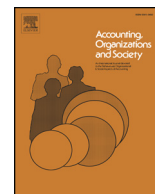




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ABSTRACT

I examine how firm-investor communications on social media affect investors' perceptions of the firm. I focus on a case in which a Twitter user criticizes a discretionary accrual adjustment and management chooses whether and how to respond. I collect data using multiple experiments in which I vary the perceived validity of a criticism via the number of retweets it receives and/or the firm's response. Results suggest that the influence the criticism has on nonprofessional investors' perceptions depends on the number of times it has been retweeted. Results also suggest that following a criticism perceived to be valid, there are benefits of addressing the criticism directly or of redirecting attention to a positive highlight from the firm disclosure (relative to not responding). The findings advance our understanding of how a firm can effectively manage investors' perceptions by participating in, rather than abstaining from, conversations about the firm on social media.

1. Introduction

Social media is characterized by the dynamic two-way exchange of user-generated content (Kaplan & Haenlein, 2010). As such, social media offer those capital market participants who have no direct line to management the ability to publicly voice questions and interact in ways that give managers incentives to take action (Elliott, Grant, & Hobson, 2018). In 2014, the Securities and Exchange Commission (SEC) approved firms' use of social media to release and discuss financial information (SEC, 2013; 2014). Because it remains unclear whether and how firms should interact with constituents who voice their concerns on social media, more firms are experimenting with social media in an effort to develop best practices (Joyce, 2013). In this paper, I investigate how firm-investor communications on social media affect investors' evaluations of the firm as an investment and the firm's reputation.

Examining how investors judge communications on social media is important for several reasons. First, social media differ from traditional

media—such as press releases and company websites—in that social media promote public *two*-way interactions in which firm managers do not have complete control over what is said about their firms (Miller & Skinner, 2015). Thus, what we know about investors' reactions to corporate disclosures from existing research may not generalize to investors' reactions in today's evolving information environment. Second, recent archival research has demonstrated the relevance of social media activity for security prices (Curtis, Richardson, & Schmardebeck, 2016; Lee, Hutton, & Shu, 2015), for returns (Chen, De, Hu, & Hwang, 2014), and for information asymmetry (Blankespoor, Miller, & White, 2014). As individuals continue to increase their reliance on social media for firm-level news and investment advice, firms that fail to participate in the conversation are likely to be noticed for their silence (e.g., Apple, Facebook, and Google (PR Newswire, 2015)). Third, public relations agencies have expressed concerns about the risk that social media pose to corporate reputations (e.g., Accenture, 2014) and empirical evidence links reputational capital to firm value (e.g., Chakravarthy, deHaan, & Rajgopal, 2014). Because many companies are not yet confident or

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adept at using social media (Investis, 2015), managers and investors could benefit from a better understanding of the consequences of various social media strategies.

To examine my research question, I collect data using multiple experiments in which I measure nonprofessional investors' reactions to the activity around an earnings announcement on *Twitter.com*, a social media platform that allows users to broadcast short, text-based posts called *tweets* (Appendix A provides an example). Although all participants view the same firm-directed criticism, I manipulate between participants a signal of the validity of this criticism as well as the firm's reaction—namely, whether the firm (1) abstains from the conversation, (2) publicly provides an explanation for why the criticism is undeserved, or (3) attempts to redirect investors' attention to a positive highlight from its original disclosure.

The experimental method is desirable in examining my research question. For example, as opposed to attempting to identify specific perceptions using observed stock price changes, an experiment allows me to measure these perceptions directly and independently. I can also hold constant factors such as disclosure characteristics, which prior research demonstrates influence these perceptions. Further, in the real world, the quality of the criticism and the signal of its validity are likely endogenous, making it difficult to disentangle investors' reliance on one versus the other. By taking an experimental approach, I isolate the effect of this signal on investors' perceptions of a criticism's quality, independent of the *actual* quality of the criticism.

To develop my theoretical framework, I apply the *Persuasion Knowledge Model* (Friestad & Wright, 1994) from the field of consumer behavior. This model outlines how consumers use their knowledge of persuasion motives and tactics to interpret, evaluate, and react to marketers' influence attempts. As consumers of corporate disclosures, I expect investors to use their understanding of firms' and of other investors' motives, information sharing strategies, and persuasion tactics to decide how much to rely on a given criticism when evaluating the firm.

First, because investors are motivated to accurately assess the validity of the criticism, they should be receptive to information that helps them achieve this goal (Friestad & Wright, 1994). For example, if the criticism does not come from a trusted source, investors—sensitive to the critic's motive to persuade—will seek out other cues regarding the criticism's validity. Given prior research demonstrating individuals' tendency to use consensus as a cue for correctness (Axsom, Yates, & Chaiken, 1987), I propose that one such cue nonprofessional investors may use is the number of times the criticism has been reposted and forwarded to additional users. On Twitter, the reposting of someone else's tweet is called *retweeting*. As a result, the influence a firm-focused criticism has on these investors' evaluations of the firm should increase with the number of times the criticism has been retweeted.

Next, because an explanation provides additional, relevant information for assessing the criticism, management could have some success in mitigating the criticism's damage by providing a reasonable explanation for why it is undeserved. In contrast, repeating a positive highlight from the firm's disclosure does not directly inform investors about the validity of the criticism. Instead, investors may interpret this type of response either as a negative signal about the criticized act (e.g., the firm has no acceptable explanation) or as a positive signal about the criticized act (e.g., that the criticism is not worthy of an explanation). While the former interpretation would exacerbate the criticism's damage, the latter would have a mitigating effect.

My primary experiment uses a 2×3 (number of retweets: few or many \times firm response strategy: no response, explanation, or redirection) + 1 (control: no criticism, no firm response) between-participants design. Participants take the role of a current investor in a firm and follow the related Twitter activity for the firm's current quarter earnings announcement. Results suggest that (i) simply viewing a criticism can harm nonprofessional investors' perceptions of a firm as an investment as well as their perceptions of the firm's reputation, and (ii) when the

firm remains silent after a criticism, the damage caused increases in the number of times the critical tweet has been retweeted. Results also suggest that *either* providing an explanation or attempting to redirect attention after a criticism gains traction helps to mitigate, but does not fully eliminate, the criticism's negative effect on nonprofessional investors' evaluations of the firm.

Analysis of post-experimental measures suggests that although both explaining and redirecting might appear comparable on some dimensions, participants do report being more likely to *like* and more likely to *retweet* a firm's explanation than its redirection tweet. Further, when participants are given a chance to evaluate all three strategies side-by-side, they report a strong preference first for the explanation, followed by the redirection, and then no response. This rank-ordering is consistent with the between-participants results for the key dependent measures, which suggests that participants are aware that they value both active responses more than they value the choice to remain silent (Kahneman & Tversky, 1996; Libby, Bloomfield, & Nelson, 2002).

Altogether, results suggest that although nonprofessional investors may prefer an explanation if one is known to be available, a redirection can still mitigate damage both when viewed in isolation and when investors explicitly consider not responding as an alternative strategy. To further explore this favorable reaction to the redirection strategy, I conduct additional experimentation in which participants take the role of *prospective*, instead of *current*, investor. I find that prospective investor-participants continue to favor a firm's redirection over no response, suggesting that motivated reasoning (Kunda, 1990)—an unconscious bias—cannot fully explain the original finding. I also find that the positive signal investors take from the redirection is at least partially determined by its source, not merely its content, as participants do *not* appear to favor the redirection over no response if the redirection comes from an unfamiliar source instead of from the firm.

My study makes several contributions. First, I extend the voluntary disclosure literature, which has dealt primarily with firms' unidirectional disclosure practices. In contrast to the extant literature, I investigate investors' perceptions of *bidirectional* firm-investor communications.¹ Indeed, the uncontrolled and public nature of social media has moved firms closer to a truer two-way model of communication in which firm managers feel additional pressure to publicly engage with all types of constituents. I provide evidence that firms can benefit by participating in, rather than abstaining from, conversations about the firm on social media. My results also suggest that capital market benefits exist even if a manager does not *directly* respond to a specific grievance, but instead responds by redirecting attention to something positive. It will be important for researchers to take these benefits into consideration as we adapt the voluntary disclosure literature to incorporate recent changes to the information environment (Miller & Skinner, 2015).

