite health consequences that ended up as less severe than those of Baxter's safety issues, Johnson and Johnson fared much worse in maintaining and repairing its relationship with its customers. Specifically, Baxter was proactive in its response while making it clear to stakeholders that the actual source of the issue was from an outside supplier, a response that proved appropriate for the particular circumstances of their recall event. Johnson and Johnson, on the other hand, was much more delayed in its response and ultimately tried to distance itself from a safety issue that pervaded nearly the entirely corporation and was clearly, in the public's eye, their responsibility. The inappropriateness of Johnson and Johnson's response to a recall that required a far more accommodative approach exacerbated the damage done to their

relationship with customers, whereas Baxter handled its response far more appropriately and escaped relatively unscathed. My dissertation is centered on this argument that firm responses must "match" the actual circumstances surrounding their recall (Bundy and Pfarrer, 2015; Coombs and Holladay, 2004), as I build theory around what constitutes a match between recall characteristics and recalling firm responses. Generally, the recall characteristics focus on the degree to which a recall reflects the dimensions of a crisis, and the firm's response represents a match – or a mismatch – depending on how well it speaks to and corrects the particular crisis dimensions relevant to the recall. Thus, rather than relying on broad-based propositions of best practices from the crisis management literature, my theory represents a more nuanced look at what makes a recall an actual crisis and how firms should respond whether or not it actually reaches the level of a crisis.

Contributions

I propose a number of contributions to the multiple literatures on which I draw in this dissertation. First and foremost, I address gaps in the literature on product recalls, particularly those pertaining to post-recall management, by focusing specifically on how managers differentially address their firm's recalls, which has potential implications for important firm outcomes. This represents an important process issue in a recall literature that tends to focus on antecedents and firm-level outcomes of recalls without enough consideration for the actual management of recalls in their aftermath. Further, my theory suggests that there is no "one-size-fits-all" approach to managing recalls, as best practices for managing stakeholder relationships following recalls are highly contingent on the nature of the recall itself.

Second, and more generally, I contribute to research in the recall literature by being among the first to theoretically and empirically examine the role of important characteristics of recalls on strategic outcomes of this process. Though some researchers in other disciplines have provided some insights into this particular query, there remains a distinct lack of organizing framework around these important distinguishing characteristics that could broadly serve to benefit research on recalls as well as various other troublesome organizational events.

Third, and relatedly, I contribute to theory and research on crisis management by more fully considering the degree to which a particular negative event actually constitutes a crisis and the effect that may have on the relationship between crisis management efforts and important outcomes. Research on crises often considers only highly negative events or, alternatively, considers all events of a certain type (e.g.: executive scandals or industrial accidents) to uniformly reflect a crisis through which managers need to similarly govern. Unfortunately, this limits the applicability of this research for many negative corporate events that are likely to vary considerably in terms of the degree to which they represent a crisis, an issue that my model will seek to address by considering characteristics of product recalls.

Fourth, in my focus on the firm communications following crucial events that are central to the organizational perception management framework, I will evaluate the relative effectiveness of firms that apologize, deny, excuse, or justify their recall event. Importantly, these four types of communications (called "accounts") have been theorized broadly as the categories of possible responses to negative events (Elsbach, 2003; Schonbach, 1980; Scott and Lyman, 1968; Szwajkowski, 1992). However, my theory is among very few examples of research simultaneously examining all four primary forms of accounts firms can employ following their negative events. Specifically, whereas most research on these accounts has

chosen to focus on one or two of these forms, my work integrates all four to more comprehensively examine how firms can address their recalls and how customers respond as a result, helping to resolve an important blind spot in the literature. Further, I seek to develop a novel empirical approach to capture each of these forms of accounts, distinguish them from one another, and finally demonstrate their nuanced differences in their effects on important outcomes. Altogether, by integrating insights from distinct but related literatures and rigorously assembling nuanced and important recall characteristics and firm responses, my model represents a novel theoretical and empirical approach to answer essential and interesting questions regarding the management of product recalls.

LITERATURE REVIEW ON PRODUCT RECALLS

The literature on product recalls is a multi-disciplinary one and includes research from scholars in finance and economics, management, marketing, and operations and supply chain. This, of course, is understandable, as product recalls involve important issues pertaining to many aspects of the firm, ranging from top-level management to lower-level value chain activities, and have important consequences, both financial and otherwise, for recalling firms. Despite this research from across disciplines, there still remain important gaps in our understanding of the product recall process that could benefit not just management research but other disciplines as well. In light of the cross-discipline nature of product recall research, I will review in this section much of the important work across the aforementioned fields relevant to my study and articulate how my study can contribute to this literature in its current state.

Product recalls have become an increased focus of the business press, due in large part to a spate of high-profile cases of recalls that have captured national and international attention. For example, the automobile industry, an industry in which product recalls are fairly common, has earned significant attention for recalls from automaker General Motors and air bag supplier Takata, as those recalls have substantially endangered the public despite the firm knowing for years that their products were problematic. Additionally, the recent Listeria outbreak, involving companies such as Blue Bell Creameries and Sabra Dipping Company, aroused public fear of the life-threatening contamination in many popular food items. Add in other recalls of products such as Graco's baby strollers, IKEA's cribs, or Purina's and others' dog foods that have caught significant amounts of social and other media attention, and product recalls have suddenly become a constant in the collective consciousness of business leaders, consumers, and commentators.

Management Research on Product Recalls

Despite this increase in public focus and its importance for the executives of many companies, strategic management research has yet to match that attention on product recalls. That said, some important contributions have been made to establish the strategic importance of recalls and understand the crucial role top executives in recall events. Much of the earlier management work on recalls focused primarily on shareholder reactions to recall announcements (Davidson and Worrell, 1992), which tend to be negative but are largely ineffective as deterrents to future recall incidents (Bromiley and Marcus, 1989). Rather, firms are more likely to avoid future product recalls as they volitionally learn from their recalls (Haunschild and Rhee, 2004). Perhaps more than any other management study, Wowak, Mannor, and Wowak (2015) asserted the importance of the firm's executives for its product recalls, linking CEO incentives and characteristics to the incidence of recalls. Other recent studies have again placed the focus on market responses to recalls, finding that these responses may be affected by the firm's reputation (Rhee and Haunschild, 2006) and structure (Thirumalai and Sinha, 2011). Other researchers have gone beyond simply market responses to recalls to examine how much media attention a firm receives for their recall (e.g.: Zavyalova et al., 2012).

With these studies, an overall management model of product recalls has seemingly begun to emerge. This model links important antecedents to recalls, such as managerial compensation and organizational experience, important concepts from the strategic management literature. Further, the model connects the relationship between recalls to important strategic outcomes, such as shareholder reactions and media coverage. Finally contingent factors of both the antecedent-recall (e.g.: CEO observable characteristics) and recall-outcome (e.g.: organizational reputation) relationships have been explored. However, this model has largely failed to describe

and explain important process issues related to recalls, specifically how the firm responds to their recall events and the subsequent implications of those responses. For example, firms are likely to differ in the manner in which they communicate the nature of the recall incident to stakeholders, and these impression management efforts are likely to alter stakeholder perceptions of the event. Further, recalls themselves are likely to vary on a number of different criteria that affect how stakeholders are likely to judge the seriousness of the recall event or the firm's reliability to produce safe, quality goods. In sum, despite some advancements made by prior management scholars on product recalls, there still remain gaps in our understanding of the product recall process that are important for future researchers to address.

Operations and Supply Chain Research on Product Recalls

Research from supply chain and operations typically address the within- and betweenfirm activities wherein failures and subsequent safety concerns arise; thus, much of the research pertaining to product recalls is focused on antecedents to product recalls (Wowak and Boone, 2015). For example, Roth and colleagues (2008) detail the "six Ts" of supply chain management – traceability, transparency, testability, time, trust, and training – that contribute to production quality in ways that can allow firms to avoid recalls. Upholding these ideas is complicated by a supply chain for any given product that often spans not just multiple firm boundaries but national boundaries as well (Lyles, Flynn, and Frohlich, 2008). Further, isolated examples of research have detailed how recalls of different types can emerge from different supply chain resource endowments and orchestrations, which affects the possible fallout for firms and their stakeholders (Ketchen, Wowak, and Craighead, 2014). Finally, the operational failings that contribute to product recalls (e.g.: manufacturing defect versus design flaw) can have varying

implications for the time it takes for firms to recognize safety issues and actually recall their failing products (Craighead, Blackhurst, Rungtusanatham, and Handfield, 2007; Hora, Bapuji, and Roth, 2011). The important takeaway from this research and its focus on the technical supply chain issues that lead to product recalls is that product safety issues can result from a variety of causes and features that can affect recalls' ultimate outcomes for firms and their stakeholders, a notion that is likely to be important for recall firms' managers seeking to navigate their way through the aftermath of the product recall.

Finance and Economics Research on Product Recalls

In contrast to the supply chain work around the antecedents to recalls, research in finance and economics is typically focused on the market consequences of recalls. Quite a few studies have explored the shareholder wealth consequences resulting from recalls, with relatively mixed findings ranging from significant penalties to shareholders (Jarrell and Peltzman, 1985) to little to no effect whatsoever (Hoffer, Pruitt, and Reilly, 1988). In the automobile industry, these equivocal results may be partially explained by the importance of the actual component that is defective in a recall, with recall announcements of air bag defects negatively influencing market responses (Rupp, 2003). In cases of food contamination, shareholder losses might be limited to bacterial infections such as E. coli or Listeria that have potentially deadly consequences for consumers (Thomson and McKenzie, 2001). In general, any negative consequences following recalls might be the result of indirect costs such as litigation or reputation loss months that are not captured by the reaction immediately following the recall announcement (Pruitt and Peterson, 1986), suggesting short-term event studies may be missing much of the fallout from product recalls.

Despite a heavy focus on the shareholder consequences of product recalls, a few studies have explored the impact of recalls on customer behaviors. For example, Freedman, Kearney, and Lederman (2012) find that toy manufacturers experience sales losses following recalls, but that those sales losses tend to be concentrated on other toys in the same category rather than spilling over into other types of toys. Relatedly, demand for recalled automobile models with severe defects typically declines, and competing manufacturers benefit from the drop in demand of the recalled model (Reilly and Hoffer, 1983). That said, in other industries, such as meat production, competitors do not experience this same benefit, as any increase in substitute demand is often offset by a negative effect on meat demand in general, causing customers to seek out non-meat products instead (Marsh, Schroeder, and Mintert, 2004). Altogether, and more generally, these studies point to the importance of investigating longer-termed outcomes rather than more commonly-employed short-term abnormal return measures, including those focused on stakeholders other than shareholders, such as the customers that are the constituency most directly affected by the underlying safety concerns of product recalls.

Marketing Research on Product Recalls

The focus on customers' reactions to product recalls is especially salient to marketing research that addresses recalls and, more generally, "product-harm crises". Product recalls are important in a marketing context, simply, because customers tend to react poorly to recalls, potentially changing their consumption decisions (Folkes, 1984). More indirectly, recalls can limit the effectiveness of future marketing efforts from the firm as consumers' sentiment towards the firm is negatively affected (Van Heerde, Helsen, and Dekimpe, 2007). Other studies have explored importantly contingencies to these negative consequences of product recalls on

customer behavior. For example, Rubel, Naik, and Srinivasan (2011) found that firm advertising in advance of recall announcements can help to mitigate some of the potential negative effects. More generally, firms that are associated with their corporate social responsibility (CSR) efforts can similarly withstand these negative effects by shifting attributions away from the firm (Klein and Dawar, 2004). In some cases, the firm's CSR might be more influential on customer sentiment following recalls than their perceived ability (Kim, 2014). Interestingly, Germann and colleagues (2013) found that customers' commitment to the company can both attenuate and augment their negative responses to recalls depending on the severity of the recall itself.

Altogether, the majority of these and other studies discuss consumer-related constructs such as brand attributions (Kim, 2014), brand commitment (Germann *et al.*, 2013), brand equity (Dawar and Pillutla, 2000; Dutta and Pullig, 2011), purchase intentions (Lin *et al.*, 2011), and trust (Yannopoulou, Koronis, and Elliott, 2011) to detail their sentiments towards the recalling firm. However, these studies often rely on experimental or survey study designs rather than actual consumer behavior. Other studies leverage real product recalls but with a case study design (Van Heerde, Helsen, and Dekimpe, 2007; Zhao, Zhao, and Helsen, 2011), while others opt to investigate stock market reactions to recalls (Chen, Ganesan, and Liu, 2009; Lee, Hutton, and Shu, 2015) rather than the customer reactions that are more directly related to marketing theory and research. Unfortunately, there are very few examples of quantitative studies examining real consumer behavior following product recalls (e.g.: Cleeran, van Heerde, and Dekimpe, 2013) despite the importance and salience of these outcomes following product recalls.

In addition to these studies regarding the effects of recalls on customer sentiments and the contingency of those effects, it is important to acknowledge some earlier work detailing the important characteristics of the recall itself that are likely to influence these customer-related and

other constructs. The work of Mowen and colleagues largely drove this line of inquiry. For example, Mowen's initial study (1979) of consumer perceptions of recalls indicated the importance of the firm's time to recall, recall history, and the severity of the focal recall for customer reactions. Mowen's ensuing study (1980) included the importance of the intervention of regulatory bodies to the growing list of important recall characteristics. Mowen turned these initial ideas into a more detailed empirical analysis, surveying respondents regarding four actual recalls (conducted by Conair, Corning, Ford, and Firestone) and finding some support for the importance of the aforementioned characteristics (Mowen, Jolly, and Nickell, 1981). Altogether, Mowen and colleagues' work advanced 13 characteristics of recalls and the coverage surrounding them as important to consumer reactions (Siomkos, 1989). Unfortunately, outside of few studies that typically isolate one of these characteristics, marketing research has largely failed to advance this early work, especially as it translates to actual consumer behavior.

Finally, and particularly relevant to my study, there are examples of important marketing studies that investigate not just customer reactions to recalls but to the firm's follow-up responses to those recalls as well (Laufer and Coombs, 2006). Cleeren (2015), for example, assesses the literature to provide insights regarding the effectiveness of pricing and advertisement to limit the damage recalls can have on the brand. Another study considers these mechanisms in conjunction with the publicity surrounding a given product recall event (Cleeren, van Heerde, Dekimpe, 2013). More relevant to my study, others look more closely at the "crisis management" (Dawar and Pillutla, 2000; Siomkos, 1989) or "trust repair" (Xie and Peng, 2007) efforts from firms largely via their communications. Interestingly, some relatively equivocal findings have emerged, with support for "super effort" as the best response to improve customer reactions (Siomkos and Shrivastava, 1993) and alternative support for more passive strategies as

the best response (Chen, Ganesan, and Liu, 2009). Further, there is some indication that the best response is contingent on other factors (Siomkos and Kurzbard, 1994), likely signifying the importance of considering Mowen's (and, perhaps, other) recall characteristics in conjunction with firm responses.

Important Gaps in the Overall Product Recall Literature

In sum, what has emerged from this review of the various disciplines' literatures on product recalls are some important gaps that have largely yet to be addressed despite being particularly important for recalling firms and their executives. Most importantly, the management literature on recalls has remained largely silent on important process issues, particularly those pertaining to managerial responses to recalls and how those responses might affect the firm's relationship with important stakeholders, such as customers. To help explore these important processes, studies from supply chain research have indicated that not all recalls emerge monolithically, and that these differences between recalls can actually have important implications for recall outcomes. Further, research from finance indicates that rather than shortterm market consequences, future studies might be better focused on longer-termed outcomes that pertain to stakeholders such as customers that may be more directly impacted by product recalls. Marketing research extends this logic by discussing constructs such as "trust" and "purchase intentions" that are particularly impacted by product recalls. Unfortunately, however, marketing research is limited in that it tends to rely on experimental or survey data rather than actual consumption from sales and has not developed earlier work that discusses the important characteristics of recalls that are likely to influence customer-related outcomes. Altogether, I will seek to address each of these important gaps from the various product recall literatures to, above

all else, contribute to the management literature by achieving crucial insights into the outcomes of various recall management efforts, particularly in light of important characteristics of the recalls.

LITERATURE REVIEW ON ORGANIZATIONAL PERCEPTION MANAGEMENT

Elsbach (2003: 298) defines organizational perception management as "actions that are designed and carried out by organizational spokespersons to influence audiences' perceptions of the organization." Importantly, this definition includes four key components that are central to the framework of and research on organizational perception management – perceptions, actions, spokespersons, and audiences. Research on this topic largely borrows from social psychological theories, such as impression management theory (Schlenker, 1980), and applies their core theoretical concepts to the organizational level. The broad framework articulated by Elsbach (2003) includes both general and specific perceptions, symbolic and practical actions, formal and informal spokespersons, and external and internal audiences. I detail each of these categories in this section and key findings from research that indicate the importance of perception management from firms.

Elsbach (2003) describes three types of perceptions that organizations attempt to manage – images, reputation, and identity. Organizational identity is largely relevant to insider audiences (Dutton, Dukerich, and Harquail, 1994), thus making it less central to my study of recalls and customer reactions than the other two categories of perceptions. Organizational reputation, on the other hand, pertains to external audiences' general perception of the firm, and the degree to which it is esteemed by its constituents (Fombrun, 1996). Scholars have articulated the multi-dimensional nature of reputation (see Lange *et al.*, 2011 for a review), but each of these dimensions speak to a relatively enduring, global assessment of the firm. Further, research on product recalls has shown recalling firm reputation can be both changed as an outcome of a recall event (Devine and Halpern, 2001) and influential to other important recall outcomes (Rhee and Haunschild, 2006; Siomkos and Kurzbard, 1994).

Finally, organizational images represent more specific assessments made by both external and internal audiences of the firms that tend to be highly variable due to their temporary nature (Elsbach, 2003). These images include legitimacy (Chen and Meindl, 1991), consistency (Ross and Staw, 1993), and trustworthiness (Barney and Hansen, 1994). Though practitioners and scholars alike tend to use "reputation" as a catch-all description of the potential fallout from negative events such as product recalls, these more specific images may actually be more relevant to these situations despite relatively little scholarly attention. For example, organizational trustworthiness is likely to be particularly important to a firm's relationship with its customers, and this can be lost following a recall in which customers may fear for their safety with the consumption of a firm's products. More generally, these different types of perceptions of organizations (e.g.: images, reputation) tend to be studied individually, but the recall context is one in which multiple perceptions are likely influenced; thus, it may be instructive to speak to the effects of perception management on a collective set of related-but-distinct perceptions rather than simply one.