Second, my study complements and extends the small but growing literature exploring the importance of new media for capital market participants' perceptions and behavior. Most closely related to my study, Lee et al. (2015) use archival data to document (i) an association between the frequency of outsider tweets around a product recall announcement and the related negative stock price reaction, and (ii) an association between the frequency of tweets from the firm and the attenuation of this negative reaction. My study complements Lee et al. (2015) in that I experimentally manipulate a firm's response strategy to draw inferences about the effects of *how* a firm chooses to handle

¹ Research on the question and answer portion of earnings conference calls provides one exception in the extant literature. However, the social media setting and the conference call setting are fundamentally different due to the expectations and incentives of the communicators involved. For example, whereas firm managers can exert some influence over professional analysts' behavior (Feng & McVay, 2010) and can have some success in filtering the questions that are asked during these calls (Mayew, 2008), managers are unlikely to have the same influence over the non-affiliated analysts and investors who interact and provide financial advice online for public consumption.

negative attention online. In contrast, Lee et al. (2015) treat all firm posts as interchangeable, thereby restricting their inferences to the effects of *how much* a firm tweets. Overall, my study provides unique insights into the consequences of various two-way disclosure practices and introduces to the literature a new and increasingly relevant determinant of perceived validity, retweet count. Although I focus on retweets at the operational level, my results should generalize to alternate determinants of perceived validity within social media as well—e.g., source credibility or additional public discussion of a post.

My study also has practical implications. In adapting corporate disclosure practices to an information environment that embraces social media, firm managers need to know more about how investors react to two-way disclosure practices online. By investigating the implications of firm-investor communications on Twitter for investors' perceptions, I assist firm managers in their development of social media best practices.

The following section discusses relevant background information and develops my hypotheses. Section 3 presents the design for my primary experiment. Section 4 presents the results of my hypotheses tests, related supplemental analyses, and additional experimentation intended to further examine the redirection strategy's benefits. Section 5 concludes.

2. Background and hypothesis development

2.1. What makes social media unique?

Social media have several characteristics that create a richer disclosure channel relative to more traditional media (Daft & Lengel, 1984; 1986). First, social media websites and applications such as Facebook, LinkedIn, Twitter, and YouTube make it possible for anyone with access to the Internet to publicly broadcast her opinions of a firm's operations, predictions of future stock price changes, or decisions to trade. That is, in addition to facilitating information dissemination, social media platforms provide capital market participants an opportunity to publicize how they process information. On [Twitter.com](https://twitter.com), for example, a user identified by her username (@username) can publish her opinions, predictions, and decisions in a post of 140 characters or fewer called a *tweet*. Each tweet is shared immediately with the tweeter's *followers* (i.e., other Twitter users who have opted-in to receiving all of her tweets) and is publicly available via Twitter's search function. This search function allows interested investors with and without a Twitter account to easily access, without preapproval, all posts related to a specific topic or publicly traded company.

Second, social media promote public two-way communication—both among individuals and between individuals and firms. Although not being able to control what others say about a firm on social media can be quite threatening, social media can also provide new cues that help managers understand the demands of market participants. For example, when a manager receives a question from an analyst on a conference call, it is difficult to know whether other market participants also believe the question is important, which would be helpful information to have when deciding how to respond. In contrast, when an individual discusses a firm on social media, there is an abundance of additional information about others' views on the matter—e.g., the extent to which other users engage with the post by *liking* it, reposting it, or responding to it. Together, these unique features make social media ripe for influencing others' perceptions of a firm in new and unexplored ways (Miller & Skinner, 2015; Saxton, 2012).

2.2. Corporate use of Twitter

In addition to individuals (e.g., @ElonMusk, 19.1M followers), many traditional news outlets and other businesses create Twitter accounts that bear their organization's name (e.g., @Starbucks, 11.9M followers). Businesses generally use Twitter to connect with customers,

advertise sales, and present or discuss financial performance. Firm tweets regarding earnings announcements often direct viewers to company websites or to press releases (Jung, Naughton, Tahoun, & Wang, 2017). When firm tweets include unique content, they frequently highlight points from a press release or share direct quotes from a firm's earnings conference call. An example of a more innovative use of Twitter for investor relations purposes is Ford Motor Company's presence on [StockTwits.com](https://stocktwits.com), a website dedicated to financially oriented tweets. Ford's Chief Financial Officer, Robert Shanks (via @Ford, 1.08M followers), has conducted question and answer sessions with the broader investor community using [StockTwits.com](https://stocktwits.com) following at least six of Ford's recent quarterly earnings releases.²

Recent archival research investigating the association between corporate Twitter activity and capital market activity suggests that firms' Twitter use can impact stock prices, returns, liquidity, and information asymmetry (e.g., Bartov, Faurel, & Mohanram, 2017; Blankespoor et al., 2014; Chen, Hwang, & Liu, 2017; Lee et al., 2015). Recent research conducted in the laboratory also provides evidence that (i) investment advice, even advice with little predictive value, can influence investors when delivered on Twitter (Kadous, Mercer, & Zhou, 2017), and (ii) whether a firm discloses information via Twitter or via more traditional channels appears to matter for investors' perceptions and behavior (Elliott, Grant, & Hodge, 2018; Guggenmos & Bennett, 2017). Consistent with a growing appreciation for the relevance of Twitter for investors' perceptions, by the third quarter of 2014, 84 percent of sampled U.S. firms had a corporate Twitter account and, in a global sample, 70 percent of firms with corporate accounts had a history of tweeting investor relations content (Investis, 2015).³ Although firms' current use of Twitter provides some insights into how investors react to indirect and direct engagement with constituents' concerns, these insights are limited by the absence of *ceteris paribus* comparisons. To better understand the consequences of various social media practices, I use a controlled setting to separately measure investors' reactions to the highlighting of a point from a press release and to the provision of an explanation following a criticism published on Twitter.

2.3. Hypothesis development

From research on consumer behavior, the *Persuasion Knowledge Model* proposes that consumers develop knowledge about marketers' motives, strategies, and tactics, and use this knowledge together with their knowledge of the relevant topic (e.g., a product) and of the agent (i.e., the marketer itself) to cope with a given persuasion attempt (Friestad & Wright, 1994). For example, after identifying a persuasion tactic in an advertisement—like the use of a spokesperson that appears similar to the target audience—consumers may respond by discounting the information provided within the advertisement and refining their attitudes towards the marketed product and the marketers themselves. As consumers of corporate disclosures, investors are likely to develop analogous topic, agent, and persuasion knowledge—i.e., knowledge about firms' motives, disclosure strategies, and persuasion tactics, as well as knowledge about other investors' motives, information sharing strategies, and persuasion tactics.

2.3.1. The social science of social media: a role for retweets

When an investor views a firm-directed criticism on Twitter, she

² Although Ford is currently the only major company to date to facilitate a complete question and answer session on [StockTwits.com](https://stocktwits.com), many companies use Twitter to solicit questions from the broader investment community and then reference a selection of these questions on their conference calls (e.g., @FedEx, 267K followers). More widespread adoption of these practices seems likely in light of recent research documenting the capital market benefits of offering a direct line to management via investor relations activities generally (Bushee & Miller, 2012) and via social media specifically (Elliott, Grant, & Hodge, 2018).

³ The Investis (2015) review includes all companies in the Dow Jones Industrial Average, S&P 100, NYSE US 100, NASDAQ 100, FTSE 100, and FTSE 250.

will rely on her topic, agent, and persuasion knowledge to help her decide how valid the criticism is and how much to update her opinions about the firm. If the investor is limited in her ability to directly assess the validity of a criticism (i.e., if she has limited *topic* knowledge) and does not already trust the source of that criticism to provide accurate information (i.e., if she has limited *agent* knowledge), she will turn to her persuasion knowledge for help assessing the likely validity of the critic's assertion. That is, sensitive to the critic's motive to persuade, the investor will seek out cues to help diagnose the validity of the criticism. I posit that the number of times the criticism has been retweeted provides one such cue.⁴

Individuals *retweet*—i.e., repost—tweets for various reasons, which can depend on the retweeter, the tweet's content or context, etc. A survey asking Twitter users about their general practices reveals that the three most common motivations for retweeting content are to share relevant information, to show agreement, and to show support, while less common motivations include to participate in promotions, to initiate a conversation, and to reciprocate another retweet (Recuero, Araujo, & Zago, 2011). Boyd, Golder, and Lotan (2010) present corroborating survey evidence—reporting that people retweet content to amplify or spread tweets to new audiences, to publicly agree with someone, and to validate others' thoughts.

If being retweeted is one way to enhance the perceived validity of a tweeted message, then the greater the number of retweets, the bigger the impact on investors' perceptions and behavior. I expect this retweet/perceived validity relation exists given (i) the survey evidence described above and (ii) theory that suggests individuals perceive consensus as a cue for correctness (Axsom et al., 1987; Cialdini & Goldstein, 2004; Eagly & Chaiken, 1993).⁵ In a corporate disclosure setting, if investors view a criticism with few (many) retweets as being less (more) valid, then the damage to investors' perceptions of a firm should be increasing in the number of retweets a firm-directed criticism receives. Hence, I propose the following hypothesis:

H1: Absent any firm response, nonprofessional investors evaluate a firm as an investment less favorably as the number of retweets a firm-directed criticism receives increases.

2.3.2. Participating in the conversation on social media: explanation or redirection

Firm managers would of course prefer that investors believe a given criticism is not valid. Thus, when evaluating any firm response, investors should appreciate that the firm is acting with a motive to persuade. However, because investors naturally wish to form valid attitudes about the firm (Friestad & Wright, 1994), they should be receptive to additional information that appears to help them achieve this goal. Thus, I posit that a firm can regain investor confidence following a damaging criticism by addressing that criticism directly. Indeed, prior literature in psychology, management, and accounting suggests that open communication and helping individuals make sense of negative events can temper the adverse effects of these events (Elliott, Hodge, & Sedor, 2012; Korsgaard, Brodt, & Whitener, 2002; Whitener, Brodt, Korsgaard, & Werner, 1998). In the corporate disclosure setting, a reasonable explanation for why a criticism is undeserved should alter an investor's understanding of the criticized act

⁴ If the criticism does come from a trusted, credible source, I expect there would be little need for the investor to seek out additional validity cues. Instead of directly examining source credibility as it relates to the initial criticism, I broaden my contribution by investigating the subtler, less-studied retweet count. In doing so, I provide inferences that should generalize to source credibility as well as to other, subtler cues of validity at the construct level.

⁵ I contend that nonprofessional investors view retweets as a *cue* for a tweet's validity, independent of its *actual* validity. Under what circumstances retweets are and are not predictive of actual validity remains an outstanding empirical question—the answer to which would help inform when using retweets as a cue for correctness is a rational, fruitful practice.

Investment Judgments (predicted)

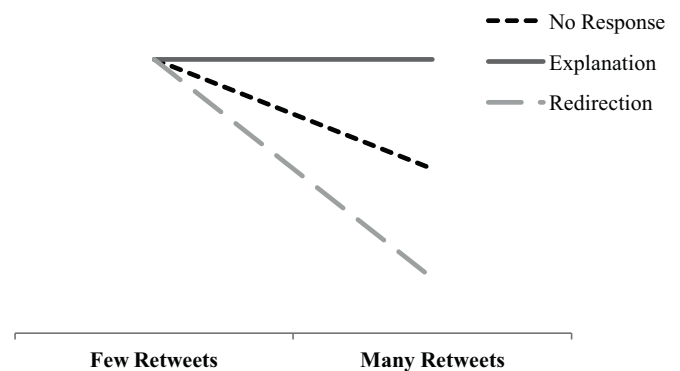


Fig. 1. Predicted effects of criticism retweet count and firm response strategy on investment judgments (H1, H2, & H3).

Fig. 1 illustrates my hypotheses concerning judgments of an investment in the experimental firm. In my experiment, I manipulate the number of retweets a criticism receives (Few or Many) and a firm's strategy for handling negative attention on Twitter (No Response, Explanation, or Redirection). The black dotted line depicts H1, reflecting my expectation that in the absence of a response from the firm, investors will evaluate the firm less favorably as the number of retweets a firm-focused criticism receives increases. Together, all points in the figure depict the interactions stated in H2 and H3—that providing an explanation in response to a criticism has a more positive effect when that criticism has been retweeted many (relative to few) times (H2), but that attempting to redirect attention to a positive highlight has a more *negative* effect when the criticism has been retweeted many (relative to few) times (H3).

and work towards unwinding any related negative thoughts about the firm (Barton & Mercer, 2005; Heider, 1958; Kelley, 1967).⁶

As hypothesized in H1, a firm-focused criticism that has been retweeted many times should cause greater damage than one that has been retweeted only a few times. Although it would not appear unusual for a manager to respond to a perceived-to-be *valid* criticism by providing an explanation, the same explanation may raise a red flag when issued in response to a criticism that does not appear valid on its face. In this latter case, investors might interpret the firm's provision of an explanation as a negative signal—e.g., that the criticized act is a bigger deal than initially thought or that management has time to waste on small issues. This negative signal would then work to counteract the explanation's positive effects discussed above. Together, the positive effects of providing a reasonable counter-explanation to the criticism should be greater when the criticism has been retweeted many (relative to few) times. Thus, I propose the following hypothesis (depicted by the dotted black and solid grey lines in Fig. 1):

H2: When a criticism has been retweeted many times, a firm-provided explanation *improves* nonprofessional investors' evaluations of the firm as an investment, but this improvement is smaller when the criticism has only been retweeted a few times.

Alternatively, when a firm with a persuasion motive chooses not to provide an explanation, but instead attempts to redirect attention to something positive, investors' initial reactions to the criticism could be intensified. Redirecting attention is fundamentally different from providing an explanation because it does not directly provide additional information that would help investors interpret the initial disclosure or

⁶ Although the potential benefits of providing an explanation in response to a criticism may appear intuitive, it is possible that doing so could backfire in this setting. That is, investors may not view Twitter as an appropriate platform for firms to respond in this manner (Fournier & Avery, 2011), which could influence the way investors react to firm tweets. Whether the benefits of providing an explanation outweigh any costs associated with being perceived as violating corporate tweeting norms is an empirical question—one I inform with this study.

diagnose the validity of the criticism. Instead, investors may classify a firm's attempt to redirect attention as a persuasion tactic—e.g., an attempt to distract from the criticism—and interpret the reliance on such a tactic as a signal that no good explanation exists. This interpretation would add validity to the initial criticism by reinforcing the cue investors take from the criticism when the firm remains silent, harming investors' perceptions of the firm as a result.

I further expect that, relative to criticisms originally perceived to be less valid, criticisms originally perceived as *more* valid will invoke a stronger negative reaction because individuals are more likely to believe a valid criticism deserves a direct response. Thus, I propose the following hypothesis (depicted by the dotted black and dashed grey lines in Fig. 1):

H3: When a criticism has been retweeted many times, a firm's attempt to redirect attention *harms* nonprofessional investors' evaluations of the firm as an investment, but this harm is smaller when the criticism has only been retweeted a few times.

After analyzing the results of my primary experiment, I recognize there is equally compelling theory to suggest that a strategy of redirection could *benefit* the firm. Specifically, if investors do not classify this strategy as a tactic, but instead interpret it as a positive signal either about the criticized act (e.g., that the criticism is not serious enough to warrant a response) or about the firm (e.g., that at least the firm cares enough to be involved), redirecting attention could actually mitigate the effect of the criticism on investors' perceptions. To stay true to the scientific method, I formalize H3 as I predicted *ex ante* (Kerr, 1998). However, in Section 4.5, I present and discuss the results of additional experimentation designed to investigate this alternative perspective.

3. Experimental design and method

3.1. Participants

Five-hundred-fifty-eight U.S. workers from Amazon.com's Mechanical Turk (MTurk) online marketplace complete my study.⁷ To form a sample of nonprofessional investors, only MTurk workers who indicate they have previously invested in the stock market and previously read a financial statement are allowed to participate. On average, qualifying participants are 35 years old, have between nine and 12 years of full-time work experience, and have taken 1.5 accounting and 1.5 finance courses.

The behavior of my sample participants should generalize to the broader population of nonprofessional investors with some knowledge of financial statements. First, having previously invested implies that each participant considers herself *to be* an investor, indicating that each considers herself to be representative of the population to which I wish to generalize. Second, having previously read a financial statement signals that each participant is at least somewhat familiar with accounting information, a necessary condition for understanding the case materials. Third, Farrell, Grenier, and Leiby (2017) demonstrate that online laborers exert effort equal to or in excess of other populations when faced with accounting-research focused tasks, suggesting that each participant is likely to take the task seriously, as an investor would.

⁷ To confirm the replicability of my findings and to increase the power of my statistical tests, MTurk workers from the same population participated in each of two separate data collection sessions spaced one year apart. I included an additional screen in the second session to ensure no single individual was able to participate in both sessions. These two sessions produce sample participants that are qualitatively similar. Neither data collection date nor its interaction with my independent factors are significant when entered as covariates into reported analyses. Because there are no notable differences, I present all summary statistics and analyses after pooling across collection dates.

3.2. Research design and procedures

For the purpose of testing my hypotheses, I collect data using a 2×3 (number of retweets: few or many \times firm response strategy: no response, explanation, or redirection) + 1 (control: no criticism, no firm response) between-participants experiment. Participants randomly assigned to one of these seven conditions assume they are currently invested in a hypothetical company, read its earnings press release, follow the relevant Twitter activity surrounding its release, and answer various investment-related questions. To ensure participants attend to the details within my research instrument, I inform them that they will earn a flat wage for taking the time to participate in my study and could earn additional compensation based on their ability to correctly answer questions about various details of the case materials.⁸

After informing participants of these general procedures, I introduce participants to Deluxe Snacks, Inc., a hypothetical firm in the snack food industry. I have participants assume they own 500 shares of the company's stock because current investors should naturally be interested in a firm's earnings and related Twitter activity. The first tweet participants view is from the company itself. This tweet provides a link to the company's quarterly earnings press release, which participants are required to click on before advancing. On the same screen, participants view a tweet from a news source, which informs them that the company's earnings per share of \$1.30 has beat the analyst consensus forecast of \$1.28. Appendix B presents a timeline of the experimental procedures and illustrates the manipulated parts of the experimental instrument, as discussed below.