Further, the organizational perception management framework details the actual spokespersons tasked with conveying messages about the organization to audiences. These typically include, of course, the organization's leaders and dedicated public relations individuals as well as the organization's employees more generally. Individuals from the former category are typically the ones who address important events in their aftermath (e.g.: D'Aveni and MacMillan, 1990), as audiences are particularly attuned to the actions of these leaders for their assessments of the firm (e.g.: Salancik and Meindl, 1984; Hayward, Rindova, and Pollock, 2004). That said, other lower levels of employees often act as spokespersons, who actions affect audience perceptions of the organization. For example, hospital employees purposely use tactics

to manage expected challenges from patients to their billing (Elsbach, Sutton, and Principe, 1998). Though lower level members of the organization can manage perceptions in ways that benefit the organization, their actions may also reflect poorly on the organization, requiring additional efforts to improve those perceptions (Elsbach and Sutton, 1992). My study of product recall responses by firms focuses on top-level management and public relations officials, but the latter category of organizational employees is also likely to play an important role in perception management following recalls in ways that could present opportunities for future research.

The audiences of organizations make up another important component of the perception management framework. These audiences include any of the organization's stakeholders, from those external to the firm (e.g.: media, regulatory agencies, customers, and the general public) to those internal (e.g.: employees and shareholders). Though some audiences are attuned to the routine actions of firms and their spokespersons (e.g.: Fombrun and Shanley, 1990; Turban and Greening, 1997), audience perceptions are particularly important in the midst of highly positive (Rindova, Williamson, Petkova, and Sever, 2005) or negative events (Desai, 2011; Marcus and Goodman, 1991), as in the case for product recalls. Specific to product recalls, customers, both current and potential, are likely those for whom recalls are most salient, as it is their safety that is directly threatened more than other audiences, which is why I chose customers as the focal audience for my study. That said, other audiences, such as shareholders (Jarrell and Peltzman, 1985) or the media (Zavyalova *et al.*, 2012), are likely to respond to recall events, representing a multitude of important audience-related outcomes to the recall process that continue to merit attention from researchers in various disciplines.

Finally, and most relevant to my study, the organizational perception management framework describes the actions taken by firms specifically intended to manage audience

perceptions. In light of their specific purpose, Elsbach (2003) terms these as "symbolic actions" despite admitting that it is often difficult to differentiate between the symbolic and more practical intentions and outcomes of such actions. Nevertheless, there is strong indication in the literature that firms specifically act in ways intended to manage perceptions rather than solely for improved strategic outcomes (e.g.: Graffin, Carpenter, and Boivie, 2011; Graffin, Haleblian, and Kiley, 2015). As a result, much of the organizational perception management literature is dedicated to explaining how firms' actions, particularly their verbal communications, affect audience perceptions through emotional and psychological mechanisms rather than purely economic and strategic rationale.

Elsbach's (2003) framework outlines a variety of actions that the firm can adopt in order to manage perceptions, including symbolic behaviors, categorizations, and accounts. Symbolic behaviors encapsulate a broad set of actions in which the firm attempts to establish or reinforce an image or identity that it would like to portray. For example, firms undertaking an initial public offering may seek out prominent affiliations or underwriters in order to signal their legitimacy to potential investors (Higgins and Gulati, 2006). In other cases, organizations will design their buyer-supplier contracts to include language that indicate their trustworthiness to partners (Weber, Mayer, and Macher, 2011). Organizations will similarly attempt to portray trustworthiness and strengthen employees' identity with the firm through a variety of human resource practices, including mentoring systems and performance appraisals designed for personal development (Collins and Smith, 2006). These types of behaviors may not always result in positive outcomes, however; an example of this is when managers escalate their commitment to unsuccessful strategies in an attempt to justify their initial decisions and remedy their organization's image of correctness and consistency (Brockner, 1992; Sleesman, Conlon,

McNamara, and Miles, 2012). Organizations may similarly attempt to categorize themselves into favorable social categories (or distance themselves from unfavorable ones) to benefit their identity, particularly to internal audiences. For example, business schools whose Business Week rankings of top B-schools did not match expectations often describe themselves in alternative social categories, such as for its innovation or regional dominance, serving as a response for organizational members to a perceived identity threat (Elsbach and Kramer, 1996). These and other types of symbolic behaviors and categorizations are undoubtedly an important component of the perception management of a variety of organizational circumstances, including product recalls, likely making them appropriate for future research questions.

But of all the symbolic actions taken by firms, none have received more scholarly attention than accounts (Elsbach, 2003: 307), particularly as these accounts are primarily used to manage external audience perceptions of specific events, making them an ideal focus for my study of product recalls. Further, this research predominantly focuses on accounts following negative events (Elsbach and Kramer, 1996), with few notable exceptions assessing those following positive events (e.g.: Bettman and Weitz, 1983; Fiss and Zajac, 2006; Ramchander, Schwebach, and Staking, 2012; Salanick and Meindl, 1984). Research on firm accounts following negative events has been particularly focused on the form of the account or, more specifically, the actual content of the account. The content of firm accounts in their interactions with audiences may communicate the firm's courteousness (Liao, 2007), intimidation (Gundlach, Douglas, and Martinko, 2003), sincerity (Pfarrer *et al.*, 2008), or ethics (Trevino, Brown, and Hartman, 2003), among other images. Though such content analysis is likely to yield interesting findings in product recall settings, I focus my study on the forms of accounts that firms adopt in response to their recalls.

Traditionally, research has considered there to be four primary forms of accounts individuals can adopt following negative events – apologies, denials, excuses, and justifications (Schonbach, 1980; Scott and Lyman, 1968). At the organizational level, however, much of the research has classified accounts as either accommodative or defensive (e.g.: Elsbach, 1994; Marcus and Goodman, 1991) or considered those two classifications along a continuum (Bundy and Pfarrer, 2015). Generally, this classification scheme encapsulates and distinguishes between apologies and denials, which overlaps nicely with much of the individual-level work on trust repair that also tends to focus on apologies and denials (e.g.: Kim, Cooper, Dirks, and Ferrin, 2013; Kim et al., 2004; 2006). However, as a result, the vast majority of this research either ignores justifications and excuses or examines such accounts in isolation from apologies and denials (e.g.: Shapiro, 1991; Staw, McKechnie, and Puffer, 1983; Weiner, Amirkhan, Folkes, and Verette, 1987). Of the few examples of research that has considered justifications and excuses along with the more commonly-studied apologies and denials, most are theoretical (e.g.: Coombs, 2007; Gundlach et al., 2003; Tomlinson and Mayer, 2009) or at the individual level (e.g.: Conlon and Murray, 1996), leaving us with largely untested assessments of the outcomes of these accounts, especially at the firm level.

One final important point regarding organizational perception management research on the firm's actions and communications following negative events is that it overlaps substantially and is often synonymous with research on crisis management. Though a "negative" event is not necessarily a "crisis" (a distinction I will discuss in more detail later), the two bodies of work share much of the same terminology and social psychological theory owing to their similarities in practice. That said, the distinction between negative events and crises is likely to be important when studying a phenomenon such as product recalls, as recalls may all reasonably be

considered negative events, but not all of them are likely to constitute crises. Thus, the study of recalls may benefit from a careful consideration of this distinction and a broad conceptualization of the event that the organizational perception management framework provides in contrast to crisis management. Still, it is important to consider the literature on crisis management and the theory and findings likely to be relevant to a study of product recalls.

Crisis Management

As is the case in many literatures, the crisis management literature has utilized a number of different definitions of the term "crisis". Coombs (2010: 18-19) considers many of these definitions and, from them, defines crisis as "the perception of an unpredictable event that threatens important expectancies of stakeholders and can seriously impact an organization's performance and generate negative outcomes." Further, Coombs (2010: 19-20) offers many clarifications to the term crisis, including the importance of stakeholder perception to "co-create" a crisis, and the inclusion of negative outcomes to stakeholders rather than simply the firm as part of the criteria for meeting a crisis. Perhaps most relevant to a study of product recalls, Coombs also takes great care to distinguish crises from incidents (Coombs, 2004), indicating that while some recalls may indeed become crises for firms, not all recalls are likely to reach that status. In addition to defining crisis, Coombs (2010: 20) also provides a definition of crisis management as "a set of factors designed to combat crises and to lessen the actual damages inflicted" and asserts communication as the critical component of crisis management.

Crisis management is commonly conceived of as a three-stage process consisting of precrisis (prevention and preparation), crisis (event response), and post-crisis (learning) stages (Coombs, 2007). Though there are examples of research that address the pre- (Heath and

Palenchar, 2000; Wan and Pfau, 2004) and post-crisis (Elliott, 2009; Elliott and Smith, 2006) stages of crisis management, the predominance of communication in crisis management research resides in the second stage, wherein firms or important individuals respond to events both for internal or external audiences (Coombs, 2010). This line of inquiry seeks to identify the effects of crisis communication responses on image repair and renewal (Benoit and Czerwinski, 1997; Ulmer, 2001) or management of audience attributions for the event (Coombs, 1995; 2007; Schwarz, 2008). Among the most influential models of crisis communication is Coombs' (2007) Situational Crisis Communication Theory (SCCT) in which key facets of a crisis influence how stakeholders are likely to respond to the crisis event and firms' communication regarding the crisis. Perhaps the most important development of SCCT is the assertion that firms must tailor their own communications to the particulars of their current situation, a notion that has more recently become a central component to any theory-building efforts of this kind at the individual (e.g.: Tomlinson and Mayer, 2009) or organizational (e.g. Bundy and Pfarrer, 2015; Pfarrer *et al.*, 2008) level.

The factors most central to SCCT, and for firms to identify the best communication response to a crisis event, are those that determine the degree to which audiences attribute the cause of the crisis to the firm, an argument borrowed from Attribution Theory (Weiner, 1986). Crisis responses have one or more of three objectives: shape attributions, change perceptions of the organization, and reduce negative affect (Coombs, 2007: 171). The objectives sought by firms and the responses most appropriate to achieve those objectives are highly contingent on the nature of the crisis itself. What this theory accomplishes, then, is a series of guidelines to match the appropriate response strategy to crisis type or attribution (Coombs, 1995). For example, for crises based on rumors, Coombs (2007) recommends that firms commit to denial responses. For

more clearly attributable crises, Coombs argues that firms would be best served to offer apologies, perhaps with the inclusion of compensation for any victims. For less attributable crises (i.e.: accidents), the most appropriate response is dependent upon the firm's history of similar crises. Specifically, firms with no such history should attempt to diminish the crisis itself or make excuses for their involvement, whereas those with a history should instead respond more apologetically. Importantly, SCCT reinforces the notion that there is no "safe" response, as even accommodative responses can prove costly to the firm (Stockmyer, 1996) while remaining unable to yield positive reactions (Coombs and Holladay, 1996), or even earning negative ones (Siomkos and Kurzbard, 1994). However, despite these and other prescriptions to firms mired in crisis, SCCT is limited in a number of ways that are important to my study of product recalls.

Important Gaps in the Crisis Management Literature

Understandably, SCCT focuses on crisis events; however, to build a theory around product recalls, crisis may not be the most appropriate framing. Specifically, though some recalls may constitute a crisis, not all are likely to escalate to the enormity or gravity that is generally required for a crisis. As Coombs (2010) makes clear, negative events are not necessarily crises if they are not "serious" enough, and this distinction is likely true of many examples of product recalls. Thus, a model of responses following recalls needs to consider the degree to which a focal recall actually constitutes a crisis in order to leverage insights from SCCT. Further, the broader organizational perception management framework discusses multiple types of organizational images that are important to the impression management process in addition to simply firm reputation. For example, organizational trustworthiness is likely an important image that firms need to manage in their relationships with customers following product recalls.

However, though SCCT does consider the emotions involved in a stakeholder response to crisis (e.g.: Jin and Cameron, 2007; Jorgensen, 1996; Stockmyer, 1996), the theoretical model only includes organizational reputation, failing to consider other relevant images such as trustworthiness. Lastly, much of SCCT's development has been guided by and is geared towards experimental studies (e.g.: (Coombs 2007); Coombs and Holladay, 1996; Fediuk, Pace, and Botero, 2010; Lee, 2005), whereas actual firm and stakeholder behaviors have largely remained untested by the arguments at the core of SCCT. This is problematic, first and foremost, in that it limits the generalizability of the conclusions drawn in SCCT. It also has practical limitations in that experiments which prompt their respondents with only one response type at a time make them unable to consider firms' employment of multiple responses for their crisis. Finally, experimental designs hold constant the content contained within messages, whereas a study of actual firm responses allows the content within each type of message to vary, improving the internal validity of assessing firm response types.

Important Gaps in the Overall Organizational Perception Management Literature

Further, and more generally, SCCT, the crisis management literature, and the broader organizational perception management framework all share some notable gaps which merit exploration is for further insights regarding the conditional effectiveness of firm responses. For example, most of the research, particularly empirically, on firm accounts following negative events or crises focuses solely on one or two types of accounts rather than all four (Gillespie and Dietz, 2009). Others will instead classify all accounts into two categories (accommodative and defensive) rather than the more nuanced four-type classification scheme offered throughout much of the literature's history (Elsbach, 2003; Schonbach, 1980; Scott and Lyman, 1968;
Szwajkowski, 1992). In addition to this issue, there are very few examples of researchers undertaking larger-scaled quantitative efforts to classify actual firm communications into these account types and connect them to real strategic consequences, an issue that mirrors the overall literature on product recalls as well. Finally, despite the importance of contingent factors related to the attribution of the negative event central to SCCT and much of the crisis management literature, there is little empirical work examining what, in practice, the broader factors are that influence the attributions made by important stakeholders. Specifically, and particularly in the immediate aftermath of the onset of the negative event, stakeholders' attributions are likely to be based on generic heuristics (Folkes, 1988; Kim and Cameron, 2011; Weick, 1988; 1993), meaning there are likely broad factors that determine stakeholders' assessments of firms and attributions regarding their involvement in negative events (Kahneman and Frederick, 2002; Laufer, Gillespie, and Silvera, 2009; Sinaceur, Heath, and Cole, 2005). However, the specific factors from which these attributions are developed have seldom been explicitly explored, especially outside of experimental settings or in a product recall context, and merit additional consideration. In sum, we are left with an incomplete portrait of the conditional effectiveness of firm communication responses following their negative events, particularly product recalls, and I seek to address these gaps with my study of recall-based attributional factors, firm responses following recalls, and customer reactions to the overall recall event.

THEORY AND HYPOTHESES

Organizational Perception Management and Firm Responses to Negative Events

My theory on product recall management and ensuing customer reactions follows a decades-old literature that has examined the importance of public accounts in managing a variety of contexts (Scott and Lyman, 1968), including situations in which firms are under duress. For example, prior research in this area has looked at various corporate crises, including recalls, and found that shareholder wealth varies for situations in which firms are more accommodating to crisis victims compared to when they are defensive (Marcus and Goodman, 1991). Another study examined how firms can actually obtain social legitimacy following illegal actions taken by members of the organization largely through their public accounts (Elsbach and Sutton, 1992). Other researchers have found that firms can preempt a potentially negative event by creating 'strategic noise' or other forms of impression management that create more positive distractions around the time of the event (Elsbach, Sutton, and Principe, 1998; Graffin et al., 2011). However, though firms can benefit from their public accounts surrounding their controversies, research on firms that have filed for bankruptcy has demonstrated that while certain types of accounts may prove beneficial in the firm's relationship with audiences, other public strategies may actually backfire and exacerbate the social issues confronting the firm (Sutton and Callahan, 1987). These and many other examples of research in this literature that have explored the potentially powerful effects of public firm accounts, including in the midst of controversy surrounding the firm, demonstrate the importance for firms to utilize appropriate strategies in their public accounts given their specific situation.

In order to discuss the varying accounts firms can have publicly in regards to their recalls, I draw on the organizational perception management literature for a more comprehensive and systematic examination of the potential types of responses in which firms may engage. The overall organizational perception management framework is quite broad and inclusive to not only the perceptions themselves but the actions taken at the organizational level, the individuals responsible for those actions, and the audiences whose perceptions are valued (Elsbach, 2003). Though in general this framework presents a wide scope of topics for research and theory, my study leverages this framework by focusing in more narrowly on the actions taken by organizations to manage audience perceptions. Specifically, I am concerned with the public communications of firms, termed accounts, which Elsbach describes as the most studied type of organizational perception management tactic (2003: 307), owing to its importance as an organizational tactic. Accounts are defined as any explanation made by an organization designed to influence perceptions of the organization's responsibility for an event (Elsbach 2003), making it a particularly appropriate focus for a study on product recalls. These accounts are likely to be more symbolic than substantive, reflective of an impression management approach (Schlenker, 1980) in an attempt to improve or restore the organization's images of legitimacy (Chen and Meindl, 1991), trustworthiness (Barney and Hansen, 1994) or, more generally, its reputation (Rao, 1994; Staw and Epstein, 2000). Accounts can improve these socially-constructed organizational resources when they either successfully mitigate negative perceptions or enhance positive perceptions following events (Schlenker, 1980), even if those events would otherwise be distinctly negative (Elsbach and Sutton, 1992).

Elsbach's framework discusses the importance of the forms of these accounts, which vary depending on the positive or negative valence of the event, and specifically categorizes four

forms of accounts in response to negative events. These forms – excuses, justifications, denials, and apologies – have received varying degrees of attention throughout the various literatures relevant to my study. For example, many of the primary empirical advances in trust repair research have contrasted apologies and denials and their effectiveness in repairing different types of violations (Kim *et al.*, 2004; 2006; 2013; Tomlinson, Dineen, and Lewicki, 2004). Others have chosen to focus more on justifications and explanations of the negative event (Bies and Shapiro, 1987; Shapiro, 1991; Staw, McKechnie, and Puffer, 1983) or excuses regarding their underlying causes (Bettman and Weitz, 1983; Weiner, Amirkhan, Folkes, and Verette, 1987). That said, in light of the empirical difficulties of doing so, research in organizational perception management or trust repair has seldom sought to integrate these four primary forms of firm accounts into one study (Gillespie and Dietz, 2009).

Thus, I will direct my focus in building theory around each of the four forms of public accounts following negative events. As mentioned, (Elsbach 2003) categorized these accounts into excuses, justifications, denials, and apologies. Loosely, these four accounts can be grouped into more "accommodative" to victims of the negative event by confessing responsibility (justifications and apologies) versus those that are more "defensive" in order to minimize the firm's guilt (excuses and denials) (Elsbach, 1994; 2003; Marcus and Goodman, 1991). However, classifying these accounts in this manner ignores a significant amount of nuance between them and, more importantly, does not allow for a complete depiction of their influences on the causal attributions of the negative event (Schonbach, 1980; Tomlinson and Mayer, 2009). Namely, denials and excuses are similar in that both assert the innocence of the communicating party but differ in their acknowledgment (excuses) or denial (denials) of the actual existence of an issue associated with a given event (Schonbach, 1980; Weiner *et al.*, 1987). Likewise, apologies and

justifications are similar in that both accept responsibility for the event but one (apology) also accepts guilt associated with the event while the other (justification) tries to downplay or avoid any negative judgments associated with their involvement by asserting the legitimacy of their behavior (Conlon and Murray, 1996; Scott and Lyman, 1968; Weiner, Figueroa-Munioz, and Kikihara, 1991). Thus, Szwajkowski (1992) considers these four types of accounts in a 2x2 matrix wherein the two dimensions are "Admits Responsibility" and "Admits Net Harm". Further, in the recall context, there are clear examples of each of these types of accounts that firms may employ. For example, firms making excuses would likely attribute the cause of the recall to an uncontrollable or external cause (e.g.: "the supplier is at fault"). Deniers would do their best to assert that there is no real issue or threat present associated with the recall (e.g.: "no injuries have been reported, and we are simply doing this out of an abundance of caution"). Justifying firms would be more accepting of responsibility but insist that they were correct in their procedures ("we discovered the issue after an extensive update to our industry-leading inspection protocols"). Finally, apologizers would take full responsibility for the recall ("we sincerely apologize to our consumers and are fully committed to regaining your trust"). With this in mind, I proceed in building into my model of recall management and make specific predictions regarding the potential reparative effects of each of these four types of accounts central to the organizational perception management literature.

Contingent Effects of Recall Responses on Customer Reactions

The distinction between communications that accept responsibility or do not is a crucial one for how it is likely to be received by the party to which it is communicated. Specifically, this choice on the part of communicators has important implications for the likelihood that this

communication averts, or perhaps worsens, the potential damage resulting from a negative event (Kim *et al.*, 2004; Lewicki and Bunker, 1996; Schoorman, Mayer, and Davis, 2007; Tomlinson and Mayer, 2009). As Bies (1987: 295) puts it, "a social account...attempts to correct the audience's initial perceptions of the situation", such that it ideally communicates that the particular event is not reflective of the communicator's trustworthiness or reliability moving forward (Krull, 1993; Tomlinson and Mayer, 2009; Weiner, 1985). I argue that this is likely to be particularly true in a context such as product recalls in which customers can generally feel threatened by the firm's products moving forward, a notion that is at least generally reinforced in work on crisis management (e.g.: Billings, Milburn, and Schaalman, 1980; Bundy and Pfarrer, 2015; Coombs, 2007; Fink, 1986; Mitroff, 1988).

The distinction between accepting and denying responsibility for a negative event reflects the conflicting goals sought by communicators of these different types of responses, and importantly, both communication strategies can be received positively or negatively by audiences (Tomlinson and Mayer, 2009). Specifically, there are both costs and benefits associated with the degree to which violators accept responsibility (Kim *et al.*, 2004). Accepting responsibility has obvious costs associated with it in that it confirms the party's guilt associated with the negative event, a confirmation that could prove damaging. However, that same acceptance can be beneficial to the trust repair efforts in that it suggests that the guilty party recognizes the wrong in their actions and intends to avoid such negative events in the future (Bottom, Gibson, Daniels, and Murnighan, 2002; Kim and Yang, 2009; Liao, 2007; Ohbuchi, Kameda, and Agarie, 1989; Tomlinson, Dineen, and Lewicki, 2004). In order to be an effective communication, accounts that accept responsibility need the benefits associated with the "redemption" of their admission to outweigh the costs of confirming their guilt (Kim *et al.*,

2004). However, if the reverse is true, then these accounts can actually further damage their relationship with relevant audiences.

On the other hand, accounts that attempt to deny responsibility for the violation have inverted costs and benefits. Such accounts can benefit the firm's attempts to avoid the potential damage associated with a negative event in that they can enhance the likelihood that their audience believes in their innocence, or at least begins to doubt their guilt, in regards to the event (Coombs and Holladay, 2004; Rhee and Valdez, 2009; Riordan, Marlin, and Kellogg, 1983; Sigal, Hsu, Foodim, and Betman, 1988). However, these benefits can be offset by the costs associated with signaling unlikely redemption or refusing to accept that behaviors or procedures need to change (Kim *et al.*, 2004; 2006; Pfarrer *et al.*, 2008). Again, much like for accounts that accept responsibility, these more defensive accounts can only effectively avoid damaging their relationship with the offended audience if they convincingly establish innocence in the focal violation more than they create further doubts about the likelihood of behavioral changes moving forward. Further, if the potential negative effects of these accounts outweigh the potential benefits, the account could add to the damage created by the negative event.

Importantly, however, when considering the four types of firm accounts is that these accounts can be classified according to two dimensions. Thus, in addition to the "admits responsibility" dimension, there is an "admits net harm" dimension that is important to consider as well (Szwajkowski, 1992). When solely considering firm crises, as is often the case in the literature, this distinction is likely less important, as by definition, a crisis requires the potential for harm to stakeholders (Coombs, 2010). However, for product recalls, in which the potential harm to customers ranges from minimal to fatal, firms can communicate their acknowledgement or denial of net harm to customers, which can have important implications for customer

reactions. Specifically, in light of the importance of communications "matching" stakeholder expectations in crisis and impression management theory (Bundy and Pfarrer, 2015; Coombs, 2007), I argue that firms' admission or denial of net harm to customers is another important consideration for the effectiveness or ineffectiveness of firm accounts following product recalls. Accounts that fail to match customers' assessment of the threat presented to them in a given recall can create doubt regarding how the firm values them and cause customers to reassess their relationship with the firm moving forward (Dutton and Dukerich, 1991; Sitkin and Roth, 1993). Thus, I argue that, rather than simply the accommodative-defensive dimension of firm accounts, considering each of the four different types of firm accounts will have different implications for the likelihood that customers will react more or less favorably to the recall event.

On a final important note, I do not make main effect predictions regarding the effectiveness of the firm accounts on customer reactions. I do not expect any of the four account types to be necessarily positive or negative for firms across the board or on average. This broad argument reflects a substantial amount of equivocal theory and studies detailing the effects of accounts on important restorative efforts following negative events (Bundy and Pfarrer, 2015; Coombs, 2007; Kim *et al.*, 2004; 2006; Mishina, Block, and Mannor, 2012; Tomlinson and Mayer, 2009). Rather, there are many different mechanisms through which relationships can be sustained or restored following negative events (Dirks, Lewicki, and Zaheer, 2009; McCarter and Caza, 2010), but the particular mechanism that is likely to be more or less effective for the firm to tap into is likely to depend substantially on the nature of the event itself. Thus, the theory and hypotheses that I develop are contingency-based, such that I consider the four types of firm accounts in conjunction with important recall characteristics that underlie how customers are likely to assess and react to a particular recall event and the firm's communication response.

Interactive Effects of Recall Characteristics and Recalling Firm Responses

In two literatures that are most closely related to my study of product recalls (trust and crisis management), the predominance of research has asserted the notion that rather than there being "one size fits all" responses that earn better reactions across the board, best practices are highly contingent on the nature of the negative event itself. One of the most influential theories in the crisis management literature, SCCT, situates crisis management responses into a particular context in order to determine best practices for firms in the midst of a crisis (Coombs, 1995; 2007). Other crisis management researchers have furthered the importance of this idea, arguing firm responses to crises need to "match" stakeholders' expectations of what an appropriate response should be given the situational attributions of the event (Bundy and Pfarrer, 2015). Further, firms that choose more appropriate responses following negative events can more effectively preserve their reputation in the minds of their various stakeholders (Mishina, Block, and Mannor, 2012).

Similarly, research in trust and trust repair has advanced a parallel argument that trust repair efforts are more or less successful depending on the particular trust violation event (e.g.: Kim, Dirks, and Cooper, 2009; Tomlinson and Mayer, 2009). In fact, much of the recent empirical research on trust repair has emphasized the importance of situating different trust repair efforts within different trust violation contexts, as the relative success or failure of the repair efforts are likely to vary considerably. The work of Peter Kim and colleagues has largely spearheaded this line of inquiry in recent years, beginning with two studies that both indicate trust violators are better off apologizing or denying dependent on the nature of the violation (Kim *et al.*, 2004; 2006). These same coauthors couple that study with another that finds that violators who refuse to confirm or disconfirm allegations against them are largely unable to

repair trust for multiple types of violations, as doing so provides no information and fails to shape beliefs about the violation in any meaningful way (Ferrin, Kim, Cooper, and Dirks, 2007). On the other hand, more substantive trust repair efforts can be beneficial, particularly following competence-based violations, but much less so following integrity-based violations (Dirks, Kim, Ferrin, and Cooper, 2011). In this vein, and more specific to my context, Liao (2007) finds that employee efforts to restore customer perceptions of justice following service failures are more effective for less severe and more infrequent failures. In this light, I build my theory by situating the four types of firm accounts following negative events in the context of specific recall characteristics, such that these accounts' success or failure in managing customer reactions is contingent on important recall conditions.

In developing theory regarding the interactive effects of firm responses to recalls and important recall characteristics, I consider characteristics that I argue are likely to influence a) the degree to which the focal recall represents a crisis and b) the degree to which customers are likely to direct blame for the recall to the recalling firm. These characteristics include the magnitude of the event itself (recall severity), as well as important firm-level variables that provide context for the focal recall, including the focal firm's recall history, recent recall activity of competing firms, and the firms involved in the focal recall. I argue that recall severity and frequency of similar product recalls provide an indication of the degree to which the focal firm's recall history and the involvement of other entities in the focal recall influence the degree to which customers will blame the recalling firm for the recall. I develop these arguments, including why these characteristics play these important underlying theoretical roles in recalls, as well as the appropriate and inappropriate responses firms can make following recalls displaying

these characteristics. Hypotheses 1 and 2 discuss the characteristics that indicate the degree to which the focal recall represents a crisis, and Hypotheses 3 and 4 discuss the characteristics related to customer attributions.

Figure 1 – Overall Model



Recall Characteristics Representing Crisis Dimensions

In a recent comprehensive handbook on crisis management research, Coombs (2010: 19) defines a crisis as "the perception of an unpredictable event that threatens important expectancies of stakeholders and can seriously impact an organization's performance and generate negative outcomes." Coombs came to this definition of a crisis after considering and combining ideas from many prior definitions utilized in the literature, capturing something of a consensus among crisis management researchers. Coombs continues on to discuss what he considers to be the most critical elements of this definition. First, this definition makes clear that threatening substantial harm to stakeholders is the most significant negative outcome that can result from a crisis (Coombs, 1999; Mitroff and Anagnos, 2001). Thus, a crisis should only be considered as such if stakeholders are seriously threatened in some way. Second, a crisis is the result of unusual circumstance and is thus unpredictable and unexpected, especially by stakeholders (Barton, 2001; Seeger, Sellnow, and Ulmer, 1998). These elements of a crisis are important to consider in a study of product recalls because, based on this definition, each recall is unlikely to be a crisis and, therefore, not likely to be subject to the conclusions drawn from the crisis management literature. Instead, recalls need to be considered to the degree to which they actually represent a crisis in order to study the most appropriate firm responses.

Reflecting these important dimensions of crises, I consider the severity of the recall and the frequency of similar recalls. Recall severity indicates the potential harm that can befall the stakeholders of interesting in my study (customers), providing a clearer understanding of the most negative outcome that can result from the recall, according to Coombs' definition. The frequency of similar recalls reflects the unexpectedness of the focal recall, as recalls of products in categories that are more frequently recalled are much more predictable to customers than are

product in categories with comparatively less recall activity. Generally speaking, the crisis management literature has rarely studied the degree to which their focal events actually constitute a crisis, instead choosing study designs in which observations are simply crises. Thus, my study of product recalls and important recall characteristics reflecting the degree to which each recall represents a crisis studies a rarely-examined element of the crisis management process.

Recall severity. In general, recalls that are more severe are more likely to resonate with customers in light of the direct threat posed to them with the use of the product being recalled. The severity of the recall event, representing the potential harm to consumers who use the recalled product, also makes it more likely that customers will perceive a substantial incongruence with the firm in ways that will make them reconsider their relationship with the firm and its products moving forward (Devers, Dewett, Mishina & Belsito 2009). As a result, firms need to match the expectations of their customers in their responses to especially severe recalls in order to avoid an assessment from customers that the firm "doesn't think like us" (Sitkin and Roth, 1993). Thus, I argue that for especially severe recalls, firms need to communicate in their responses an admission of net harm to the customers as a result of the recall rather than attempting to downplay or deny the potential negative consequences. The response types that "admit net harm" (i.e., apologies and excuses) acknowledge the threat presented to customers and would thus be best suited to match their expectations, which is crucial to avoiding distrust and strain to the relationship (Lewicki, McAllister, and Bies, 1998). Other response types that refuse to admit net harm, however, attempt to downplay the potential harm to customers (justifications) or refuse to acknowledge their existence (denials), which are

more likely to further damage the firm's relationship with customers following more severe recalls.

Recalls that are less severe, however, require a different response strategy from firms. Less severe recalls are much less likely to resonate strongly with customers, presenting an opportunity for firms to avoid a substantially negative reaction. However, firm responses are still important in these circumstances, as the firm wants to cue customers to assess how limited the impact is likely to be for their product use. Thus, apologies and excuses that intend to "admit net harm" are more likely to constitute an overreaction from the firm, as a recall event with comparatively less potential for harm to customers is presented as harmful. Firms cue their customers to identify harm or wrongdoing where they otherwise had little need to feel so threatened and, perhaps more importantly, miss the opportunity to deflect a negative stigma associated with an event that was unlikely to resonate strongly with customers. Instead, firms, following less severe recalls, would be best off communicating justifications or denials in order to garner better customer reactions, as these response types are more likely to match the customers' outlook towards the recall. Namely, a deflection of net harm is more likely to confirm customers' assessments that they are unlikely to be substantially harmed by the recall and should not react strongly.

In addition to these general predicted effects, I also predict that one particular response type (justifications) will have a particularly extreme effect on customer reactions relative to the other response types. I argue that this occurs because justifications, in effect, are attempts of the firm to downplay the focal event (Tomlinson and Mayer, 2009), which is likely to be particularly inappropriate for recalls of products with potentially severe consequences for customers. On the other hand, justifying a less severe event is likely to conform more strongly with customers'

assessment of the recall than any other response type. Altogether, I predict that firm responses moderate the effect of the important recall severity characteristic on customer reactions such that:

Hypothesis 1: Firm recall responses moderate the relationship between recall severity and customer reactions (sales) such that:

- a) Apologies attenuate the negative effect of recall severity on sales.
- *b)* Justifications exacerbate the negative effect of recall severity on sales.
- c) Excuses attenuate the negative effect of recall severity on sales.
- *d)* Denials exacerbate the negative effect of recall severity on sales.
- *e)* The moderating effect of justifications will be more extreme than that of denials.



Figure 2 – Proposed Interactions with Recall Severity

Frequency of similar recalls. The frequency of similar recalls represents the frequency with which a particular type of product is recalled across all firms. Similar to more severe recalls, recalls of product types that are less frequently recalled more dramatically defy customer expectations, which are otherwise accustomed to products that do not threaten harm. With these defied expectations, many of the same issues arise for the firm as they do with more severe recalls. The mismatch between customer expectations and the less predictable product recall creates an issue that threatens the relationship between the firm and its customers. Namely, it is this incongruence of expectations that presents a threat to customers (Dutton and Dukerich, 1991) and causes them to reconsider their relationship with the firm and, in this context, the use of its products (Sitkin and Roth, 1993). Firms need to communicate an understanding of this missed expectation by, similar to more severe recalls, admitting the net harm of the focal recall.

Again, they can best accomplish this through apologies and excuses, both of which implicitly or directly acknowledge the unexpected nature of the particular defiance of expectations. Justifications and denials, however, fail to "admit net harm", instead refusing to acknowledge the mismatch between customer expectations and product safety outcomes in their attempts to downplay or deflect blame for the incident. For recalls of less frequently recalled product types, such a response fails to respect the customers' outlook that a significant event has occurred. That said, for recalls of product types that are more frequently recalled, customers have become more accustomed to recalls of these products and are likely to assess the recall as particularly harmful. Thus, justifications and denials can represent a more appropriate response from firms for these recalls, as these responses more closely match the customers' mindset that net harm has not occurred. On the other hand, apologies and excuses communicate a level of unexpectedness and contrition from firms, representing a mismatch between those accounts and

customers' assessment of the recall as a regular and expected event. In these cases, apologies and excuses are likely to engender more negative reactions.

For more rare recalls, I argue that excuses will be particularly effective for firms to employ, largely because excuses, especially considering how they are manifested in product recall press releases, specifically communicate the "irregularity and infrequency" of these types of events (Scott and Lyman, 1968: 47). Thus, excuses, more than other account types, match the expectations of customers who are also likely to assess the recall as an irregular event given the rarity of similar recalls. On the other hand, making excuses for more frequent types of recalls is likely to depart substantially from customer expectations, in that communicating an event to be irregular when customers can see them as very regular represents a mismatch. I argue that this mismatch will garner especially negative reactions from customers. Thus, I predict that the relationship between the frequency of similar product recalls and customer reactions will be moderated by the firm's response in the following ways:

Hypothesis 2: Firm recall responses moderate the relationship between the frequency of similar recalls and customer reactions (sales) such that:

- a) Apologies attenuate the positive effect of the frequency of similar recalls on sales.
- *b)* Justifications exacerbate the positive effect of the frequency of similar recalls on sales.
- *c) Excuses attenuate the positive effect of the frequency of similar recalls on sales.*
- *d)* Denials exacerbate the positive effect of the frequency of similar recalls on sales.
- *e) The moderating effect of excuses will be more extreme than that of apologies.*



Figure 3 – Proposed Interactions with Similar Recall Frequency

Recall Dimensions Representing Attribution Dimensions

In addition to importance of the degree to which a particular product recall represents a crisis along the dimensions discussed above, I also consider characteristics that are likely to determine the degree to which customers attribute the cause of the recall to the recalling firm. Attributions are important determinations that individuals make regarding the cause for a particular event and are especially influential in research on motivation (e.g.: Weiner, 1985), trust (e.g.: Tomlinson and Mayer, 2009) and crisis management (e.g.: Coombs, 2007). I argue that attributions are likely to play an important role in customers' assessments of recalls as well, particularly in influencing their likelihood of using the recalling firm's products again in the future.