3.3. Retweet manipulation

After participants open the press release, they advance to a screen that displays an additional tweet authored by a person unrelated to the firm. This additional tweet highlights a large decrease in the company's selling, general, and administrative expenses (SG&A), quarter over quarter. Further, the additional tweet cites a large decrease in the company's bad debt allowance as the reason for this change in SG&A and suggests that without this decrease, the company would not have beat the analyst consensus forecast.

I manipulate the number of retweets the criticism receives via the retweet count on the face of the tweet: one (Few) or 126 (Many). The critical tweet is timestamped as having been posted 14 min ago to help ensure that participants interpret one retweet as a consequence of the tweet itself and not simply that Twitter users had not had sufficient time to retweet it (Bray, 2012; Ferrara & Yang, 2015; Macskassy & Michelson, 2011; Recuero et al., 2011). Analogously, I operationalize Many Retweets at a number over 100 to avoid ambiguity about the significance of the number of retweets. Supporting this design choice, Ferrara and Yang (2015) report that the average number of retweets was just over 100 for a subsample of tweets that had been retweeted at least once and for which they consider to communicate negative sentiment (analogous to the criticism in my experimental case).

3.4. Response strategy manipulation

Whereas the content of the company's initial tweet and of the criticism is the same for every participant, the full set of company tweets varies

⁸ Participants spent an average of 14.2 min completing the study and correctly answered an average of 2.7 of 3 bonus questions, indicating that participants were generally paying attention and putting forth effort. In the first (second) data collection session, participants earned a flat wage of \$1.50 (\$1.00) for completing the study and an additional \$0.50 (\$0.25) for each correctly-answered bonus question. After learning I had overpaid participants relative to MTurk norms in the first data collection session (what equated to a \$12.04 hourly wage), I reduced the amount participants could earn in the second session to avoid again over-paying. Neither time spent completing the study nor performance on the bonus questions differed significantly across data collection sessions.

across the three strategy conditions. In the No Response conditions, participants observe no further communication from the company. In these conditions, participants view the same three tweets again, this time with timestamps noting that an additional 15 min have passed. In the Explanation conditions, the company publicly and directly responds to the criticism. Specifically, in these conditions, the company states that “analysts accounted for our lower bad debt estimate in their forecasts ... so our \$1.30 is comparable to their \$1.28,” and includes the critic’s username at the beginning of the tweet. I purposefully focus the explanation on the analyst consensus forecast to avoid sharing new information about the company. In the Redirection conditions, the company actively attempts to redirect investors’ attention to a favorable highlight. Specifically, in these conditions, the company repeats a positive message from its press release: “We delivered good first quarter results in the face of a challenging marketplace.”⁹

3.5. Investors’ judgments and decisions

Participants answer a series of questions directly after viewing all tweets. First, to inform my hypotheses, participants provide judgments of how the earnings event and related Twitter activity influenced how they value their position in the company’s stock, how other stock market participants value the company’s stock, and whether they would like to sell, hold, or buy additional shares of the company. While the first and second questions are meant to measure a participant’s perception of a change in firm value, the third measure is meant to capture the decision related to these perceptions.¹⁰ On the next screen, participants answer questions meant to measure perceptions of the company’s reputation.

Participants answer a number of additional process questions on the screens that follow these key measures. After answering manipulation check questions, participants also estimate the likelihood they would *retweet* or *like* the company’s final tweet if the hypothetical scenario was real. The following screen reveals all three of the company’s potential responses to the criticism—“No response from Deluxe,” the explanation tweet, and the redirection tweet—which participants rank from the most to least preferred response. Finally, participants share demographic data and answer three questions about the specifics of the case materials for the purpose of computing their bonus compensation.

4. Results and discussion

4.1. Manipulation checks

To assess the effectiveness of the retweet manipulation, I ask participants to identify the number of times the third party’s tweet was retweeted. Eighty-three percent of participants correctly answered *more than 100 times* or *one time*, depending on condition. Participants’ responses to this question are significantly associated with retweet condition ($\chi^2_{(1, N=481)} = 214.34$; $p < 0.01$, not tabulated) but are not associated with strategy condition ($\chi^2_{(2, N=481)} = 2.55$; $p = 0.28$, not tabulated), indicating a successful manipulation.

To assess the effectiveness of the response strategy manipulation,

⁹ Because managers are not likely to voluntarily provide bad explanations or to redirect attention to negative news events (Jung et al., 2017), I avoid these two scenarios in my experiment. Out-of-sample evidence suggests that individuals do perceive the company’s explanation to be relatively persuasive ($t_{(29)} = 2.63$; $p = 0.01$, not tabulated) and the content of the redirection to be relatively positive ($t_{(29)} = 4.81$; $p < 0.01$, not tabulated), as intended.

¹⁰ The second measure asks participants to reconsider the same scenario described in the first measure, but to do so in the third-person as opposed to in the first-person. This design choice was inspired by previous studies with dependent measures that ask participants to think about *another individual* who is considering an investment in the experimental firm (e.g., Koonce & Lipe, 2010; 2017)—the goal being to more precisely measure the opinion of interest without participants’ idiosyncratic personal preferences influencing their responses (e.g., risk preferences).

participants first view the company’s initial tweet and indicate whether they believe there were any other tweets from the company in the case materials (Yes or No). Participants who indicate Yes, and were randomly assigned to either the Explanation or the Redirection conditions, then view both additional tweets and select the one they viewed. Seventy-six percent of participants correctly answered this two-part manipulation check. Participants’ responses to the first question are significantly associated with whether they had, in fact, viewed another tweet from the company ($\chi^2_{(1, N=481)} = 128.57$; $p < 0.01$, not tabulated) and participants’ responses to the second question are significantly associated with whether they had, in fact, viewed the explanation or the redirection ($\chi^2_{(1, N=263)} = 228.22$; $p < 0.01$, not tabulated). Participants’ responses to neither question vary significantly with retweet condition (both $\chi^2 < 0.05$; both $p > 0.82$, not tabulated). These results suggest a successful manipulation of response strategy.

I use all available participants in the analyses that follow, although using only participants who pass both manipulation checks produces identical inferences.¹¹

4.2. Investment judgments

I design my experiment to test whether a firm can effectively manage investors’ perceptions by engaging with constituents on social media. To capture perceptions of the company as an investment, participants use three 11-point scales with labeled endpoints and mid-points to communicate how the earnings event and related Twitter activity affected (1) how they value their position in the company’s stock and (2) how other stock market participants value the company’s stock (*much less than, the same as, much more than before*), as well as (3) whether, and if so how, they would like to alter their ownership of the company (*sell all of my, hold onto my, buy a lot more shares*).¹² I choose to use multiple measures instead of a single measure to reduce noise and to increase the reliability and construct validity of my primary dependent variable (DeVellis, 2003; Diamantopoulos, Sarstedt, Fuchs, Wilczynski, & Kaiser, 2012; Evans, Feng, Hoffman, Moser, & Van der Stede, 2015). I code each measure from -5 to $+5$, with more negative (positive) values indicating a more negative (positive) impact on participants’ perceptions. As expected, these three measures are internally consistent ($\alpha = 0.82$) and load on a single factor (all factor loadings > 0.79 ; total variance explained = 74.11%), and so are averaged together to create one variable, *Investment*. Table 1 presents descriptive statistics for the three component measures as well as for *Investment* and Fig. 2 plots the means for *Investment* by experimental treatment.¹³

¹¹ There is one discrepancy in pass rates across conditions. Specifically, relative to participants in the Explanation or the Redirection conditions, participants in the No Response condition were statistically more likely to pass the retweet manipulation check (89% vs. 80% likely) and statistically less likely to pass the strategy manipulation check (70% vs. 79% likely). This discrepancy is not particularly surprising given (i) the retweet manipulation check is relatively easier for participants in the No Response condition because the manipulation and its related check are contiguous in this condition, but are separated by the firm’s response tweet in both the Explanation and the Redirection conditions, and (ii) the strategy manipulation check is relatively *harder* for participants in the No Response condition because the absence of an additional tweet is more difficult to recall than the presence of an additional tweet.

¹² I measure participants’ changes in perceptions in an effort to provide each participant with a relevant reference point. Although conceptually similar, measuring the difference between participants’ pre- and post-manipulation assessments of each key construct would be operationally more demanding and could add noise to my dependent variables. First, initial assessments would require the seeding of additional information about the experimental firm at the beginning of the case. This additional information as well as the additional questions themselves would add length and complexity to an already lengthy experimental instrument. Second, successfully measuring changes in this way requires each participant to either perfectly recall their initial assessment when making a later assessment—which is difficult to do without aid—or to be perfectly calibrated to a scale to which they were just introduced.

¹³ Except as noted in footnotes 17 and 18 below, all inferences are unchanged if any of the three component measures are used in place of *Investment*.

Table 1
Descriptive statistics: Investment judgments.

Panel A: Questions Used to Measure Changes in Investment Value

1. “As a result of this earnings event and related Twitter activity, I value my position in DLUX stock _____ I did before.” (*much less than, the same as, much more than*)
2. “As a result of this earnings event and related Twitter activity, I believe that other stock market participants value DLUX stock _____ before.” (*much less than, the same as, much more than*)
3. “Given what I know about Deluxe, I would like to _____ shares of DLUX.” (*sell all of my, hold onto my, buy a lot more*)

Panel B: Measures of changes in Investment Value, Mean [Standard Deviation], n = 558

Condition		n	Question			Average (Investment)
			1	2	3	
Control	(no criticism, no firm response)	77	1.71 [1.56]	1.60 [1.46]	0.99 [1.43]	1.43 [1.30]
Retweets	Strategy					
Few	No Response	80	0.53 [1.89]	0.48 [1.74]	0.15 [1.90]	0.38 [1.50]
	Explanation	77	0.44 [1.71]	-0.19 [1.94]	0.31 [2.03]	0.19 [1.66]
	Redirection	83	0.33 [1.64]	0.18 [1.83]	0.10 [1.72]	0.20 [1.48]
Many	No Response	81	-0.30 [1.79]	-1.11 [1.75]	-0.58 [1.99]	-0.66 [1.62]
	Explanation	78	0.47 [1.75]	-0.45 [1.88]	0.27 [1.81]	0.10 [1.41]
	Redirection	82	0.01 [1.62]	-0.33 [1.85]	-0.28 [1.74]	-0.20 [1.48]

Table 1 presents descriptive statistics for participants' responses to three questions designed to measure changes in investment value by condition. Participants responded to the three questions using 11-point scales (coded -5 to $+5$) with endpoint and midpoint labels corresponding to the parenthetical labels in Panel A for each question. These three measures are internally consistent ($\alpha = 0.82$) and load on a single factor (all factor loadings > 0.79 ; total variance explained = 74.11%), and so are averaged together to create one variable, *Investment*.

I manipulate the number of retweets a criticism receives (Few or Many) and a firm's strategy for handling negative attention on Twitter (No Response, Explanation, or Redirection). These two manipulations result in six treatment conditions. Participants randomly assigned to the Control condition made the same primary judgments as all other participants, but did so without ever viewing the third-party criticism or subsequent firm response (or non-response).

4.3. Results related to investment judgments

The omnibus *F*-test for *Investment* across all seven experimental conditions is significant ($F_{(6, 551)} = 14.42$; $p < 0.01$, not tabulated). Because participants in the Control condition view only the positive earnings news and never the criticism, I expect these participants to respond positively to the case overall. Consistent with this expectation, participants in the Control condition report significantly positive values of *Investment* ($t_{(76)} = 9.79$; $p < 0.01$, not tabulated).¹⁴ This result provides comfort that sample participants indeed attended to the details of the case. However, the six treatment conditions— 2×3 (*Retweets* \times *Strategy*)—are most relevant for testing my hypotheses. Thus, I use these six conditions in the analysis of variance (ANOVA) (Panel A) and related follow-up simple effects tests (Panel B) reported in Table 2.¹⁵

4.3.1. Retweets (H1)

As discussed in Section 2.4, I expect nonprofessional investors to

view retweets as a signal of consensus and, therefore, perceive the criticism to be more valid as the number of retweets a criticism receives increases. Lending support to my theory, Jonckheere-Terpstra tests using out-of-sample between-participants data collection reveal monotonically increasing relations between a criticism's retweet count (0, 36, 66, 126, or 1026) and perceptions of a tweet's consensus and perceptions of a tweet's validity (both $T_{JT} > 8033.50$, both $z > 3.98$; both $p < 0.01$, not tabulated). Relying on these relations, my first hypothesis then predicts that nonprofessional investors will view the firm less favorably when a criticism has been retweeted many (relative to few) times.

Consistent with H1, results reveal a significant and negative effect of *Retweets* when participants view no response from the firm (-0.66 vs. 0.38 ; $F_{(1, 475)} = 18.89$; $p < 0.01$). Moreover, even participants in the Few Retweets/No Response condition report significantly lower evaluations of the firm relative to the average investment judgment of participants in the Control condition (0.38 vs. 1.43 ; $t_{(157)} = -4.40$; $p < 0.01$, not tabulated).¹⁶ Together, results suggest (i) that simply

¹⁴ For ease of exposition, all reported *p*-values are two-tailed unless otherwise stated.

¹⁵ All inferences remain unchanged if I instead use the error term and degrees of freedom from the model that includes the Control condition.

¹⁶ For all comparisons that rely on the Control condition, I use Dunnett's method to control for the higher incidence of Type I error associated with making multiple comparisons.

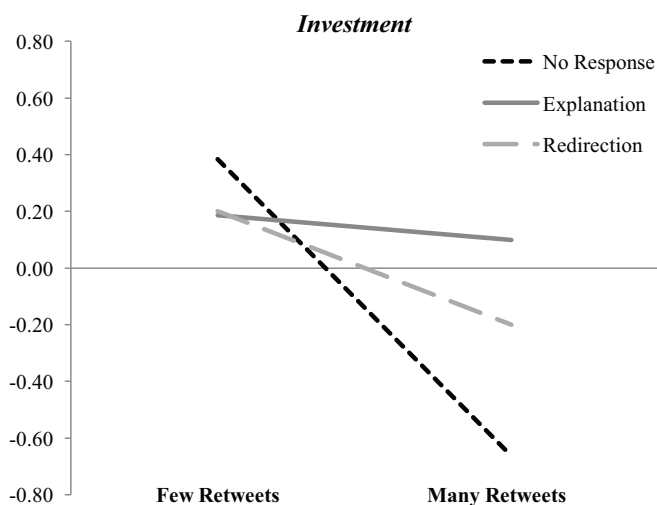


Fig. 2. Observed effects of criticism retweet count and firm response strategy on investment judgments.

Fig. 2 illustrates the means for my primary dependent variable, *Investment*, by experimental treatment, as reported in Table 1. In my experiment, I manipulate the number of retweets a criticism receives (Few or Many) and a firm's strategy for handling negative attention on Twitter (No Response, Explanation, or Redirection).

Table 2
Analysis of variance: Investment judgments.

Panel A: 2 × 3 Analysis of Variance (ANOVA) – dependent variable is <i>Investment</i>						
Source of Variation	Sum of Squares	d.f.	Mean Square	F-Statistic	p-Value	
Retweets	31.41	1	31.41	13.48	< 0.01	
Strategy	6.27	2	3.14	1.35	0.26	
Retweets × Strategy	18.96	2	9.48	4.07	0.02	
Error	1106.89	475	2.33			

Panel B: Simple effects tests – dependent variable is <i>Investment</i>						
Source of Variation	Fixed Condition	Sum of Squares	d.f.	Mean Square	F-Statistic	p-Value
Explanation vs. No Response	<i>Few Retweets</i>	1.53	1	1.53	0.66	0.42
	<i>Many Retweets</i>	23.00	1	23.00	9.87	< 0.01
Redirection vs. No Response	<i>Few Retweets</i>	1.36	1	1.36	0.58	0.45
	<i>Many Retweets</i>	8.75	1	8.75	3.75	0.05
Many vs. Few Retweets	<i>No Response</i>	44.03	1	44.03	18.89	< 0.01
	<i>Explanation</i>	0.30	1	0.30	0.13	0.72
	<i>Redirection</i>	6.60	1	6.60	2.83	0.09

Table 2 presents a 2 × 3 Analysis of Variance (Panel A) and the related simple effect tests relevant for testing my hypotheses (Panel B). In my experiment, I manipulate the number of retweets a criticism receives (Few or Many) and a firm's strategy for handling negative attention on Twitter (No Response, Explanation, or Redirection). *Investment* is the dependent variable in all analyses (defined in Table 1 as the average of three measures). All p-values are two-tailed.

viewing a criticism can make nonprofessional investors question the positive feelings that arise from a positive earnings announcement, and (ii) that collecting retweets is one way a criticism can further damage these perceptions.

4.3.2. Firm response strategies (H2 & H3)

Next, I predict that relative to not responding, providing an explanation will mitigate the criticism's negative effect on investors' judgments (H2) but attempting to redirect attention will exacerbate the

criticism's negative effect on investors' judgments (H3). I further predict that both effects will be larger (smaller) when the criticism has been retweeted many (few) times. The 2 × 3 (*Retweets* × *Strategy*) interaction reported in Table 2, Panel A is significant ($F_{(2, 475)} = 4.07$; $p = 0.02$), suggesting that the criticism's retweet count and the firm's response strategy indeed interact to affect participants' judgments. Table 2, Panel B reports the simple effects tests relevant for examining the nature of this interaction and for testing my hypotheses.