According to causal attribution theory (Weiner, 1986), the important dimensions along which parties can evaluate whether another party is responsible for a given action include the degree to which the event occurred under that party's control and the degree to which it represents stable behaviors. Tomlinson and Mayer (2009: 88) describe the factors that affect these attributions specifically, including the locus of causality, controllability, and stability factors that I argue are important to the recall process. These authors describe locus of causality as the extent to which the event is determined to be caused by factors external versus internal to the party being evaluated. Controllability is the degree of "volitional control" an entity has over a certain outcome or event. Stability is the degree to which the cause of the event is the result of consistent behaviors and actions and likely to remain constant or fluctuate in the future. In general, I argue that for recalls characterized by factors that suggest the recall could not be controlled by the recalling firm or is unlikely to happen again, the recalling firm may be able to avoid substantial blame for the event and earn more favorable (or, at least, less negative)

reactions from customers so long as they properly cue customers to assess these characteristics through their communications (Weiner *et al.*, 1987). On the other hand, firms that inappropriately respond to recalls featuring these characteristics are likely to garner more negative reactions from customers. To reflect these dimensions of attributions, I utilize two characteristics of product recalls that I argue are likely to influence customers' overall attributions of the cause of the recall and their relationship with the recalling firm moving forward.

Firm recall history. The first characteristic I discuss is the recalling firm's prior history of product recalls, which most closely represents the stability dimension of customer attributions of the focal recall. The firm's recall history is the propensity of the firm to recall its products and has important implications for the attributions that onlookers can make regarding the focal recall. The firm's history of committing a certain negative event taps into the stability dimension of attributions (Weiner, 1986), which affects stakeholders' assessment that the firm will be able to prevent such events moving forward (Tomlinson and Mayer, 2009). Prior research has argued that negative events from entities with histories of similar events prompt stakeholders to situate the focal event in that history (Martinko, Douglas, Ford, and Gundlach, 2004), such that they are more likely to view the event as reflective of underlying, unaddressed issues (Coombs, 2007). Though this prior theory is typically developed at the individual level or in more generic crisis scenarios, I argue that this is likely true of customers' assessments of firms' product recalls as well. Specifically, following an important event such as a product recall, customers are prompted to associate the focal recall with the firm's history, cuing them to attribute the focal recall to stable causes and assess an increased likelihood of recalls of the firm's products in the future.

As a result, firms responding to their recalls need to consider their own history of recalls such that they can appropriately modify the stability attribution made by customers in light of that history. Importantly, firms must modify the stability dimension of attributions and indicate that similar events are unlikely to occur in the future (Carroll, 1978; Folkes, 1984). In general, I argue that firms with more extensive recall histories that "admit net harm" (i.e., apologies and excuses) are better equipped to modify the stability attribution (Tomlinson and Mayer, 2009), in that they communicate an acknowledgment of the negative event and, implicitly or explicitly, offer promise of change in the future. These two types of responses do so, as apologies communicate intent to prevent similar failures, whereas excuses indicate that a temporary cause underlies the negative event. Thus, firms apologizing or making an excuse communicate assurances that a similar failure is unlikely to occur again in the future, either through purposeful changes or better circumstance.

However, I argue that apologies and excuses will only effectively shift customer attributions of the recall to unstable causes if the firm has a more extensive history of other product recalls. Recalls made by firms with less extensive recall histories, on the other hand, are less likely to cue customers to assess the fault of the recall to stable causes. Thus, attempts to modify the stability attribution through apologies or excuses will be less effective and may, in fact, accept blame along the stability dimension that customers may otherwise not have attributed. Instead, justifications and denials try to convince customers that changes do not actually need to occur, as the focal recall was largely a non-issue or actually justifies the firm's processes and operations. These accounts are, thus, likely to garner better reactions to recalls of products made by firms with less extensive recall histories. This contrasts the relative

ineffectiveness of justifications and denials of recalls made by firms with more extensive histories, as they fail to modify the stability dimension of attributions.

Additionally, I argue that apologies will garner particularly extreme reactions from customers, both positively and negatively. Specifically, firms that apologize are most specifically intending to change the stability dimension of customer attributions (Gold and Weiner, 2000; Tomlinson and Mayer, 2009) in that they provide an indication of their intention to prevent this from happening in the future. Thus, for firms with more extensive recall histories, apologizing most closely speaks to the attribution dimension that customers need to revise and will be particularly effective in earning better customer reactions. However, for firms with a less extensive recall history, the attempt of an apology to alter customer perceptions of stability will be largely unsuccessful and may actually represent a mismatch of customer expectations that results in larger penalties. Altogether, I predict that firm responses present an important moderating condition to the relationship between the firm's recall history and customer reactions in the following ways:

Hypothesis 3: Firm recall responses moderate the relationship between firm recall history and customer reactions (sales) such that:

- *a)* Apologies attenuate the negative effect of firm recall history on sales.
- b) Justifications exacerbate the negative effect of firm recall history on sales.
- c) Excuses attenuate the negative effect of firm recall history on sales.
- *d)* Denials exacerbate the negative effect of firm recall history on sales.
- *e)* The moderating effect of apologies is more extreme than that of excuses.



Figure 4 – Proposed Interactions with Firm Recall History

Involvement of other entities in recalls. Unlike the firm's recall history, which has important implications for the stability dimension of attributions, the involvement of other entities, or the connection of entities other than the corporate parent to the underlying causes of the recall, that potentially allow customers to externalize the cause of the recall reflects the locus of causality and controllability dimensions of attributions (Weiner, 1986). If customers externalize the cause of the recall away from the recalling firm or shift the blame to more uncontrollable causes, then their assessments of their relationship with the firm moving forward is more likely to be unharmed (Miller and Ross, 1975; Rotter, 1966), allowing them to continue to trust that the firm will provide safe products in the future. Without being able to do so, customers are more likely to reassess their trust in the firm's products (Mayer, Davis, and Schoorman, 1995) and, thus, their use of such products moving forward (Kim, Ferrin, and Rao, 2008). In light of the importance of locus of causality and controllability to customer attributions following recalls, firms also need to consider whether or not other entities were involved in the recall when formulating their responses. Specifically, recalling firms can cue customers to external or uncontrollable causes in their communication efforts (Coombs, 2007; Coombs and Holladay, 2002), but these efforts are likely to be more or less effective depending on the visible involvement of other entities.

For my purposes, the involvement of other entities includes outside firms, such as suppliers or distributors, which can be specifically cited in disclosures of the product recall from the relevant regulatory body. The inclusion of these outside firms in descriptions of the recall provides an external cause to which customers can plausibly shift blame for the product recall. The involvement of outside firms is likely to be most relevant to the locus of causality dimension of attributions, for which customers determine the cause to be from entities external to the

recalling firm. In addition to outside firms, I also argue that certain internal entities can still effectively shift the controllability attribution such that customers determine the recall to have emerged from uncontrollable causes. For example, the specific products being recalled by the parent firm are often the responsibility of a subsidiary or, more simply, have a different brand name from that of the corporate parent. Though more subtle than the involvement of external entities and still very much under the responsibility of the corporate parent, such recalls can shift the focus from the parent to that of a particular brand name or subsidiary that differs from the name of the parent firm. The net result, if the firm communicates appropriately following the recall, is that customers may not penalize the parent firm and cease purchasing their products if they determine the recall to be more associated with the subsidiary rather than under the control of the parent. Similarly, I argue that customers will not penalize the firm if they can attribute the cause of the recall to an external locus, so long as the firm cues customers to make such an attribution through its own response.

Following recalls in which other entities were involved, I argue that firm responses that attempt to deflect responsibility (i.e., excuses and denials) are more likely to be successful than those that accept responsibility (i.e., apologies and justifications) precisely because of how they cue customers to assess the recall. Specifically, denials and excuses, in their refusal to accept responsibility cause customers to assess external or uncontrollable causes to the recall that they may otherwise not utilize in their attributions. Such cues are likely to be more successful when customers have a plausible alternative to which they can attribute the recall. On the other hand, when no such visible alternative exists for customers, firm attempts to deny or make excuses are more likely to backfire, as these efforts are less likely to be successful in allowing the firm to avoid blame while also failing to communicate to customers that they are more likely to prevent

recalls in the future. Under these circumstances, apologies and justifications are more likely to be successful because they communicate this message better, which is especially important with no external or uncontrollable causes to which customers can turn. When alternative entities were involved, however, apologies and justifications miss their best opportunity to shift customer attributions in failing to cue customers to assess the involvement of these alternative entities.

Finally, I argue that excuses, in their attempts to shift the attributions of an event to sources that are less central to the excuse-giver (Snyder and Higgins, 1988) most directly address the external or uncontrollable causes to which firms would like customers to attribute the recall. Thus, when alternative entities are visibly involved in a recall, firms that deliver excuses in their communications to stakeholders will be particularly effective in earning better customer reactions. However, when no such entity is visibly involved, these attempts to blame external or uncontrollable causes will be assessed more harshly, as customers without information confirming such causes will be more skeptical of such accounts and more likely to penalize the excuse-giving firm. Thus, I predict the effect of the involvement of alternative entities on customer reactions will be moderated by the firm's response in the following ways:

Hypothesis 4: Firm recall responses moderate the relationship between the involvement of other entities and customer reactions (sales) such that:

- a) Apologies attenuate the positive effect of the involvement of other entities and sales.
- *b)* Justifications attenuate the positive effect of the involvement of other entities and sales.
- *c) Excuses exacerbate the positive effect of the involvement of other entities and sales.*
- *d)* Denials exacerbate the positive effect of the involvement of other entities and sales.
- e) The moderating effect of excuses is more extreme than that of denials.



Figure 5 – Proposed Interactions with Involvement of Other Entities

METHODS

Companies recall their products when it is revealed that there are safety issues or other defects as a means of protecting the consuming public. In the United States, the recall process, and more generally the safety of products sold, is regulated by a variety of government agencies. The different agencies oversee products from industries that most directly relate to their purview. For example, the National Highway Travel Safety Administration (NHTSA) oversees the product safety of automobile manufacturers. The United States Coast Guard (USCG) has jurisdiction over the recall of recreational boats and other related boating equipment. In total, there are seven United States government agencies that have oversight over product safety and recalls of various industries, including the NHTSA, USCG, Consumer Product Safety Commission (CPSC), Environmental Protection Agency (EPA), Federal Aviation Administration (FAA), Food and Drug Administration (FDA), and the United States Department of Agriculture (USDA).

Each of these agencies is tasked with ensuring the safety of products on behalf of the general public by conducting independent research and inspection of company products and facilities, enforcing recalls against companies whose products have been found to be unsafe and overseeing their successful completion, and informing the public about any specific dangers associated with the products they regulate. In light of the latter responsibility, these seven agencies release press announcements upon the initiation of every recall they oversee and make other relevant information pertaining to these recalls available to the public. With this provision of information, historical and specific recall-level data can be obtained by members of the general public, often through the specific agency's website.

Historically speaking, the recall activity overseen by a few of the agencies has been relatively infrequent, including that of the EPA, FAA, and USCG. Others, including the NHTSA and USDA, are narrowly focused on very few industries, and thus few companies. The CPSC and FDA, on the other hand, regulate a wide range of industries and products and have overseen a large number of recalls. The FDA, in particular, releases and makes available their description of the recall as well as relevant data regarding the recall, including the size, scope, class, and reason behind the recall. In light of its many benefits relative to many of the other agencies' data, the FDA recall data provides the best opportunity to examine the influence of various recall characteristics on important strategic outcomes.

According to its website, the FDA regulates the safety and recalls of the following product categories: animal drugs, animal feed, blood products, cosmetics, human drugs, food (excepting meats, poultry, and eggs), medical devices, radiation-emitting products, transplantable human tissue, and vaccines. The FDA's oversight spans to a wide cross-section of industries, ranging from food manufacturing (SIC 2-digit code 20) to wholesale non-durable goods (51) to health services (80). The recalls from this wide range of industries are also quite varied in terms of their threat to public safety, ranging from grave health consequences, including death, to more benign instances of mislabeling or packaging. Generally speaking, the breadth and diversity of recalls regulated by the FDA provides substantial variance in terms of many of the focal variables theorized as well as more generalizable tests of the hypotheses.

Sample

FDA data regarding the recalls under its jurisdiction is publicly available dating back to the beginning of 2004. For my sample, I use recalls that were initiated between January 1, 2006

and December 31, 2013. I began my sample in 2006 rather than 2004 because doing so allowed me to compute the variables pertaining to firm and industry recall histories, as such data will have accumulated in the information made available by the FDA. I ended my sample at year-end 2013, as the outcome variables require up to a full year following the quarter in which the recall occurred, making recalls from 2014 or 2015 unable to be used in the tests of my hypotheses. The outcome data, as well as a number of control variables, was obtained from Compustat, which compiles financial and performance data of publicly-held companies.

In order to capture the firm's accounts in response to their recall event, I obtained press releases made by the company as their initial announcement of a particular recall event from Factiva and Lexis Nexis. These press releases were collected and analyzed for their content to determine the type of firm responses that these communications represent. In total, I collected 686 press releases; after removing press releases of firms (mostly grocery stores) discussing other companies' recalls, as well as press releases of firms for which there was no accompanying Compustat or FDA data, I was left with 270 press releases representing 226 firm-quarters to comprise my final sample. The press releases in this final sample were made by firms which averaged \$24 billion in sales in the year following their recalls, ranging from \$12 million to nearly \$100 billion. My final sample only includes observations for which press releases from the firm and complete Compustat data for the outcome variables of my study were able to be obtained, and analyses were conducted at the event-level of analysis.

Dependent Variables

Customer reactions following recall. For my dependent variable, I am focusing on customer reactions, as the potential safety issues revealed by a product recall most centrally

affect customers. Following a recall event, customers may feel a violation of their expectation for safe product consumption, and knowing that the company has made available products with some level of safety concerns, they may subsequently assess whether or not they should remain consumers of the company's products moving forward. Thus, unlike shareholder reactions, media coverage, or other types of stakeholder reactions, customers represent the ideal stakeholder group to assess for their reactions following recall events. Specifically, I used firm sales (in \$mil) as my dependent variable, as overall firm sales accumulates the consumption decisions made by customers in general following a given recall event, resulting in a more global dependent variable of interest than is typically seen in related studies at more individual levels, and one that is more clearly connected to economic consequences than experimental or survey designs that are commonly seen in product recall, negative event, or crisis-related studies.

To capture customer reactions, I used the firm's sales in the four quarters following the quarter in which the recall occurs. Using sales rather than revenue, for example, allows me to keep the focus strictly on customer reactions rather than the company's investment gains or other activities that potentially earn the company money outside of the consumption of their products and services. I additionally used sales in only the quarter following the recall's quarter as an alternative dependent variable for robustness or, perhaps, to examine whether the effects may differ over time.

Independent Variables

Firm responses. Firm responses were collected from Factiva using a number of search criteria. First, Factiva's Search Builder function categorizes articles based on the specific content that they cover. Two such categories are relevant for my study: "Product Recalls" and "Press

Releases", both of which were used to filter the search for recall-related press releases. Further, I restricted the search for the time period beginning January 1, 2006 until December 31, 2013. Next, for the sake of filtering out items unrelated to my sample, I restricted the search criteria to exclude the automotive industry as well as the U.S. Consumer Product Safety Commission. Using these search criteria, each of the resulting items returned in Factiva was read and assessed by a trained research assistant, only to be pulled and included in my final sample if the press release was made by the recalling company (as opposed to a regulatory body or other outside party) and pertained to a product in categories overseen by the FDA.

Though much of the prior work categorizing these forms of social accounts has been conducted in experimental settings (Coombs and Holladay, 2008; Kim and Yang, 2009; Shapiro, 1991) or using qualitative methods (Elsbach and Sutton, 1992; Elsbach, Sutton, and Principe, 1998), few researchers have categorized larger cross-sections of actual firm communications for quantitative studies (Elsbach, 1994), including for product recalls (Marcus and Goodman, 1991). In following with these examples, I have utilized trained research assistants to hand-code the firm communications in the aftermath of each recall. I trained each assistant by defining and describing each type of firm response, providing representative examples, detailing their coding procedures, and overseeing multiple rounds of practice sets of press releases.

Each observation in the sample was coded independently by three raters who were blind to the hypotheses with a dummy variable for each of the four account categories (apology, denial, excuse, and justification), with a 1 indicating that the account type was used and 0 indicating that it was not. Importantly, this means that each observation can represent multiple account types. Further, it is often possible and even likely that firms will want to engage in multiple response types in their communication efforts. For example, a firm may want to both

apologize for the incident while still indicating through excuses that extenuating circumstances may have been partially to blame (cf. Conlon and Murray, 1996).

To assess the agreement between the three raters, I calculated reliability indexes for each of the four response types using Perreault and Leigh's (1989) technique for assessing reliability of nominal variables adapted for coding from more than two raters (Rust and Cooil, 1994). The sought-after reliability threshold for each variable is .90 (Rust and Cooil, 1994) with perhaps as low as .70 being acceptable for more exploratory work like this study (Nunnally, 1978). For apologies, the procedural reduction in loss (PRL) approach for interrater agreement, outlined in Rust and Cooil (1994), yielded an agreement of .98, meeting most standards of interrater reliability. Similarly, denials (.95) and excuses (.98) yielded satisfactory interrater agreement as well. Justifications, on the other hand, were most difficult to find agreement between the coders, with an agreement of .82. The distinction between these response types and particularly how a justification is expressed in firm press releases following product recalls is, conceptually and methodologically, relatively new territory explored in this study relative to prior work in this area. Thus, the lower reliability of justifications may well be satisfactory, as it still well exceeds the commonly-held threshold of .70 for exploratory work. Ultimately, for any disagreements between the three independent raters of any of the response types, a fourth trained research assistant, also blind to the hypotheses, then reconciled those disagreements by evaluating the specific response types that are contentious for the focal observation.