Consistent with H2, comparing the explanation and no response strategies within each retweet condition reveals that the effect of the explanation is positive and significant when provided in response to a criticism that has been retweeted many times (0.10 vs. -0.66; $F_{(1, 475)} = 9.87$; $p < 0.01$), but is not significant when provided in response to a criticism that has been retweeted only a few times (0.19 vs. 0.38; $F_{(1, 475)} = 0.66$; $p = 0.42$). Further, the simple difference between the explanation and no response strategies is larger when there are many, relative to few, retweets ($t_{(475)} = 2.78$; $p < 0.01$, not tabulated). This combination of results is consistent with nonprofessional investors valuing the firm's provision of an explanation, but only when they perceive the initial criticism to be valid.¹⁷

Contrary to H3, the observed pattern of results suggests that redirecting attention also appears to mitigate the negative effect of the criticism on *Investment*. Specifically, comparing the redirection and no response strategies within each retweet condition reveals that the effect of the redirection is positive and significant when provided in response to a criticism that has been retweeted many times (-0.20 vs. -0.66; $F_{(1, 475)} = 3.75$; $p = 0.05$), but not significant when provided in response to a criticism that has been retweeted few times (0.20 vs. 0.38; $F_{(1, 475)} = 0.58$; $p = 0.45$). Further, the simple difference between the redirection and no response strategies is larger when there are many, relative to few, retweets ($t_{(475)} = 1.91$; $p = 0.06$, not tabulated). Together, it appears that engaging in a strategy of redirection can prove beneficial to a firm trying to protect its image after receiving perceived-to-be valid negative attention on Twitter (relative to taking no action). I examine this unexpected result further in Section 4.5.¹⁸

Interestingly, despite the positive effects of both the explanation and the redirection strategies, participants in these conditions still report significantly lower evaluations of the firm relative to participants in the Control condition (all $t_{(=157)} < -5.18$; all $p < 0.01$, not tabulated). The fact that neither the explanation nor the redirection fully eliminates the criticism's damage suggests that even successfully managing investors' perceptions *ex post* may not restore investors to the positive state they would have had if the criticism had never been viewed in the first place. This inference is consistent with research in psychology that suggests once information is internalized it is difficult to dismiss, regardless of its legitimacy (Gilbert, Krull, & Malone, 1990).

4.4. Supplemental analyses

4.4.1. Social media and corporate reputation

Recall that public relations agencies have expressed concerns about

¹⁷ If I replace the composite *Investment* measure with each of its components individually, all statistical inferences directly informing H2 are identical. In addition, all simple effects tests return inferentially identical results for the three component measures except for one case. Specifically, when the criticism has been retweeted only a few times, the explanation actually results in less favorable (rather than comparable) perceptions of the firm relative to no response for the second component measure ($p = 0.02$, not tabulated). Although this result for only one measure in one simple effects test might not be generalizable, it is potentially interesting, as it suggests that when the initial criticism is not perceived to be valid, it could be worse for the firm to explain than to not respond at all.

¹⁸ If I replace the composite *Investment* measure with each of its components individually, the simple difference between *No Response* and *Redirection* given *Many Retweets* and the difference in difference test are directionally consistent for all three component measures, but are statistically significant for only the second component measure (both $p < 0.01$, not tabulated). This pattern of results is further evidence that the composite measure is a more powerful measure than any single component measure.

the risk that social media pose to corporate reputations (e.g., [Accenture, 2014](#)) and [Lee et al. \(2015\)](#) theorize that a firm can also utilize social media to help *repair* its reputation in the wake of a crisis such as a large-scale product recall. [Lee et al. \(2015\)](#) test their theory using stock price changes to proxy for the reputational consequences of a firm's response to a crisis. In this section, I rely on the experimental method's ability to more directly measure investors' feelings about the firm to both triangulate and extend the findings of [Lee et al. \(2015\)](#).

To capture perceptions of corporate reputation, participants use four 11-point scales with labeled endpoints and midpoints to communicate how the Twitter activity they viewed impacted (1) their beliefs about the company's overall reputation, (2) their feelings about the company, (3) how much they trust the company, and (4) how much they admire and respect the company.¹⁹ Analogous to *Investment*, I code each measure from -5 to $+5$, with more negative (positive) values indicating a more negative (positive) impact on participants' perceptions. These four measures are internally consistent ($\alpha = 0.94$) and load on a single factor (all factor loadings > 0.88 ; total variance explained = 84.83%), and so are averaged together to create one variable, *Reputation*. In short, I find that replacing *Investment* with *Reputation* for each test reported in Section 4.3 produces identical inferences (not tabulated). These results are consistent with Lee et al.'s conclusion that firm tweets can attenuate the reputational damage caused by a negative event. However, that this attenuation could result from *either* a firm-provided explanation *or* a firm's attempt to redirect attention is a new insight; one that contributes to the broader understanding of firms' social media use.²⁰

4.4.2. Nonprofessional investor engagement with firm tweets

I also examine whether a participant's propensity to *retweet* or to *like* the company's tweets varies by condition. Whereas participants in either the Explanation or the Redirection condition make their judgments about the company's respective response tweet, participants in the No Response condition do so for the original earnings release tweet. This investigation reveals that the company's redirection is less likely to be retweeted and less likely to be liked than either its original earnings release tweet or its explanation (all $F_{(1, 475)} > 2.84$; all $p < 0.09$, not tabulated). These findings are informative for managers, as they highlight two additional tradeoffs to consider when deciding how to respond to negative attention online—expected dissemination of and visible support for a company's response.

4.4.3. Evidence that the effects are a result of nonprofessional investors' conscious processing

At the conclusion of the experimental case, the survey presents all three possible responses side-by-side (in random order) and asks participants to rank them from most to least preferred. Whereas the majority of participants (57 percent) rank the explanation as the most preferred response, only 26 and 17 percent rank the redirection and the non-response as most preferred, respectively ($\chi^2_{(2, N=478)} = 124.52$; $p < 0.01$, not tabulated).²¹ Participants also exhibit strong support for

¹⁹ I adapt these four company-level measures from [Ponzi, Fombrun, and Gardberg \(2011\)](#), who develop and validate a simplified measure of corporate reputation.

²⁰ In my experimental instrument, I present the reputation measures after the investment-related measures to avoid biasing my primary dependent variables. Like many studies that test for mediation using a similar design choice, I conduct analyses using both the [Baron and Kenny \(1986\)](#) approach and a Structural Equation Modeling approach and find evidence consistent with *Reputation* fully mediating the relations I document between my experimental manipulations and *Investment* (not tabulated). However, as discussed by [Griffith, Kadous, and Young \(2016\)](#) and by [Libby, Rennekamp, and Seybert \(2015\)](#), although I designed the two sets of questions to measure theoretically linked, but distinct constructs, it remains possible that first answering the investment-related questions influences participants' responses to the reputation questions. Furthermore, all component measures of *Reputation* and of *Investment* appear to be significantly correlated (all $r > 0.49$; all $p < 0.01$), which could suggest that participants did *not* view the two sets of questions as representing two distinct constructs, as intended. Thus, the mediation analyses should be interpreted with these caveats in mind.

the redirection as the second-most preferred response. That is, 48 percent rank the redirection as second-best, whereas 28 and 24 percent award the explanation and the non-response this place ($\chi^2_{(2, N=471)} = 46.41$; $p < 0.01$, not tabulated). Together, this rank ordering is consistent with that observed in the between-participants results. Thus, the findings appear to be largely driven by investors' conscious processing of the initial criticism and the firm's response (or non-response) ([Kahneman & Tversky, 1996](#); [Libby et al., 2002](#)), which is consistent with the theory that investors take a positive signal from both the explanation and the redirection.

4.5. Reexamining the redirection strategy's benefits with additional experimentation

In my primary experiment, I did *not* observe an exacerbation of the negative effect of the criticism on investors' evaluations of the firm when the firm engaged in the redirection strategy, as I had predicted in H3. Despite my *ex ante* expectation that the redirection strategy would backfire, redirecting attention actually appears useful for repairing damaged perceptions of a firm. I conduct additional experimentation to explore this unexpected result, as explained below.

4.5.1. Are the redirection strategy's benefits limited to current investors?

In light of research examining the effects of individuals' investment positions on their judgments and decisions (e.g., [Fanning, Agoglia, & Piercey, 2015](#); [Hales, 2007](#); [Thayer, 2011](#)), participants' role as a current investor provides one potential explanation for the observed benefits of the redirection strategy. Specifically, because participants in my primary experiment assumed they were currently invested in the company, they were motivated to view the company favorably. This motivation, in turn, could have inspired a biased, favorable assessment of the company's response ([Kunda, 1990](#)).

To address motivated reasoning as a potential explanation, I replicate the Many Retweets/No Response and the Many Retweets/Redirection conditions from the primary experiment with one modification; this time, participants assume the role of a *prospective* (as opposed to a current) investor. If the redirection fails to positively impact the perceptions of investors who lack motivation to view the company favorably, then that would indicate that current investors' biased reasoning is driving the redirection strategy result in the primary experiment. In contrast, if the benefits of the redirection strategy continue to exist even for prospective investor-participants, then that would suggest that motivated reasoning cannot fully explain the result.