For further illustration of each type of firm account and what they make look like in practice in a recall context, the following four examples (one for each account type) are from actual press releases made by firms following their product recalls in my sample:

- *"We deeply regret this incident and are doing everything possible to resolve it quickly so that our consumers can continue to enjoy these products."* (Apology)
- "The possibility of adverse health consequences resulting from this product is very remote. However, the FDA has determined that products made from concentrate with a patulin level of over 50 parts per billion are subject to a voluntary recall." (Denial)
- "These products may contain pistachios from [supplier], who are currently recalling pistachios due to potential contamination with Salmonella." (Excuse)
- "[Company] identified the inadequacies as part of a thorough, proactive product quality and process assessment of all [company] produced products...This product assessment is a key milestone in the implementation of that plan, and the actions being undertaken as a result of the assessment are part of [company's] ongoing commitment to ensure that all its products meet the high quality standards that consumers expect." (Justification)

One final note is for cases in which a firm had multiple press releases in response to separate recall events in the same quarter. Specifically, there are 44 press releases in my sample in which the company had previously issued a press release in the same quarter but to a separate recall event. In these cases, I considered each response type to be present if it was identified by the coders in any of the press releases from that quarter. For example, if a firm had two press releases in a given quarter, and in one press release made an apology but did not in the other, I still considered the apology to be present and dummy coded that firm-quarter observation as 1.

Moderator Variables

Involvement of other entities. The involvement of external firms (i.e.: suppliers or distributors) or subsidiary brands in the recall announcement was measured using a dummy
variable with 1 indicating that an external or subsidiary was implicated in the announcement and description of the recall by the FDA and 0 if no entity other than the parent was described. Though the firm itself is always announced as the recalling firm, the reason behind the recall can also include suppliers (if inputs to the firms goods were at fault for the recall), or even distributors or retailers (if the firm does not sell directly to consumers). Further, the FDA can report the parent firm or the firm's own subsidiary or an otherwise alternative brand name as the recalling firm. If either situation was true (whether the recall reason implicated an external entity or the recalling firm was a subsidiary or sub-brand within the corporate parent), I coded this dummy variable as 1. In addition to this dummy variable, I have also separately coded two additional dummy variables, one for external involvement (1=external involvement; 0=none) and the other for internal subsidiary or brand name involvement (1=alternative brand or subsidiary involvement; 0=none). This alternative method provides a robustness check for the initial hypothesis or test whether the external or internal involvement of an alternative entity is specifically influential to customers. For cases in which the firms had multiple press releases in the focal quarter for separate recall events, I coded these variables as 1 if either product recall referenced in the press releases had the involvement of a subsidiary, supplier, or both.

Firm recall history. I have measured the firm's recall history using a decay measure adapted from Zavyalova et al (2012). Zavyalova and colleagues use this decay measure to reflect the "social memory" of the firm's recall history, such that more recent recalls weigh more heavily on the social consciousness than do recalls that occurred longer ago. Because my study is similarly concerned with the social perception of a firm's recall history and the consequences of that perception, measuring my independent variable in a similar decaying manner is most logical.

I calculated this variable such that, for recalls occurring in quarter q, the number of recalls occurring in the preceding quarter (q-1) was multiplied by 1/1, the number of recalls occurring in the quarter before that (q-2) multiplied by 1/2, the number of recalls occurring in the quarter before that (q-3) multiplied by 1/3, so on and so forth. Each of these was then summed to create the measure of firm recall history.

Because the more time that is captured in this measure, the more restricted my sample will become, there is a trade-off in how many years of the firm's recall history this variable should encapsulate. Thus, my primary measure of firm recall history is for 1 year (4 quarters) preceding the recall event. However, I additionally calculated this measure using multiple timeframes, 3 years (12 quarters) and 5 years (20 quarters), for robustness purposes.

Frequency of similar recalls. The FDA categorizes each recall under their jurisdiction into 1 of 6 potential product types: biologics, cosmetics, devices, drugs, food, and veterinary. Much like for the firm recall history variable, I measured this variable using a decaying function of the count of recalls in the same category (but excluding those of the focal firm) as the focal recalls that occurred in the quarters preceding the focal recall events. Specifically, this function was calculated such that for a recall occurring in quarter q, the number of recalls in the same category in the previous quarter (q-1) is multiplied by 1/1, the number of recalls in the quarter preceding that quarter (q-2) multiplied by 1/2, the number of recalls in the quarter preceding that quarter (q-3) multiplied by 1/3, and so on. Much like for the firm recall history variable, I utilized a 1 year (4 quarter) measure of similar recalls for my primary analyses. I additionally utilized 3 year (12 quarter) and 5 year (20 quarter) measures for robustness purposes.

Recall severity. The FDA categorizes all recalls under its jurisdiction into one of three classes, "according to the level of hazard involved" with the product's particular safety issues, as

described by the FDA's website. Class I recalls are the most severe and potentially dangerous to public health and safety, as they are ones that could realistically (even if they had not at the time of recall) cause serious health problems or even death. Class II recalls are recalls of products that could cause more temporary health issues that tend to be less severe or threatening. Class III recalls are those that are unlikely to directly cause any adverse health consequences but violate certain labeling and manufacturing standards. I have reverse coded the FDA's classification system for the recall severity variable, such that more severe Class I recalls are coded as '2', Class II recalls are coded as '1', and Class III recalls are coded as '0'. For cases in which multiple press releases were made for separate recall events, I coded this variable to represent the most severe product recall.

Control Variables

I controlled for several factors that could also influence firm sales in ways unrelated to my theory and hypotheses. I have grouped these into firm-level, industry-level, and time-related control variable and describe each in the paragraphs that follow.

Firm-level controls. First and foremost, in order to most accurately test my hypotheses, I controlled for firm sales in the four quarters leading up to and including the quarter in which the recall occurred. This is essential so that the dependent variable is capturing the sales following the recall event relative to their prior sales (i.e.: the year-over-year change in sales reflecting a customer reaction) rather than the sheer amount of firm sales. Similarly, for assessments of only the next quarter's sales as the dependent variable, I controlled for firm sales in the corresponding quarter from the prior year to again capture year-over-year change in quarterly sales.

Further, to additionally control for the size of the firm, which is likely to be particularly influential for the firm's sales while also accounting for ebbs and flows in the size of the firm due to acquisitions and divestments, I controlled for the firm's assets (Zavyalova et al., 2012) and number of employees (Wowak et al., 2015) in the focal year, also using data from Compustat. Additionally, to account for the effects of the firm's product development activities, I controlled for their R&D expenditures (reported in Compustat) in the year of the recall event. Further, because more diversified firms may be less impacted by recall events in one particular segment of their organization, I controlled for the firm's diversification (using Palepu's (1985) entropy calculation). Importantly, though firm diversification is largely consistent within-firms across time, due to missing data in Compustat's Segments database, I utilized the within-firm mean of this variable. Finally, because the firm's reputation may influence how stakeholders are likely to react to a negative event related to the firm (Mishina, Block, and Mannor, 2012; Rhee and Haunschild, 2006), I have also controlled for the firm's reputation, such that any firm that appeared in the top 25 on Fortune's Most Admired Companies list in any year in my sample (Basdeo, Smith, Grimm, Rindova, and Derfus, 2006; Pfarrer et al., 2010).

Industry-level controls. In addition to these firm-level effects, I have also controlled for various industry-level effects, including the number of recalls in the same category (e.g.: devices, cosmetics, etc.) in the focal quarter, not including the focal firm's recalls. I calculated this based on a categorical variable of the recall category rather than firm SIC codes because more diversified firms may be classified in different industries than that of their focal recall. Instead, I captured recalls of products that are similar to that of the focal recall. In addition to industry recall activity, I also controlled for industry effects according to the SIC code classification of

each firm, including the dynamism and munificence of their primary industry, which has implications for the firm's sales.

Time-related controls. In order to account for differences in sales totals or the spread of information to customers across the years in this sample or throughout a given year, I have also controlled for year effects and quarter effects with dummy variables. Finally, I have controlled for the lag time (or the average lag time, in cases of multiple press releases) of number of days between the date on which the recall was initiated according to the FDA and the date of the press release associated with that recall.

Analysis

Because I am testing for interactive effects, I first standardized all non-dummy variables that served as components of the interactions before creating the multiplicative products of these components to be used as interaction terms (Baron and Kenny, 1986; Cohen, Cohen, Aiken, and West, 2003). For my hypothesis testing, I analyzed my data using both ordinary least squares (OLS) regression analysis and generalized estimating equation (GEE) modeling. Because my data is comprised of an unbalanced panel in which multiple observations occur within firms, I conducted GEE analyses as my estimation method most appropriate for dealing with the panel structure of my data. Importantly, GEE takes into account the within-group correlation that may result from repeated observations within the groups in my sample (Hardin and Hilbe, 2013). I conducted these analyses using an independence correlation structure, after results of a quasi-AIC demonstrated this to be the best working structure for my data (Pan, 2001). Though I report analyses using the independence correlation structure, results were generally consistent for tests using an exchangeable correlation structure as well. Also of note, the results of the GEE tests are

also generally robust to random-effects modeling as an additional measure of robustness for the estimation of this panel data. I reported the results of the GEE testing as the main analyses in the following section, with the results of the OLS analyses serving as supplemental analyses as well.

RESULTS

In this section, I present the results of the primary analyses of my hypothesized relationships. First, in Table 1, I present descriptive statistics and correlations of the variables in my primary models. I will briefly discuss some of the interesting findings from this table. Following that, I present the results of each of my four sets of hypotheses in Table 2, in which I used GEE modeling to test the hypotheses. Following this initial discussion of my primary analyses, I will also shed light on the results of my supplemental analyses (Tables 3-7), in which alternative analytical methods, dependent variables, and certain moderator variables are considered, as well as additional analyses (Table 8) that focus more in-depth on the firm responses themselves without the contingent recall-specific interactions.

Descriptive Statistics

As mentioned, Table 1 provides the descriptive statistics and correlation matrix for all of the variables included my primary models. In my sample, 86% of the press releases contained at least one of the four response types. As the summary statistics indicate, apologies appear in 23% of the press releases, denials appear in 28%, excuses appear in 28%, and justifications appear in nearly 50%. That justifications occur so frequently is unsurprising, given previous observations in the literature that justifications are among the most common responses firms give (Elsbach, 2012); however, Elsbach (2012) also asserts that excuses should be as well, so it may be surprising that excuses do not occur more frequently in my sample. It may be that following product recalls specifically, firms only make excuses largely when the recall's conditions allow them to but can more strategically decide to engage in justifications regardless of the focal recall's characteristics. One final note regarding the frequency of response types in the press

releases in my sample; 53% of these press releases contain just one response type, 33% contain more than one, and 14% contain none.

Because multiple responses occur fairly frequently in my sample, it is also worth noting the correlations between the different response types. The only significant correlation between the response types is that of justifications and excuses (r = -0.23), as despite the fact that those two responses appear the most frequently in my data, they are paired together among the least of any pairing. In addition to correlations between response types, the correlations between response types and recall characteristics merit some mention as well. Of note, the correlation between apologies and recall severity is negative and significant (r = -0.21), suggesting that firms are actually less likely to apologize when their recalls are more severe. Further, recall history and justifications are positively and significantly correlated (r = 0.21), suggesting that firms feel the need to justify their recall events more as their recent recall history becomes more extensive.

Primary Analyses

Table 2 reports the results of the primary analyses of my hypotheses predicting firm sales in the four quarters following the press release announcing a product recall. In these analyses, I utilized GEE modeling using an independence correlation structure to test my models. Specifically, Model 1 in Table 2 includes the control and predictor variables. Models 2 through 5 feature the inclusion of the interaction variables between firm responses and recall characteristics on which my hypotheses are focused. Model 2 includes the interactions of the four response types and recall severity, addressing Hypotheses 1a through 1e. Model 3 includes the interactions of the responses and the frequency of similar recalls for Hypotheses 2a through 2e. Model 4 includes interactions of the firm's response types and the firm's recall history, which pertain to

Hypotheses 3a through 3e. Finally, Model 5 includes the firm responses' interactions with the involvement of other entities on the recall for Hypotheses 4a through 4e.

Hypotheses 1a through 1d predict that the firm's responses would interact with recall severity, such that apologies and excuses would attenuate any likely negative effects of recall severity on customer reactions, but justifications and denials would exacerbate such effects. Further, Hypothesis 1e predicts that the moderating effects of justifications would be particularly dramatic relative to the other moderating effects. The results of the tests of these hypotheses are shown in Model 2 of Table 2. These results fail to provide support for any of these hypotheses, as the interactive effects of severity and apologies (b = 137.34; n.s.), denials (b = 621.41; n.s.), excuses (b = -595.90; n.s.), and justifications (b = -116.49; n.s.) are not significantly related to firm sales. Further, because none of these interactive effects is significant, the results fail to provide support for H1e, that justifications have a particularly dramatic moderating effect, as well.

Model 3 in Table 2 shows the results of the tests of Hypotheses 2a through 2d, which predict that the firm responses would interact with the frequency of similar recall events, such that apologies and excuses would attenuate the presumed positive effect of recall frequency on firm sales, but justifications and denial would exacerbate this effect. Hypothesis 2e, which predicts that the moderating effect of excuses would be particularly extreme, is also addressed in Model 3. The results in Model 3 fail to provide support for any of these hypotheses. Interestingly, the main effect of similar recall history is negatively related to firm sales (b = -4.60; p < .01), which demonstrates that firm sales is negatively impacted by greater quantities of recent recall activity, opposite of the supposition on which these hypotheses are based. The interactive effects of apologies (b = 3.95; n.s.), denials (b = 1.58; n.s.), excuses (b = 0.74; n.s.),

and justifications (b = 2.63; n.s.) are, thus, not significant, failing to provide any support for Hypotheses 2a through 2e.

Model 4 in Table 2 presents the results of the tests of Hypotheses 3a through 3e. Hypotheses 3a, 3b, 3c, and 3d predict that the firm responses interact with the presumed negative effect of firm recall history, such that, respectively, apologies attenuate, justifications exacerbate, excuses attenuate, and denials exacerbate this effect. Further, Hypothesis 3e predicts that the moderating effect of apologies is particularly extreme relative to the other moderating effects. The results presented in Model 4 show strong support for Hypotheses 3a and 3c, as the interactive effects of recall history and apologies (b = 119.80; p < .001) and excuses (b = 55.32; p < .05) are both positive and significant. These interactions are plotted in Figure 6, and these plots are quite similar to the interactions predicted in Hypotheses 3a and 3c as demonstrated in Figure 3. Specifically, when firm recall history is high, these interactions show that firm sales are better when the firm apologies or makes an excuse in their press releases than when they do not. To put these interactions in dollar figures, sales for firms that are one standard deviation above the mean recall history are, on average, \$785 million higher when they apologize versus when they do not and \$219 million higher when they make an excuse versus when they do not. Sales for firms that are one standard deviation below the mean recall history are, on average, \$653 million lower when they apologize versus when they do not and \$445 million lower when they make an excuse versus when they do not. When firm recall history is low, however, the interactions show that sales are better when the firm does not apologize or make an excuse

compared to when they do¹. Further, the interactions as well as the regression coefficients show that the moderating effect of apologies is particularly extreme compared to that of excuses, providing support for Hypothesis 3e. Despite this support, the results from Model 4 do not provide support for Hypothesis 3b and 3d, as neither of the interactive effects of recall history and justifications (b = 56.99; n.s.) nor denials (b = 39.06; n.s.) are significant.

Model 5 in Table 2 presents the results of the tests of Hypotheses 4a through 4d, which predict that the firm responses would interact with the involvement of other entities on the focal recall, such that apologies and justifications would attenuate the presumed positive effect of the involvement of such entities on the recall, but excuses and denials would exacerbate this effect. Further, Hypothesis 4e predicts that the moderating effect of excuses would be particularly extreme. However, the results in Model 5 show that the involvement of such entities is negatively related to firm sales (b = -1135.05; p < .05), which is opposite of the supposition on which these hypotheses are based. Further, the results demonstrate no significant effects of the interaction between the involvement of other entities and apologies (b = 380.70; n.s.), denials (b = -52.74; n.s.), and excuses (b = 428.79; n.s.), failing to provide support for Hypotheses 4a, 4c, and 4d. Additionally, because there is no significant moderating effect of excuses, the results fail to provide support for Hypothesis 4e as well. Model 5 does, however, demonstrate that the interactive effect of the involvement variable and justifications is positive and marginally significant (b = 908.06; p < .10); though this effect is marginal, it opposes my prediction in Hypothesis 4b, that justifications would attenuate the positive effect of the involvement variable.

¹ Through supplemental analyses, I also separately contrast coded each response type (e.g., apologies) to its non-response (e.g., non-apologies) and to press releases in which none of the response types were given (e.g., "no accounts"). I find robust support for these interactions in which the contrasts are non-responses but not for the "no accounts" contrast. Importantly, these supplemental findings suggest that while I cannot make claims about the effectiveness of apologies or excuses relative to firms that give "no accounts", I can more convincingly assert the relative effectiveness of apologies or excuses to non-apologies and non-excuses as well as to justifications and denials.

To summarize, of the 16 hypothesized interactions, only two were supported by these analyses. Importantly, however, both of these supported interactions pertained to the same recall characteristic (firm recall history) and were consistent theoretically with one another. Though my overriding arguments and predictions that characteristics of the recall event are crucially important to how customers assess the manner in which firms respond to their recall events went largely unsupported by my data, there does appear to be strong evidence that the firm's recall history does help shape customer reactions to firm response efforts. These findings will be examined in further detail in the discussion.



Figure 6 – Interaction Effects of Firm Recall History with Apologies and Excuses

Supplemental Analyses

In addition to my primary analyses described above and presented in Table 2, I also conducted a series of supplemental analyses for alternative analytical techniques, dependent variable time windows, and forms of certain recall characteristic variables. The results of these supplemental analyses are presented in Tables 3 through 7.

Table 3 presents the results of a replication of my primary analyses, but rather than using the GEE panel estimation technique, I conducted these analyses using OLS. Though I consider the GEE analyses to be more appropriate for my data given that many of the firms in my sample appear more than once, I conducted OLS as an additional robustness test. The results of these tests are presented identically to those in Table 2, such that Model 1 reports results of just the control and predictor variables, Model 2 includes the interactions of each response type with recall severity, Model 3 includes interactions with frequency of similar recalls, Model 4 includes interactions with firm recall history, and Model 5 includes interactions with the involvement of other entities. Importantly, and for brevity's sake, of the 13 interaction effects that were not significant in the GEE analyses, all of them were similarly non-significant in the OLS analyses. The interaction between justification and involvement of other entities, which was previously marginally significant and opposite of what I predicted in Hypothesis 4b, is not significant in the OLS analyses as well (b = 908.06; n.s.). Most importantly, however, in this supplemental analysis is whether or not the interactions that supported Hypotheses 3a and 3c in the GEE analyses were replicated. In Model 4 of Table 3, I find robust support for Hypothesis 3a, as the interactive effect of firm recall history and apologies is positive and significant (b = 119.80; p < 100.05). However, the interaction between recall history and excuses is not significant (b = 55.32; n.s.), failing to provide additional support for Hypothesis 3c.

Table 4 presents the results of both GEE and OLS analyses testing whether or not there are any differences in the results for Hypotheses 4a through 4e if the involvement of other entities variable is separated into the involvement of a subsidiary and the involvement of a supplier. Models 2 and 5 of Table 4, respectively, present the results of the GEE and OLS analyses including the interactions of the response types and the involvement of a subsidiary. Both Models 2 and 5 fail to provide support for Hypotheses 4a through 4e with this involvement variable, as none of the apology, denial, excuse, and justification interaction variables are significant. Models 3 and 6 present the results of the interactions of the response types and the involvement of a supplier. These results largely replicate the findings from the primary analyses in Table 2, as the apology, denial, and excuse interactions are not significant. Further, the justification (b = 2006.90; p < .05 in both models) interaction is positive and significant, whereas it is only marginally significant in the primary analyses, providing stronger and more robust support for this finding that is opposite of my prediction in Hypothesis 4b.

Tables 5 and 6 report the results of interactions using longer time windows for the frequency of similar recalls and firm recall history variables than those in the primary analyses. Whereas the primary analyses use measurements of these variables from the previous four quarters, Table 5 uses a three-year version of this variable, and Table 6 uses a five-year version. In Table 5, Models 2 and 5 (GEE and OLS, respectively), show that though the other interactions are not significant, the interaction between frequency of similar recalls in the previous three years and apologies is positive and marginally significant (b = 3.56; *p* < .10 in both models), an effect opposite of what I predicted in Hypothesis 2a. Using the five-year window, Models 2 and 5 in Table 6 yield similar findings, including the positive and marginally significant interactive effect of similar recall frequency and apologies (b = 3.78; *p* < .10 in both models).

For the recall history variables, Model 3 and 6 in Table 5 (using three-year history variables) fails to provide robust support for the interaction of apologies and firm recall history (b = 23.86; n.s. in both models) as predicted in Hypothesis 3a. Further, the interaction of excuses and firm recall history, is not shown to be significant in Models 3 and 6 (b = 16.85; n.s. in both models), failing to provide additional support for Hypothesis 3c. Both models do, however, show a positive and significant interactive effect of denials and recall history (b = 89.12; p < .05 in both models), opposite of what I predicted in Hypothesis 3d. In Table 6 (using five-year history variables), Models 3 and 6 show that these results largely hold, including the positive effect interactive effect of denials and recall history (b = 64.50; p < .05 in OLS model and p < .05 in GEE model). I am cautious about the results of these tests using longer recall history windows, however, as these analyses do not allow me to preserve observations from earlier in my sample. Specifically, the FDA data goes back as far as 2004, so recalls in my sample occurring in 2006 are restricted from the analyses with three-year variables and recalls occurring from 2006 to 2008 are restricted from the analyses with five-year variables, in both cases reducing my sample size from 226 firm-quarters to 209 and 163, respectively.

Finally, Table 7 presents the results comparing findings from tests using the firm's fourquarter sales as the dependent variable and those using next-quarter sales. To save space, I only present the results for the predictor and interaction variables in my models. Models 1 and 2 present the results from the GEE and OLS analyses, respectively, predicting four-quarter firm sales. These come directly from Tables 2 and 3 and have already been discussed. Models 3 and 4 are the respective GEE and OLS models predicted firm sales in just the next quarter following the recall press release. Importantly, I find that the interaction effects of recall history and apologies and excuses are not significant using this dependent variable, failing to provide

additional support for Hypotheses 3a and 3c. The only significant interaction in these analyses is that of frequency of similar recalls and justifications. Both Models 3 and 4 show that this interactive effect is positive and significant (b = 2.07; p < .01 in both models), which does provide some support for Hypothesis 2b.

Additional Analyses

Though my theorizing in this dissertation is largely about the contingent effects of firms' recall responses based on the characteristics of the actual recall event, I think it is important to more fully consider and explore the effects of these firm responses independent of the contingent factors. Despite the fact the much of the research related crisis management and trust repair literatures has largely yielded equivocal or situational findings of the effectiveness of a given response to a negative event in mitigating harm done to the central relationship, my study is relatively unique to much of this research and could still contribute with a further exploration of these main effects. Specifically, this type of quantitative study connecting actual firm communications to important strategic variables is fairly rare in the literature, as are studies simultaneously examining all four response to product recalls is still very much in doubt and empirical evidence is needed to shed further light on this important inquiry for organizations.

Though my discussion of the results in Table 2 focused heavily on the interaction effects from my hypotheses, I also wish to discuss the main effects of each response type in these models as well. Specifically, in Model 1 of Table 2, results show that while apologies (b = 8.08; n.s.) and excuses (b = -77.53; n.s.) are not significantly related to ensuing firm sales, denials and justifications do have an effect. Denials are negatively and marginally significantly (b = -626.41;

p < .10) related to firm sales in the four quarters following recall press releases, but justifications are positively and significantly (617.86; p < .05) related to sales². These findings are interesting for a number of reasons. First, firms that are apologetic in their press releases do not appear to significantly improve or worsen their relationships with their customers, whereas those who justify the recall event do seem to improve theirs. Thus, though arguments and evidence from prior research have suggested that being "accommodative" or assuming responsibility is beneficial in situations like recalls (e.g., Bundy and Pfarrer, 2015; Conlon and Murray, 1996; Zavyalova et al., 2012), my results indicate that it is not important for firms to just "be accommodative" but "how the firm is accommodative". Second, the difference in findings between the more "defensive" accounts suggest that firms are at least better off attempting to make excuses for their recalls rather than try to outright deny the presence of an issue at all. Taken together, these findings suggest that the literature's focus on dichotomizing responses as "accommodative" or "defensive" is severely limiting, as a firm that is "accommodative" in the form of an apology will experience similar results to a firm that is "defensive" in the form of an excuse. Instead, my study appears to provide some evidence that this distinction is not as instrumental for firms as the specific manner in which they are accommodative or defensive. Further, these results provide quantitative empirical evidence of an argument made by Elsbach (2012) that firms responding to their negative events would be best to engage in a more "rational" dialogue with important audiences, which may be best achieved in this context by justifications.

In addition to these main effect findings, I also explored the potential effects of the different combinations of firm response types, as many firms engaged in multiple response types

² These results were robust to contrast coding that contrasts each response (e.g., justifications) specifically to its non-response (e.g., non-justifications) as well as to "no account" press releases, further asserting the generally positive outcomes of justifications and negative outcomes of denials.

in their press releases. These findings are presented in Table 8 using both GEE analyses (Models 1 and 2) and OLS (Models 3 and 4). I simultaneously analyzed the effects of each of the six possible two-response type combinations that firms can employ. Of the six, my results show that two are particularly influential: apologies with denials and apologies with justifications. Specifically, press releases which included both apologies and denials had a negative and marginally significant effect on ensuring firm sales (b = -1662.09; p < .10 in both models). On the other hand, press releases which included apologies with justifications had a positive and significant effect on firm sales (b = 1313.81; p < .05 in both models). Interestingly, though earlier results suggest that apologies, in and of themselves, are inconsequential in terms of their effects on firm sales, they can be quite important depending on the other response type with which the firm may pair the apology. Specifically, apologies appear to act as a "lightning rod", exacerbating both the positive effects of justifications and the negative effects of denials, as the strength of the effects of these combination variables is more pronounced than those of the individual responses in Table 2. The role of an apology as a "complimentary" firm response, as it appears to be in this data, is an interesting one in that researchers have tended to focus heavily on the apology in crisis management and trust repair research on its own merits, particularly in searching for when apologies are beneficial and when they are detrimental. Here, apologies being helpful or harmful seem to depend largely on the other responses with which firms employ them.

DISCUSSION

In this study, I sought to add to our understanding of stakeholder responses to firms' product recalls and the manner in which firms respond to those recall events using theory and research from organizational perception management (Elsbach, 2003) and crisis management literatures (Coombs, 2007; 2010). Specifically, I argued for and developed a contingency-based theory of firm responses to product recalls, such that the effectiveness of those responses in managing the firm's relationship with its customers is largely dependent on the characteristics of the recall event. As it relates to this overall thesis, my findings were decidedly mixed. Specifically, I found that the only recall characteristic that presented such a contingency was the firm's own recall history, such that firms with more extensive recall histories that apologized or made excuses for the focal event garnered better customer reactions, and those with less extensive histories earned better reactions when they did not apologize or make excuses.

The recall history of a firm is a particularly important characteristic because it reflects the degree to which the focal recall will be assessed as a "stable" firm issue. As such, firms experiencing a recall situation with more extensive recall histories need to communicate to their customers a "buck stops here" mindset in order to signal that the firm intends to make a conscious effort to change things moving forward such that future issues will be prevented. As I argued, my study finds that apologies and excuses, which are designed to "admit net harm", are better equipped to communicate such a message and modify the stability-related attribution that customers are otherwise likely to make (Tomlinson and Mayer, 2009; Weiner, 1986). On the other hand, and as the interaction plots in Figure 6 demonstrate, firms with less extensive histories may actually not want to communicate that substantial changes are needed, as customers are less likely to consider stable firm causes to be at the root cause of these recalls.

Further, and again as I argued, apologies are particularly focused on internal intentions to change, speaking most centrally to that stability dimension of attributions (Gold and Weiner, 2000; Tomlinson and Mayer, 2009). Thus, even more than excuses, apologies represent ideal responses for firms with more extensive histories and especially damaging responses for firms with less extensive histories. This effect can also be detected in the interaction plots in Figure 6, as the slope of the line for apologies is much steeper than that of excuses.

Other than the firm's recall history, however, my findings show that firm responses were largely not contingent on recall characteristics, such as severity, similar recall history, and involvement of others in the recall. These findings countered much of the theory that I developed and the overall notion that firm responses to their negative events need to be situated in the particular context presented by the event itself prevalent in crisis management (e.g.: Bundy and Pfarrer, 2015; Coombs, 2007) and trust repair (Kim *et al.* 2004; 2006; 2009; Tomlinson and Mayer, 2009) research. Bundy and Pfarrer (2015: 19) argue that, as a whole, recalls are high in "situational attributions", meaning that the relevant contingency to consider is simply the fact that the event is a recall rather than these other more micro-characteristics. It could also be the case that the particular characteristics used in this study are difficult for customers to become aware of, or that customer groups as a whole can only be so nuanced in their decision-making and that the theory I developed may have been too rational to reflect the realities of consumer perceptions and decisions.

The notion that customers may not be as nuanced in their decision-making as I theorized could also be reflected in the results of my additional analyses exploring the direct effects of each response type and combinations of response types on firm sales. Rather than responding contingently to firm responses based on the particular characteristics of the recall event,

customers generally react positively to the use of justifications in press releases following product recalls but negatively to the use of denials. Justifications have previously been touted as presenting more information and rationality to the dialogue following negative events (Elsbach, 2012), which audiences value and could make justifications ideal for firms to employ following events like product recalls. My study is the first, to my knowledge, to subject this general argument to empirical scrutiny at the firm-level and assert its impact on important strategic outcomes. Further, the finding that customers react negatively to denials could represent a rejection of the firm refusing to accommodate their concerns in any way. Denials refuse to admit that the firm was responsible for any wrongdoing or that any harm was done in the first place (Szwajkowski, 1992). Such an outright or extreme refusal seemingly fails to acknowledge the reality facing customers, even though doing so is likely necessary to preserve or repair perceptions of the firm following the negative event (Ashforth and Lee, 1990; Lewicki and Bunker, 1996).

In addition to these main effects of responses on firm sales, the analysis of different combinations of responses (Table 8) yielded interesting results as well. Specifically, combination responses of apologies and denials influence firm sales negatively, while apologies and justifications influence sales positively. In fact, with apologies included, the effects of denials and justifications are more influential than they are alone. Thus, apologies, while they have no significant main effect on their own, are actually quite important when considering them as compliments to other responses. It appears as though apologies act as a "lightning rod", exacerbating the reactions customers have to denials and justifications. For denials, customers may reject being simultaneously told by the firm that they have done nothing wrong but also consider customer safety as their primary objective, for example. This can be off-putting for

customers for a number of reasons, as they may view the firm as confusing, inept, or outright deceitful, each of which is likely to cause them to reconsider their ongoing relationship with the firm. On the other hand, apologies appear to enhance customers' positive reactions to justifications. Previously, I argued that justifications are likely to be received positively because they provide the customer with actual information about the firm's recall process and create a rational dialogue. It may be that apologies compliment that rationality with a more emotional approach, such that customers' fear or anger is more likely to subside with the assurances from the firm that it has the customers' best interests at heart. For as insincere as an apology may appear when paired with a denial, it may help establish sincerity when used in conjunction with a justification.

Altogether, these results provide strong evidence that, despite the fact that many of my hypotheses went unsupported by my data, the manner in which firms respond to their products is crucially important to managing their stakeholder relationships and important strategic outcomes. Specifically, how they frame their communications to stakeholders in terms of the negative event accounts that they give directly, in combination with one another, and in conjunction with their recall history affect their ensuing firm sales in relatively complex and nuanced ways. This set of results contributes, first and foremost, to product recall research, which has tended particularly in the management domain to focus on the antecedents to recalls and ultimate stakeholder outcomes. However, what has largely been missing in this line of research is how the firm actually manages its way through the recall process to mitigate any harm done to its important stakeholder relationships. This study is a valuable step in that direction and a necessary piece to the overall puzzle of how firms and their managers can actually manage adverse situations to preserve their important stakeholder relationships.

The results of my study also provide valuable insights to the organizational perception management and crisis management literatures. Specifically, management researchers have traditionally studied firm responses to negative events using a continuum or dichotomy of "accommodative" and "defensive". This dissertation highlights the limitation of such frameworks rather than more fully considering the four accepted forms of responses to negative events in a number of ways. First, rather than firms benefitting or being harmed by accommodativeness or defensiveness, my results show that how they accommodate or defend is really what drives those effects. For example, a firm that is accommodative through apologies is not shown in my data to really benefit but rather only does when that accommodativeness is expressed through justifications. Similarly, defensiveness in the form of excuses is not detrimental; firms are only harmed when they defend themselves in the form of denials. Further, the interactions of apologies and excuses with the firm's recall history highlights this point as well. Despite the fact that these two response types are likely to be considered more accommodative and more defensive, respectively, their interactive effects with firm recall history are largely similar to one another, which follows from the theory that I developed in this dissertation.

Finally, previous studies focused on accommodativeness and defensiveness seldom, if ever, consider firms that engage in multiple types of responses in their communication efforts. By doing so, my study demonstrates how much firms can benefit from engaging in multiple types of accommodativeness (apologies and justifications) but also, perhaps more interestingly, how dramatically they can be harmed by engaging in both accommodativeness and defensiveness (apologies and denials). These results also highlight a unique role of apologies

relative to much of the prior work in this and related literatures; in my study, apologies act as a "lightning rod", exacerbating the effects of justifications and denials on firm sales.

In addition to the theoretical contributions made by focusing on all four response types to negative events, my study makes empirical contributions as well. First, I developed a rigorous procedure to code actual firm press releases for each of the four response types which yielded strong reliability between coders. This is, to my knowledge, the first attempt to code firm press releases for all four response types, rather than two or three, in any context. Additionally, in using firm sales as the dependent variable, my study is one of few to connect these types of responses to an important strategic financial outcome. Most of the work studying these responses explores them qualitatively or tests their effects on individual relationships using survey data. Instead, I opted for a study design in which I assembled a large cross-sectional dataset that explores the between-firm effects of firm responses on financial outcomes. This study's design and its findings can contribute to the literature by asserting the strategic importance of the how firms decide to communicate with their stakeholders following negative events and serving as an example for how researchers can continue to explore strategic-level consequences of these firm responses moving forward.

Altogether, the findings from my study provide valuable insights for executives attempting to guide their firm through an adverse situation, especially a product recall, in such a way that the firm's relationship with customers, and potentially other important stakeholders, remains preserved. Specifically, the finding that justifications positively influence ensuing firm sales suggests that managers are well-served to provide information and transparency regarding their recall. Further, pairing apologies with justifications may add a level of sincerity and concern to which customers are likely to respond particularly favorably. On the other hand, firms

that refuse to acknowledge the presence of a problem associated with their recall for customers may be penalized. Further, pairing conflicting response types like denials with apologies is likely to confuse or further alienate customers, causing them to more heavily penalize the firm. Finally, firms with more extensive histories of a given type of negative event need to consider that history when developing a response, as it becomes increasingly important for firms to somehow indicate, whether through apologies or excuses, that conditions will be different moving forward such that these events should become less frequent in the future. Ultimately, it is quite clear from my findings that firms need to consider the perspective of stakeholders in their communications by acknowledging their concerns, helping them to understand the focal event, and providing them with reasons to be optimistic that similar negative events will not continue to occur.