As reported in Panel A of [Table 3](#), relative to the prospective investor-participants in the No Response condition, participants in the Redirection-Firm condition again view an investment in the company more favorably (-0.08 vs. -0.59 ; $t_{(58)} = 1.38$; $p = 0.09$, one-tailed) and the company as more reputable (-0.48 vs. -1.23 ; $t_{(58)} = 1.93$; $p = 0.03$, one-tailed).²² These judgments are consistent with the judgments of the current investor-participants in the main analyses. Taken together, results suggest the generality of the redirection strategy's benefits to both current and prospective investors, indicating that motivated reasoning cannot fully explain the result.

4.5.2. Are the redirection strategy's benefits driven by the content or the source of redirection?

The within-participants results reported in Section 4.4.3 and the follow-on experiment reported in Section 4.5.1 are consistent with nonprofessional investors consciously processing the firm's redirection tweet. Together with the findings of the primary experiment, these

²¹ There were ten instances in which a participant reported not being able to choose between two strategies for a particular rank. These ten ties were left out of the relevant analyses.

²² p -values in this subsection are one-tailed, consistent with the directional result from the main analyses I investigate herein.

Table 3
Additional experimentation: Reexamining the redirection strategy.

Panel A: Prospective investor-participants – descriptive statistics (mean, [standard deviation]) and two-sample <i>t</i> -tests						
Strategy						
Dependent Variable	No Response (n = 30)	Redirection-Firm (n = 30)	Mean Difference	d.f.	<i>t</i> -Statistic	<i>p</i> -Value
<i>Investment</i>	-0.59 [1.63]	-0.08 [1.22]	0.51	58	1.38	0.09 ⁺
<i>Reputation</i>	-1.23 [1.72]	-0.48 [1.25]	0.75	58	1.93	0.03 ⁺
Panel B: Relatively more credible source of redirection (news source) – descriptive statistics (mean, [standard deviation]) and two-sample <i>t</i> -tests						
Strategy						
Dependent Variable	No Response (n = 30)	Redirection-News (n = 29)	Mean Difference	d.f.	<i>t</i> -Statistic	<i>p</i> -Value
<i>Investment</i>	-0.59 [1.63]	-0.02 [1.51]	0.57	57	1.38	0.09 ⁺
<i>Reputation</i>	-1.23 [1.72]	-0.28 [1.74]	0.94	57	2.09	0.02 ⁺
Panel C: Relatively less credible source of redirection (unfamiliar individual) – descriptive statistics (mean, [standard deviation]) and two-sample <i>t</i> -tests						
Strategy						
Dependent Variable	No Response (n = 30)	Redirection-Individual (n = 30)	Mean Difference	d.f.	<i>t</i> -Statistic	<i>p</i> -Value
<i>Investment</i>	-0.63 [1.68]	-0.81 [1.22]	-0.18	58	-0.47	0.68 ⁺
<i>Reputation</i>	-1.13 [1.61]	-1.35 [1.29]	-0.22	58	-0.57	0.72 ⁺

Table 3 presents descriptive statistics and the relevant two-sample *t*-tests for *Investment* and *Reputation* for three 1 × 2 experiments related to the redirection strategy. Participants of both conditions in all three experiments viewed a criticism with many retweets.

Panel A presents the results of a replication of the Many Retweets/No Response and the Many Retweets/Redirection conditions of the primary experiment with one modification: instead of assuming the role of a current investor, participants assume they are *considering* investing in the experimental firm. Panel B (Panel C) presents the results of the same two conditions with one additional modification: instead of the firm itself engaging in the redirection strategy, a news organization (an unfamiliar individual) authors the redirection tweet. The experiments reported in Panels A and B were facilitated at the same time, and so they share a common No Response condition.

⁺All *p*-values are one-tailed, consistent with the directional result from the main analyses I set out to replicate.

results suggest that study participants evidently do *not* interpret the firm's redirection to mean that the firm has no good explanation; instead, participants appear to take a *positive* cue from the firm's redirection. Because it is not clear at this point whether participants take this cue from the content of the redirection, the source of the redirection, or both, I collect additional data in an effort to shed light on these two potential determinants.

Panels B and C of Table 3 report the results of two 1 × 2 (Many Retweets/No Response vs. Many Retweets/Redirection) experiments that differ only in the source of the redirection: a news source or an unfamiliar individual, respectively. By varying the source of the redirection, I vary the relative credibility of the tweeters involved in the discussion of the firm (the critic and the author of the subsequent

tweet).^{23,24} If investors require that the source of the redirection be credible to take a positive cue from the redirection, I expect the redirection strategy to provide benefits *only* if employed by the relatively more credible source. That is, the same tweet delivered by a relatively less credible source should not unwind the damage originally done by the criticism. In contrast, if the observed benefits of the redirection strategy are driven solely by the positive valence of the redirection, the source of the redirection should not impact the strategy's efficacy.

In sum, results are consistent with nonprofessional investors taking a positive cue from the source (not solely the content) of the redirection. Specifically, participants in the Redirection-News condition (Panel B) again view an investment in the company more favorably (−0.02 vs. −0.59; $t_{(57)} = 1.38$; $p = 0.09$, one-tailed) and the company as more reputable (−0.28 vs. −1.23; $t_{(57)} = 2.09$; $p = 0.02$, one-tailed), on average, than participants in the corresponding No Response condition. In contrast, participants in the Redirection-Individual condition (Panel C) provide judgments about the company that are not statistically different from the judgments of participants in the corresponding No Response condition (*Investment*: −0.81 vs. −0.63; $t_{(58)} = -0.47$; $p = 0.68$, one-tailed; *Reputation*: −1.35 vs. −1.13; $t_{(58)} = -0.57$; $p = 0.72$, one-tailed). Together, results suggest that the apparent dismissal of a firm-directed criticism by a relatively more credible source can send a signal to investors that the criticism may not be serious enough to warrant an explanation; but that the same dismissal, if delivered by a relatively *less* credible source, is unlikely to have the same positive effect.²⁵ This implication is intuitive because both no response at all and an unrelated response from a relatively less credible source can leave investors uncertain about whether an explanation is yet to come.

5. Conclusion

In this study, I examine how a firm's engagement after receiving negative attention on Twitter affects investors' perceptions of a firm. First, I demonstrate that the damage a critical tweet causes to investors' perceptions increases in the number of times the criticism is retweeted. This inference is non-trivial, as market participants with directional incentives could have some success manipulating a firm's stock price by making posts on social media and encouraging retweets. These results introduce to the literature an additional and increasingly relevant determinant of perceived validity—retweet count—and should generalize to other determinants of perceived validity within social media as well; such as the credibility of the critic, how many *likes* the post receives, and other statements made in response to the critical post.

Next, I investigate three strategies a firm might consider in response to receiving negative attention on social media: (1) abstaining from the conversation, (2) addressing the criticism by publicly responding to the individual's concerns, and (3) redirecting investors' attention to positive

²³ While the source credibility of a criticism is likely to directly inform the perceived validity of that criticism (and therefore, investors' reactions to that criticism), it is unclear whether the source credibility of a redirection will matter for investors' reactions to that redirection. For instance, if the redirection affects inferences by simply providing a distraction, then its source credibility is unlikely to matter.

²⁴ To ensure that participants would perceive the two sources of redirection as intended, I asked 19 (20) additional individuals from the same population about the relative credibility of the critic, who has been retweeted many times, and the news source (unfamiliar individual). This out-of-sample evidence suggests that participants indeed perceive the news source as relatively *more* credible than the critic ($t_{(18)} = 2.32$; $p = 0.03$, two-tailed, not tabulated) and the individual redirector as relatively *less* credible than the critic ($t_{(19)} = -2.96$; $p < 0.01$, two-tailed, not tabulated).

²⁵ This inference is subject to the caveat that I facilitated these two experiments on different days. Although two facts provide comfort: (i) that participants of the No Response condition responded similarly on both key measures across the two experiments (both $F_{(1, 58)} < 0.05$; both $p > 0.83$, two-tailed) and (ii) that participants also did not vary significantly on any available demographic characteristic across the two experiments—I cannot be certain whether participants of the two experiments differed systematically on other, unobservable characteristics.

information. Taken together, results suggest that *either* providing an explanation *or* attempting to redirect attention after a criticism gains traction helps to mitigate, but does not fully eliminate, the criticism's negative effect on nonprofessional investors' evaluations of the firm. In subsequent experimentation, I find that the benefits of the redirection strategy are present for both current and prospective investors, suggesting the generality of the finding across investment positions. In contrast, *who does the redirecting* does appear to matter for investors' perceptions. Specifically, I find that the redirection successfully repairs investors' perceptions only when employed by a source that is relatively more credible than the critic.