Future Directions

I believe that there are several additional avenues for future research related to this dissertation, especially given its findings. First, because this study found evidence that the manner in which firms respond to their recalls is quite influential for important strategic outcomes, it is also crucial to explore how and why they develop the responses that they do. It is likely that these press releases and other forms of communication following an event such as product recalls are, at least in part, shaped by the firm's top managers, whether directly or indirectly. In fact, many of the press releases in my sample contain direct quotes from a senior executive. In light of this, it may be informative to explore the effects of CEO or top management team characteristics on the firm's response to product recalls or other negative events. For example, the CEO's narcissism (e.g., Chatterjee and Hambrick, 2007) may lead him or her to engage in more defensive responses, such as denials, which I found are likely to

alienate customers and suppress firm sales. It may also be that top management teams with greater amounts of throughput functional experience (e.g., Hambrick and Mason, 1984; Waller, Huber, and Glick, 1995) would be more likely to emphasize operational and technical details in their responses (e.g., justifications), whereas those with more output functional experience would be more mindful of their stakeholders and want to speak more directly to their emotional reactions (e.g., apologies). In either case, additional work is needed to more fully capture how and why firms develop the responses that they choose following negative events such as recalls.

Additionally, though I focus on customers as the stakeholder group of interest in my dissertation, it is likely also important to study how other stakeholders react to firm responses to their product recalls. Though market reactions are the most frequently studied performancerelated dependent variable in studies in this arena, no study has explored how markets respond to the use of the four responses to negative events clarified in Elsbach's (2003) organizational perception management framework, including in a product recall context. Additionally, the media is likely to cover the firm differently following a recall event depending on the firm's response, whether with more positive or negative sentiment (e.g., Zavyalova et al., 2012) or in the manner in which subsequent stories about the firm are framed. In addition to shareholders and the media, other stakeholder groups that researchers can study include security analysts, whose buy and sell recommendations may be affected by firm responses to recall events, or employees, whose job satisfaction or turnover intentions may be similarly influenced. Altogether, future studies that are able to compare and contrast the responses of different stakeholder groups to product recalls and firm responses can shed further light on the complex web of stakeholders that firms have to manage, particularly following negative events, and the ways in which this complicated endeavor leads to zero-sum or symbiotic situations.

Finally, moving beyond product recalls, the reaction of these various stakeholder groups to other types of negative events and the firm's use of the four response types discussed in my dissertation would also benefit the literature. Different types of events vary on dimensions likely to be influential to stakeholder reactions, whether situational attributions (e.g., Bundy and Pfarrer, 2015), competence and character (e.g., Mishina et al., 2012), or any of a number of other dimensions yet to be fully explored in this context. Though these important differences are likely to affect how stakeholders process the negative event and firm's response, cross-event type studies have occurred relatively infrequently in the literature (Marcus and Goodman, 1991). It would be interesting and crucially important to executives trying to understand how to manage these complex and delicate situations to see how stakeholder reactions are similar and different depending on whether they are going through a product recall, corporate scandal, or mass layoff. Further, especially with such limited quantitative exploration of actual firm communications and actions following negative events and the strategic consequences of those responses, many different types of negative events have received insufficient attention in strategic management research. Very few studies have explored the fallout from events such as layoffs and scandals, or others including employee accidents, pollutant spills, and cyber-attacks. In general, firms can be faced with many difficult situations, but the literature is relatively short on guiding principles for managers depending on the specific situation with which they are coping, and additional insights into the specific processes following these different events are needed.

CONCLUSION

Though many of my predictions were ultimately not supported by my data, this study has yielded a number of insights that indicate the manner in which firms respond to their product recalls heavily influences customer reactions to the recall event. Importantly, by simultaneously studying each of the four response types to negative firm events and by exploring them at the firm-level, the findings from this dissertation make important contributions to researchers of product recalls and organizational perception management, as well as practitioners who need greater insights from research into the process of overcoming negative firm events. Specifically, my findings show that firms which employ justifications following their recalls positively influence customer reactions, whereas those which make denials negatively influence customers. Further, for firms with more extensive recent recall histories, they are likely to earn better customer reactions when they make apologies or excuses in their responses than when they do not; however, the opposite is true for firms with less extensive histories. Finally, firms that complement justifications or denials with apologies exacerbate those effects.

APPENDIX

		Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1.	Firm sales ^a	24330.05	27777.30	1.00									
2.	Apology	0.23	0.42	-0.08	1.00								
3.	Denial	0.28	0.45	0.03	-0.01	1.00							
4.	Excuse	0.28	0.45	0.01	0.04	0.00	1.00						
5.	Justification	0.50	0.50	-0.12	-0.01	-0.07	-0.23	1.00					
6.	Recall severity	1.63	0.53	0.01	-0.21	-0.10	0.01	-0.05	1.00				
7.	Similar recall history	245.41	149.62	-0.05	-0.02	-0.15	0.04	-0.01	0.05	1.00			
8.	Firm recall history	3.35	6.01	0.30	-0.06	0.01	0.07	0.21	-0.11	0.16	1.00		
9.	Involvement of others	0.50	0.50	-0.02	0.04	0.01	0.01	-0.01	0.07	-0.02	0.10	1.00	
10.	Firm sales (lagged) ^a	23568.78	26730.05	0.99	-0.08	0.04	0.01	-0.13	0.01	-0.05	0.30	-0.01	1.00
11.	Firm size ^a	25531.25	36532.12	0.68	-0.06	0.05	-0.03	0.05	-0.18	-0.07	0.46	0.03	0.70
12.	Firm employees ^a	75.93	94.68	0.83	-0.06	0.03	0.02	-0.18	0.08	0.02	0.11	-0.06	0.82
13.	Firm R&D expenditures ^a	53.93	322.56	0.05	0.00	-0.09	0.01	0.15	-0.12	-0.07	0.29	0.06	0.04
14.	Firm diversification	0.48	0.58	0.29	-0.13	0.10	-0.11	0.16	-0.07	0.00	0.43	0.11	0.30
15.	Firm reputation	0.08	0.26	0.26	0.13	-0.03	0.01	-0.15	0.10	-0.07	-0.11	-0.08	0.26
16.	Industry recalls	135.17	101.44	-0.03	0.02	-0.01	0.35	-0.10	0.04	0.46	0.09	0.09	-0.03
17.	Industry dynamism	0.05	0.05	-0.15	-0.08	0.03	-0.09	0.02	0.12	-0.04	-0.17	0.07	-0.15
18.	Industry munificence	0.00	0.09	-0.12	0.12	-0.20	0.06	0.10	0.03	0.02	0.03	0.06	-0.12
19.	Press release lag time	5.78	16.40	-0.11	0.06	-0.13	-0.05	0.01	-0.06	0.12	0.20	-0.07	-0.11

Table 1 – Descriptive Statistics and Correlations

		Mean	S.D.	11	12	13	14	15	16	17	18	19	
11.	Firm size ^a	25531.25	36532.12	1.00									
12.	Firm employees ^a	75.93	94.68	0.35	1.00								
13.	Firm R&D expenditures ^a	-53.93	322.56	0.14	-0.01	1.00							
14.	Firm diversification	0.48	0.58	0.50	0.10	-0.08	1.00						
15.	Firm reputation	0.08	0.26	0.25	0.28	0.05	0.25	1.00					
16.	Industry recalls	135.17	101.44	-0.06	0.01	0.07	-0.04	-0.02	1.00				
17.	Industry dynamism	0.05	0.05	-0.08	-0.12	0.06	0.19	-0.04	-0.04	1.00			
18.	Industry munificence	0.00	0.09	-0.11	-0.10	-0.09	-0.06	-0.06	-0.05	0.05	1.00		
19.	Press release lag time	5.78	16.40	-0.04	-0.11	-0.06	0.17	-0.08	0.03	-0.08	-0.02	1.00	

 Table 1 (cont'd)

n = 226 for complete data

^a Firm financial data from Compustat in millions of dollars; employee data in thousands of people Significance cutoffs: ***p < .001: 0.19; ** p < .01: 0.18; * p < 0.05: 0.13

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	1385.03*	1345.00^{*}	1398.29*	1497.72^{*}	1658.07^{*}
-	(651.61)	(646.42)	(633.45)	(716.60)	(764.50)
Controls					
Firm sales (lagged)	1.06^{***}	1.06^{***}	1.06^{***}	1.06^{***}	1.06^{***}
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Firm size	-0.03**	-0.03**	-0.03**	-0.03**	-0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Firm employees	-0.79	-0.87	-0.14	-0.83	-0.03
	(2.89)	(2.84)	(2.85)	(2.89)	(2.97)
Firm R&D expenditures	0.40	0.32	0.44	0.39	0.44
	(0.50)	(0.49)	(0.51)	(0.45)	(0.51)
Firm diversification	-143.06	-155.33	-27.41	-120.33	-134.53
	(314.51)	(321.68)	(293.73)	(305.96)	(341.48)
Firm reputation	340.51	412.63	24.35	363.89	262.03
	(608.11)	(645.82)	(572.10)	(611.86)	(613.84)
Industry recalls	-0.07	0.09	0.01	-0.12	-0.31
	(1.36)	(1.50)	(1.43)	(1.31)	(1.36)
Industry dynamism	1542.39	1549.83	913.84	1240.70	1988.82
	(2423.50)	(2419.94)	(2621.95)	(2531.22)	(2762.68)
Industry munificence	-1784.42	-1644.83	-1518.77	-1525.78	-1868.98^{\dagger}
	(1182.10)	(1317.72)	(1213.16)	(1184.07)	(1119.88)
Press release lag time	-10.87	-9.91	-11.35	-8.57	-11.05
	(6.90)	(6.85)	(7.05)	(7.03)	(7.16)
Year dummy variables	included	included	included	included	included
Quarter dummy variables	included	included	included	included	included
Recall characteristics					
Recall severity	457.46	429.81	512.20	485.12	524.24
·	(386.90)	(550.41)	(383.81)	(394.09)	(402.28)
Similar recall activity	-1.89 [*]	-2.11*	-4.60 ^{***}	-1.69 [*]	-1.82*
·	(0.82)	(0.88)	(1.65)	(0.81)	(0.82)
Firm recall history	47.51	53.02	44.86	-53.04	46.75
•	(36.68)	(38.72)	(37.10)	(78.85)	(34.54)
Involvement of others on recall	-489.02*	-499.38 [*]	-517.38*	-485.43 [†]	-1135.05*
	(241.12)	(230.62)	(238.42)	(256.08)	(522.62)
Firm responses					
Apology	8.08	1.83	80.62	39.80	-211.11
1 67	(342.15)	(357.93)	(362.36)	(305.47)	(379.37)
Denial	-626.41 [†]	-626.69 [†]	-611.04	-683.55*	-615.44 [†]
	(352.84)	(361.14)	(333.13)	(337.39)	(329.81)
Excuse	-77.53	-91.07	-34.78	-124.86	-288.14
	(255.78)	(250.34)	(251.21)	(240.83)	(368.25)
Justification	617.86*	621.87*	576.51 [†]	554.82 [†]	166.78
	(290.07)	(299.05)	(302.81)	(287.06)	(311.45)

 Table 2 – GEE Models Predicting Firm Sales

	Table 2 (cont'd)			
Interactions				
Apology*Severity	137.34			
	(501.06)			
Denial*Severity	621.41			
	(732.06)			
Excuse*Severity	-595.90			
	(498.78)			
Justification*Severity	-116.49			
	(419.94)			
Apology*Similar Recalls		3.95		
		(2.76)		
Denial*Similar Recalls		1.58		
		(1.74)		
Excuse*Similar Recalls		0.74		
		(1.96)		
Justification*Similar Recalls		2.63		
		(1.77)	***	
Apology*History			119.80	
			(34.44)	
Denial*History			39.06	
			(43.24)	
Excuse*History			55.32*	
			(25.04)	
Justification*History			56.99	
			(60.60)	
Apology*Involvement				380.70
				(815.81)
Denial* Involvement				-52.74
				(542.21)
Excuse* Involvement				428.79
				(546.78)
Justification* Involvement				908.06
				(538.22)

n = 226*** p < .001; ** p < .01; * p < .05; † p < .10Standard errors are in parentheses.

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	1385.03 [†]	1345.00 [†]	1398.29 [†]	1497.72 [†]	1658.07^{*}
	(766.57)	(791.25)	(753.75)	(808.77)	(830.10)
Controls					
Firm sales (lagged)	1.06^{***}	1.06^{***}	1.06^{***}	1.06^{***}	1.06^{***}
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Firm size	-0.03*	-0.03*	-0.03*	-0.03*	-0.03 [*]
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Firm employees	-0.79	-0.87	-0.14	-0.83	-0.03
	(2.95)	(2.88)	(2.97)	(2.94)	(2.99)
Firm R&D expenditures	0.40	0.32	0.44	0.39	0.44
-	(0.60)	(0.59)	(0.61)	(0.56)	(0.62)
Firm diversification	-143.06	-155.33	-27.41	-120.33	-134.53
	(402.42)	(418.59)	(401.71)	(401.99)	(412.89)
Firm reputation	340.51	412.63	24.35	363.89	262.03
	(627.09)	(653.64)	(590.58)	(625.01)	(636.05)
Industry recalls	-0.07	0.09	0.01	-0.12	-0.31
	(1.81)	(1.96)	(1.87)	(1.75)	(1.84)
Industry dynamism	1542.39	1549.83	913.84	1240.70	1988.82
	(2500.60)	(2478.05)	(2670.59)	(2534.65)	(2596.99)
Industry munificence	-1784.42	-1644.83	-1518.77	-1525.78	-1868.98
	(1213.99)	(1319.54)	(1233.66)	(1256.35)	(1209.80)
Press release lag time	-10.87	-9.91	-11.35 [†]	-8.57	-11.05
	(6.84)	(7.24)	(6.72)	(7.32)	(7.11)
Year dummy variables	included	included	included	included	included
Quarter dummy variables	included	included	included	included	included
Recall characteristics					
Recall severity	457.46	429.81	512.20	485.12	524.24
5	(325.30)	(535.22)	(322.18)	(325.36)	(329.71)
Frequency of similar recalls	`-1.89 [†]	-2.11 [†]	-4.60 [*]	-1.69	-1.82
	(1.14)	(1.21)	(2.04)	(1.16)	(1.14)
Firm recall history	47.51	53.02	44.86	-53.04	46.75
•	(34.44)	(35.19)	(33.71)	(83.51)	(33.49)
Involvement of others on recall	-489.02^{\dagger}	-499.38 [†]	-517.38 [†]	-485.43 [†]	-1135.05*
	(272.47)	(275.90)	(279.57)	(281.48)	(574.31)
Firm responses					
Apology	8.08	1.83	80.62	39.80	-211.11
1 00	(377.52)	(396.05)	(368.79)	(374.14)	(419.90)
Denial	-626.41	-626.69	-611.04	-683.55 [†]	-615.44
	(390.30)	(410.69)	(396.63)	(388.23)	(436.59)
Excuse	-77.53	-91.07	-34.78	-124.86	-288.14
	(302.89)	(311.89)	(299.40)	(297.25)	(434.49)
Justification	617.86^{\dagger}	621.87^{\dagger}	576.51 [†]	554.82 [†]	166.78
	(314.99)	(318.70)	(306.03)	(314.06)	(396.96)

Table 3 – OLS Models Predicting Firm Sales

	Table 3 (cont'd)			
Interactions				
Apology*Severity	137.34			
	(662.82)			
Denial*Severity	621.41			
	(656.55)			
Excuse*Severity	-595.90			
	(598.46)			
Justification*Severity	-116.49			
	(588.17)	÷		
Apology*Similar Recalls		3.95		
		(2.36)		
Denial*Similar Recalls		1.58		
		(2.66)		
Excuse*Similar Recalls		0.74		
		(2.41)		
Justification*Similar Recalls		2.63		
A		(1.95)	110.90*	
Apology*History			(54.01)	
Danial*Ilistan			(54.91)	
Denial*History			39.00	
Exauga*Uistory			(49.63)	
Excuse Thistory			(17, 33)	
Justification*History			(47.33)	
Justification Thistory			(75.64)	
Apology*Involvement			(75.04)	380 70
Apology involvement				(709.24)
Denial* Involvement				-52 74
Demai myörvement				(688.89)
Excuse* Involvement				428.79
				(576.86)
Justification* Involvement				908.06
				(611 31)

n = 226*** p < .001; ** p < .01; * p < .05; † p < .10Standard errors are in parentheses.
	GEE Models			OLS Models			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	
Intercept	1439.97*	1617.53 [*]	1597.83 [*]	1439.97 [†]	1617.53 [*]	1597.83 [*]	
	(671.85)	(730.04)	(725.68)	(773.18)	(785.28)	(795.30)	
Controls							
Firm sales (lagged)	1.06^{***}	1.06^{***}	1.06^{***}	1.06^{***}	1.06^{***}	1.06^{***}	
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	
Firm size	-0.03**	-0.03**	-0.02**	-0.03*	-0.03*	-0.02^{*}	
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	
Firm employees	-0.38	-0.46	0.18	-0.38	-0.46	0.18	
	(2.94)	(2.94)	(2.86)	(2.94)	(2.99)	(2.91)	
Firm R&D expenditures	0.38	0.35	0.45	0.38	0.35	0.45	
	(0.51)	(0.47)	(0.51)	(0.61)	(0.55)	(0.62)	
Firm diversification	-192.38	-159.38	-212.77	-192.38	-159.38	-212.77	
	(317.49)	(310.01)	(293.97)	(393.36)	(401.55)	(396.81)	
Firm reputation	303.54	375.34	338.64	303.54	375.34	338.64	
	(601.94)	(599.90)	(591.15)	(634.33)	(648.37)	(664.59)	
Industry recalls	0.03	-0.58	-0.28	0.03	-0.58	-0.28	
	(1.37)	(1.41)	(1.42)	(1.76)	(1.76)	(1.73)	
Industry dynamism	2040.60	1700.53	2465.20	2040.60	1700.53	2465.20	
	(2490.40)	(2462.09)	(2516.09)	(2421.94)	(2451.97)	(2566.86)	
Industry munificence	-1831.00	-1757.51	-2342.18 [†]	-1831.00	-1757.51	-2342.18 [†]	
	(1186.23)	(1107.08)	(1355.38)	(1202.30)	(1199.23)	(1354.55)	
Press release lag time	-10.06	-9.89	-11.21	-10.06	-9.89	-11.21	
	(7.17)	(6.90)	(6.93)	(7.03)	(6.76)	(6.97)	
Year dummy variables	included	included	included	included	included	included	
Quarter dummy variables	included	included	included	included	included	included	
Recall characteristics							
Recall severity	493.94	458.85	634.65	493.94	458.85	634.65^{*}	
-	(397.87)	(395.43)	(395.00)	(326.62)	(322.22)	(316.63)	
Frequency of similar recalls	-1.86*	-1.67^{\dagger}	-1.60^{\dagger}	-1.86	-1.67	-1.60	
	(0.82)	(0.88)	(0.85)	(1.13)	(1.19)	(1.15)	
Firm recall history	43.71	45.60	45.39	43.71	45.60	45.39	
-	(35.98)	(34.95)	(34.37)	(34.07)	(33.49)	(33.24)	

Table 4 – Involvement Component Interactions

			(cont u)			
Involvement of subsidiary	-288.59	-372.86	-262.56	-288.59	-372.86	-262.56
	(249.97)	(496.27)	(253.59)	(274.16)	(514.79)	(274.46)
Involvement of supplier	-783.93*	-763.79^{*}	-1042.34^{\dagger}	-783.93 [*]	-763.79^{*}	-1042.34
	(355.27)	(349.56)	(633.55)	(384.84)	(385.06)	(674.17)
Firm responses						
Apology	70.05	-281.13	302.52	70.05	-281.13	302.52
	(326.79)	(344.66)	(335.31)	(370.49)	(437.68)	(366.51)
Denial	-552.09^{\dagger}	-734.09 [†]	-289.71	-552.09	-734.09	-289.71
	(316.80)	(403.11)	(261.05)	(365.38)	(488.63)	(338.02)
Excuse	-59.19	99.41	-331.26	-59.19	99.41	-331.26
	(258.94)	(306.23)	(309.50)	(304.73)	(376.19)	(341.90)
Justification	561.58^*	608.85^{\dagger}	247.23	561.58^{\dagger}	608.85	247.23
	(281.04)	(362.89)	(271.43)	(305.30)	(378.31)	(323.42)
Interactions						
Apology*Subsidiary		1002.24			1002.24	
		(625.11)			(723.93)	
Denial*Subsidiary		630.27			630.27	
		(533.49)			(758.43)	
Excuse*Subsidiary		-502.55			-502.55	
		(630.50)			(602.65)	
Justification*Subsidiary		-247.68			-247.68	
		(527.24)			(547.22)	
Apology*Supplier			-1169.19			-1169.19
			(1002.84)			(919.95)
Denial* Supplier			-1295.48			-1295.48
			(952.65)			(1154.49)
Excuse* Supplier			1326.36			1326.36
			(884.40)			(879.82)
Justification* Supplier			2006.90^{*}			2006.90^{*}
			(958.91)			(922.74)

Table 4 (cont'd)

n = 226

*** p < .001; ** p < .01; * p < .05; † p < .10Standard errors are in parentheses.

	GEE Models			OLS Models		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	-97.38	-23.85	86.73	-97.38	-23.85	86.73
*	(662.23)	(583.94)	(710.66)	(733.56)	(733.24)	(729.91)
Controls						
Firm sales (lagged)	1.07^{***}	1.06^{***}	1.07^{***}	1.07^{***}	1.06^{***}	1.07^{***}
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Firm size	-0.04***	-0.03***	-0.04***	-0.04***	-0.03**	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Firm employees	-2.13	-1.42	-1.69	-2.13	-1.42	-1.69
	(2.93)	(2.94)	(2.87)	(2.96)	(3.03)	(2.92)
Firm R&D expenditures	6.53***	6.61^{***}	7.50^{***}	6.53^{***}	6.61***	7.50^{***}
	(1.68)	(1.47)	(1.55)	(1.38)	(1.27)	(1.67)
Firm diversification	-329.86	-255.48	-289.63	-329.86	-255.48	-289.63
	(343.24)	(321.37)	(334.01)	(417.10)	(403.06)	(416.29)
Firm reputation	850.16	574.12	817.06	850.16	574.12	817.06
	(544.26)	(494.08)	(547.26)	(631.35)	(582.87)	(643.89)
Industry recalls	-0.03	-0.05	-0.24	-0.03	-0.05	-0.24
	(1.39)	(1.47)	(1.36)	(1.87)	(1.92)	(1.84)
Industry dynamism	5270.17	5293.74	6042.67	5270.17	5293.74	6042.67
	(3981.56)	(4168.84)	(4189.57)	(3714.29)	(3792.64)	(3844.00)
Industry munificence	-1516.68	-1360.06	-1759.68	-1516.68	-1360.06	-1759.68
	(1400.55)	(1388.94)	(1459.37)	(1380.19)	(1370.03)	(1467.33)
Press release lag time	-5.94	-5.73	-1.52	-5.94	-5.73	-1.52
	(6.00)	(6.10)	(6.80)	(6.80)	(6.54)	(7.22)
Year dummy variables	included	included	included	included	included	included
Quarter dummy variables	included	included	included	included	included	included
Recall characteristics						
Recall severity	275.87	285.02	334.99	275.87	285.02	334.99
Ş	(308.88)	(296.83)	(328.73)	(326.46)	(320.10)	(331.59)
Frequency of similar recalls (3 yrs)	-1.23 [*]	-2.93 [*]	`-1.06 [†]	-1.23	-2.93 [†]	-1.06
	(0.61)	(1.22)	(0.60)	(0.85)	(1.51)	(0.86)
Firm recall history (3 yrs)	19.22	20.12	-19.31	19.22	20.12	-19.31
	(26.86)	(26.48)	(54.50)	(24.95)	(24.38)	(57.25)

Table 5 – Three-Year Firm History and Similar Recall History Interactio

		-	-			
Involvement of others on recall	-440.39 [†]	-424.94 [†]	-490.92 [†]	-440.39	-424.94	-490.92
	(247.18)	(236.80)	(273.22)	(287.09)	(287.41)	(300.57)
Firm responses						
Apology	-313.33	-229.48	-320.74	-313.33	-229.48	-320.74
1	(318.53)	(314.20)	(308.63)	(353.35)	(331.47)	(357.57)
Denial	-361.53	-321.01	-359.18	-361.53	-321.01	-359.18
	(424.47)	(396.66)	(374.95)	(417.28)	(426.44)	(410.68)
Excuse	-80.90	-41.21	-145.69	-80.90	-41.21	-145.69
	(277.08)	(278.35)	(267.22)	(311.49)	(308.15)	(312.55)
Justification	490.14 [†]	456.99	318.36	490.14	456.99	318.36
	(278.83)	(294.28)	(277.80)	(315.34)	(311.98)	(318.28)
Interactions						
Apology*Similar Recalls		3.56^{\dagger}			3.56^{\dagger}	
		(1.98)			(1.88)	
Denial*Similar Recalls		0.49			0.49	
		(1.31)			(1.90)	
Excuse*Similar Recalls		-0.02			-0.02	
		(1.55)			(1.82)	
Justification*Similar Recalls		2.03			2.03	
Apology*History		(1.28)	22.86		(1.42)	22.86
Apology History			(27.71)			(30,30)
Denial*History			89.12*			89.12*
Domai Mistory			(41.54)			(40.94)
Excuse*History			16.85			16.85
			(28.39)			(36.59)
Justification*History			-9.33			-9.33
-			(43.95)			(52.30)

 Table 5 (cont'd)

n = 209*** p < .001; ** p < .01; * p < .05; † p < .10Standard errors are in parentheses.

	GEE Models			OLS Models		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	-1728.35	-2003.60	-1612.51	-1728.35	-2003.60^{\dagger}	-1612.51
	(1107.85)	(1250.94)	(1085.94)	(1174.54)	(1190.38)	(1213.00)
Controls						
Firm sales (lagged)	1.12^{***}	1.12^{***}	1.11^{***}	1.12^{***}	1.12^{***}	1.11^{***}
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Firm size	-0.05***	-0.05^{***}	-0.05***	-0.05**	-0.05**	-0.05^{**}
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Firm employees	-12.85*	-12.66 [†]	-10.67	-12.85*	-12.66 [†]	-10.67
	(6.39)	(6.50)	(6.85)	(6.46)	(6.56)	(6.98)
Firm R&D expenditures	7.41***	7.58^{***}	8.19***	7.41***	7.58^{***}	8.19**
	(2.18)	(1.99)	(2.23)	(1.97)	(1.91)	(2.46)
Firm diversification	-267.37	-166.98	-213.04	-267.37	-166.98	-213.04
	(428.82)	(429.76)	(421.32)	(490.62)	(495.29)	(492.24)
Firm reputation	544.07	349.14	364.55	544.07	349.14	364.55
	(497.40)	(461.16)	(481.30)	(588.80)	(556.17)	(583.97)
Industry recalls	-0.68	-0.45	-0.82	-0.68	-0.45	-0.82
	(1.68)	(1.81)	(1.69)	(1.94)	(2.04)	(1.93)
Industry dynamism	1603.07	792.46	1908.34	1603.07	792.46	1908.34
	(3554.92)	(3531.11)	(3558.18)	(3494.99)	(3742.59)	(3357.70)
Industry munificence	-885.76	-709.41	-1078.34	-885.76	-709.41	-1078.34
	(1208.71)	(1194.49)	(1333.51)	(1353.45)	(1374.65)	(1440.47)
Press release lag time	-2.98	-0.63	2.67	-2.98	-0.63	2.67
	(6.27)	(6.63)	(6.15)	(7.69)	(7.77)	(7.33)
Year dummy variables	included	included	included	included	included	included
Quarter dummy variables	included	included	included	included	included	included
Recall characteristics						
Recall severity	70.14	33.66	151.24	70.14	33.66	151.24
·	(349.51)	(318.24)	(371.11)	(349.90)	(340.47)	(359.94)
Frequency of similar recalls (5 yrs)	-0.74	-1.56	-0.73	-0.74	-1.56	-0.73
	(0.57)	(1.17)	(0.56)	(0.78)	(1.41)	(0.80)
Firm recall history (5 yrs)	0.42	3.98	-62.66	0.42	3.98	-62.66
	(19.61)	(20.03)	(41.75)	(21.68)	(21.26)	(46.08)

Table 6 – Five-Year Firm History and Similar Recall History Interacti	ons
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		(
Involvement of others on recall	-413.32 [†]	-410.56^{\dagger}	-508.89^{*}	-413.32	-410.56	-508.89
	(239.06)	(233.40)	(248.03)	(314.10)	(318.13)	(324.65)
Firm responses						
Apology	-270.12	-161.17	-296.72	-270.12	-161.17	-296.72
	(289.81)	(283.84)	(297.79)	(371.76)	(353.39)	(381.26)
Denial	-581.10	-441.07	-629.25^{\dagger}	-581.10	-441.07	-629.25
	(401.39)	(346.96)	(371.32)	(462.46)	(478.14)	(448.84)
Excuse	272.76	312.73	126.82	272.76	312.73	126.82
	(363.00)	(354.81)	(350.97)	(364.96)	(357.83)	(369.65)
Justification	691.03^{*}	646.00^{*}	580.50^*	691.03^{*}	646.00^{\dagger}	580.50^{\dagger}
	(295.01)	(306.21)	(254.78)	(343.04)	(345.11)	(322.82)
Interactions						
Apology*Similar Recalls		3.78^{\dagger}			3.78^{\dagger}	
		(2.11)			(2.02)	
Denial*Similar Recalls		1.11			1.11	
		(0.98)			(1.60)	
Excuse*Similar Recalls		-0.88			-0.88	
		(1.66)			(1.81)	
Justification*Similar Recalls		0.25			0.25	
		(1.24)			(1.34)	
Apology*History			-10.42			-10.42
			(33.14)			(38.10)
Denial*History			64.50^{\dagger}			64.50^{*}
			(32.92)			(32.58)
Excuse*History			-3.06			-3.06
			(21.68)			(31.66)
Justification*History			47.27			47.27
			(32.79)			(40.77)

Table 6 (cont'd)

n = 163*** p < .001; ** p < .01; * p < .05; † p < .10Standard errors are in parentheses.

	DV: Four	Quarters	DV: Single Quarter		
	GEE	OLS	GEE	OLS	
	Model 1	Model 2	Model 3	Model 4	
Recall characteristics					
Recall severity	457.46	457.46	213.98^{\dagger}	213.98^{\dagger}	
-	(386.90)	(325.30)	(127.47)	(117.44)	
Frequency of similar recalls	-1.89*	-1.89^{\dagger}	-0.03	-0.03	
	(0.82)	(1.14)	(0.31)	(0.37)	
Firm recall history	47.51	47.51	6.22	6.22	
	(36.68)	(34.44)	(8.61)	(11.42)	
Involvement of others on recall	-489.02^{*}	-489.02^{\dagger}	-95.90	-95.90	
	(241.12)	(272.47)	(66.03)	(90.22)	
Firm responses					
Apology	8.08	8.08	6.27	6.27	
1 00	(342.15)	(377.52)	(86.94)	(109.01)	
Denial	-626.41 [†]	-626.41	-77.27	-77.27	
	(352.84)	(390.30)	(88.02)	(99.11)	
Excuse	-77.53	-77.53	-54.37	-54.37	
	(255.78)	(302.89)	(129.25)	(132.73)	
Justification	617.86*	617.86 [†]	89.89	89.89	
	(290.07)	(314.99)	(91.16)	(90.64)	
Interactions					
Apology*Severity	137.34	137.34	-41.04	-41.04	
	(501.06)	(662.82)	(175.46)	(212.30)	
Denial* Severity	621.41	621.41	183.15	183.15	
	(732.06)	(656.55)	(204.61)	(217.63)	
Excuse* Severity	-595.90	-595.90	-13.70	-13.70	
,	(498.78)	(598.46)	(230.30)	(250.75)	
Justification* Severity	-116.49	-116.49	-80.88	-80.88	
Ş	(419.94)	(588.17)	(184.27)	(214.61)	
Apology*Similar Recalls	3.95	` 3.95 [†]	-0.16	-0.16	
1 00	(2.76)	(2.36)	(0.65)	(0.64)	
Denial*Similar Recalls	1.58	1.58	0.90	0.90	
	(1.74)	(2.66)	(0.71)	(0.84)	
Excuse*Similar Recalls	0.74	0.74	-0.77	-0.77	
	(1.96)	(2.41)	(0.92)	(0.90)	
Justification*Similar Recalls	2.63	2.63	2.07**	2.07**	
	(1.77)	(1.95)	(0.73)	(0.70)	

 Table 7 – Comparing Four-Quarter and Single-Quarter Firm Sales Dependent Variables

Apology*History	119.80***	119.80*	6.67	6.67
1 00 0	(34.44)	(54.91)	(13.45)	(29.67)
Denial*History	39.06	39.06	2.48	2.48
-	(43.24)	(49.85)	(12.48)	(20.89)
Excuse*History	55.32^{*}	55.32	-15.98	-15.98
	(25.04)	(47.33)	(23.30)	(20.58)
Justification*History	56.99	56.99	49.47	49.47
	(60.60)	(75.64)	(36.97)	(35.86)
Apology*Involvement	380.70	380.70	44.04	44.04
	(815.81)	(709.24)	(163.37)	(200.93)
Denial* Involvement	-52.74	-52.74	60.04	60.04
	(542.21)	(688.89)	(177.94)	(215.89)
Excuse* Involvement	428.79	428.79	-106.62	-106.62
	(546.78)	(576.86)	(172.77)	(217.14)
Justification* Involvement	908.06^{\dagger}	908.06	24.49	24.49
	(538.22)	(611.31)	(152.09)	(183.54)

Table 7 (cont'd)

n = 226

*** p < .001; ** p < .01; * p < .05; † p < .10Standard errors are in parentheses. Control variables excluded from table to save space.

	GEE	Models	OLS Models		
	Model 1	Model 2	Model 3	Model 4	
Intercept	1684.93*	1357.01 [†]	1684.93*	1357.01 [†]	
-	(699.83)	(727.15)	(763.59)	(799.80)	
Controls					
Firm sales (lagged)	1.06^{***}	1.06^{***}	1.06^{***}	1.06^{***}	
	(0.02)	(0.02)	(0.02)	(0.02)	
Firm size	-0.03**	-0.03**	-0.03*	-0.03^{*}	
	(0.01)	(0.01)	(0.01)	(0.01)	
Firm employees	-0.87	-0.30	-0.87	-0.30	
	(2.92)	(3.04)	(2.92)	(3.08)	
Firm R&D expenditures	0.52	0.50	0.52	0.50	
	(0.55)	(0.48)	(0.65)	(0.57)	
Firm diversification	-109.35	24.87	-109.35	24.87	
	(319.93)	(286.06)	(383.64)	(390.44)	
Firm reputation	249.92	436.66	249.92	436.66	
	(571.06)	(601.99)	(549.67)	(659.55)	
Industry recalls	-0.49	-0.17	-0.49	-0.17	
	(1.27)	(1.37)	(1.76)	(1.69)	
Industry dynamism	1310.73	971.25	1310.73	971.25	
	(2477.37)	(2330.04)	(2474.36)	(2522.71)	
Industry munificence	-1176.65	-1066.60	-1176.65	-1066.60	
	(1112.35)	(1143.68)	(1076.53)	(1074.59)	
Press release lag time	-9.43	-10.40	-9.43	-10.40	
	(6.19)	(6.69)	(6.16)	(6.53)	
Year dummy variables	included	included	included	included	
Quarter dummy variables	included	included	included	included	
Recall characteristics					
Recall severity	516.76	481.19	516.76^{\dagger}	481.19	
2	(395.20)	(383.86)	(309.18)	(318.29)	
Frequency of similar recalls	-1.50 [†]	-1.84 [†]	-1.50	-1.84 [†]	
	(0.82)	(0.94)	(1.08)	(1.11)	
Firm recall history	52.54	51.12	52.54	51.12	
-	(38.22)	(39.94)	(34.79)	(38.27)	
Involvement of others on recall	-527.05 [†]	-589.63 [*]	-527.05	-589.63*	
	(271.14)	(288.94)	(286.66)	(296.93)	

Table 8 – Effects of	Combination	Responses
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Table 8 (cont'd)

Combination firm responses		
Apology*Denial	-1662.09^{\dagger}	-1662.09^{\dagger}
	(862.13)	(938.90)
Apology*Excuse	-361.25	-361.25
	(391.13)	(546.69)
Apology*Justification	1313.81*	1313.81*
	(554.73)	(615.50)
Denial*Excuse	621.16	621.16
	(625.87)	(707.28)
Denial*Justification	146.86	146.86
	(313.00)	(458.14)
Excuse*Justification	-177.32	-177.32
	(463.03)	(491.36)

n = 226*** p < .001; ** p < .01; * p < .05; † p < .10Standard errors are in parentheses.

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