As with all studies, my study has limitations that lay the groundwork for future research. First, I examine two different firm tweets and the absence of a tweet to capture the spirit of three broader strategies. Given a specific strategy, however, how a firm constructs its responses—what pronouns, words, acronyms, or visuals it uses—is likely to have implications for investors' perceptions (Asay, Libby, & Rennekamp, 2018; Hales, Kuang, & Venkataraman, 2011; Rennekamp & Witz, 2017; Tan, Wang, & Zhou, 2014). Similarly, although firms are not likely to voluntarily provide bad explanations or to redirect attention to negative information (Jung et al., 2017), the quality of the explanation and the valence of the redirection are likely to matter for investors' perceptions (Barton & Mercer, 2005). Indeed, any inference drawn from comparing the explanation and the redirection strategies in my experiment is subject to the caveat that the strength of each response can vary in practice. For example, perhaps a redirection that introduces *new* positive information could prove to be more effective at minimizing investors' negative reactions than a very weak explanation. Exploring the boundary conditions of a given strategy and also exploring the costs and benefits of other possible strategies not tested in my study provide interesting avenues for future research. For example, could attempting to preempt likely criticisms be a superior strategy? (See Cikurel, Fanning, and Jackson (2017) for preliminary evidence.)

Second, I compare two realistic levels of retweets (1 and 126) for the purpose of maximizing the external validity of my inferences. Additional research is needed to determine whether these inferences generalize to different levels of retweets and to the interaction of retweets with other potential determinants of perceived validity. Relatedly, although the inference that how a firm responds to a criticism will matter more when investors perceive the criticism to be of higher validity should generalize across investor types, certain investors may be more or less sensitive than others to retweets as a signal of this

validity. For example, more sophisticated investors might rely solely on their expertise or accounting knowledge to more directly assess the validity of a criticism. Moreover, if an investor's persuasion, topic, or agent knowledge changes with sophistication, reactions to a specific firm response strategy may also differ with investor sophistication. Thus, future research exploring how more sophisticated investors react to criticisms levied on Twitter and to firm tweets could provide a more complete understanding of when firms are likely to benefit by participating in, rather than abstaining from, conversations about the firm on social media.

Third, when firm management chooses to engage with stakeholders on social media, it exposes itself to the possibility of sparking additional engagement or conversation. That is, capital market participants who are active on social media could interact with the firm tweet by *liking* or *retweeting* it or could have something to say in response to the firm's tweets. Although I provide initial evidence that investors are more likely to *like* and more likely to *retweet* the explanation than the redirection, it is possible that an explanation would also result in more, and potentially more negative, responses from other users than a redirection would. Thus, further study on the *net* benefits of each strategy is needed.

Finally, potential participants had access to the necessary criteria for participation via the study's advertisement when they were responding to the questions designed to screen out unqualified individuals. Thus, potential participants had the opportunity and, arguably, the incentive to misrepresent themselves, which could reduce the effectiveness of my screening procedure. Although there is no evidence to suggest that a meaningful proportion of participants *were* dishonest, I cannot know for sure whether this is the case. As such, a maintained assumption for my sample to be one of nonprofessional investors familiar with financial statements is that potential participants answered these screening questions honestly. Since collecting data for this study, a method for screening MTurk workers that reduces the opportunity and incentive to be dishonest has been brought to my attention. For example, I could have first granted a "has invested" and a "has read a financial statement" qualification to MTurk workers based on their responses to a simple demographic survey that includes questions about multiple, unrelated topics, and then allowed only workers with those two qualifications to access the study. Future researchers could consider this alternate approach when considering best practices for recruiting participants on [MTurk.com](https://www.mturk.com).

Appendix A. Example of negative attention on Twitter (@ReformedBroker, 1.01M followers)²⁶

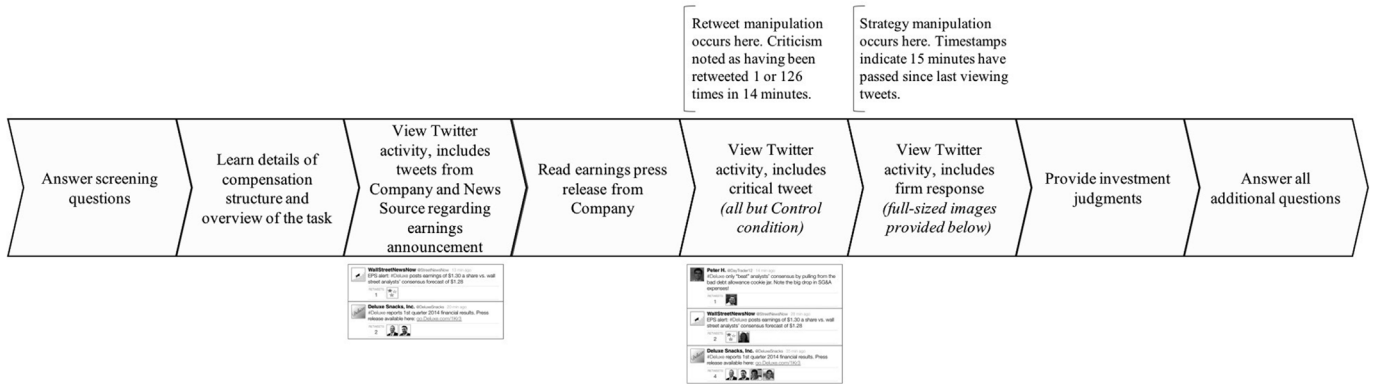
The screenshot displays a Twitter thread. At the top is the tweet from **Downtown Josh Brown** (@ReformedBroker), posted at 5:42 AM on April 14, 2014. The tweet text reads: "Citi's core business was terrible this quarter (net income down 8%), but it 'beat' by pulling from the loss reserves cookie jar. Again. \$C". The tweet has 21 retweets and 13 favorites. Below the tweet are seven replies, each from a different user, all dated April 14. The replies are:

- Ivan the K™** (@IvanTheK): "Regulators don't eat cookies, so Citi still has work to do." (1 retweet, 1 favorite)
- JJ** (@JJSinghSTARR): "surely if you fall a stress test you should be increasing reserves. I think Corbat misunderstood..." (1 retweet, 1 favorite)
- Veris** (@verisbenchmarks): "Ha ha, there's always some slight of hand accounting involved." (1 retweet, 1 favorite)
- Michael Shea** (@cirrusdriver): "But the analyst who was on tv 10 seconds after the release didn't say this." (1 retweet, 1 favorite)
- Njonjo Ndehi** (@bensonnndehi): "Cooking the books using the Goal Seek feature of Excel." (1 retweet, 1 favorite)
- Chris Arnade** (@Chris_arnade): "in a true economic meritocracy Citi would not exist. I say this as someone who worked there for 20 years.." (1 retweet, 1 favorite)
- Rob Haldeman** (@Rob_Haldeman): "talking heads lovin \$C right now. Guess I have to read this for myself now #duediligence" (1 retweet, 1 favorite)
- Craig Scott** (@CraigScott31): "I do think \$bac report Wed will start to differentiate from the pack as ML unit should be a gem." (1 retweet, 1 favorite)

 Each reply includes a profile picture, name, handle, timestamp, text, and interaction icons (reply, retweet, favorite, more).

²⁶ Follower counts in this appendix and throughout the paper are as of February 8, 2018.

Appendix B. Experimental Materials – each image represents the final screen of the experimental case for a different experimental condition. Images have been altered to protect the identities of the individuals photographed



Control condition

Recent tweets with hashtag #Deluxe:



Few retweets/no response strategy condition

Recent tweets with hashtag #Deluxe:



Many retweets/no response strategy condition

Recent tweets with hashtag #Deluxe:

	<p>Peter H. @DayTrader12 · 29 min ago #Deluxe only “beat” analysts’ consensus by pulling from the bad debt allowance cookie jar. Note the big drop in SG&A expenses!</p> <p>RETWEETS 141</p> 
	<p>WallStreetNewsNow @StreetNewsNow · 43 min ago EPS alert: #Deluxe posts earnings of \$1.30 a share vs. wall street analysts’ consensus forecast of \$1.28</p> <p>RETWEETS 4</p> 
	<p>Deluxe Snacks, Inc. @DeluxeSnacks · 50 min ago #Deluxe reports 1st quarter 2014 financial results. Press release available here: go.Deluxe.com/1Kr3</p> <p>RETWEETS 6</p> 


Few retweets/explanation strategy condition

Recent tweets with hashtag #Deluxe:

	<p>Deluxe Snacks, Inc. @DeluxeSnacks · 1 min ago @DayTrader12: Analysts accounted for our lower bad debt estimate in their forecasts... So our \$1.30 is comparable to their \$1.28 #Deluxe</p> <p>RETWEETS 0</p>
	<p>Peter H. @DayTrader12 · 29 min ago #Deluxe only “beat” analysts’ consensus by pulling from the bad debt allowance cookie jar. Note the big drop in SG&A expenses!</p> <p>RETWEETS 1</p> 
	<p>WallStreetNewsNow @StreetNewsNow · 43 min ago EPS alert: #Deluxe posts earnings of \$1.30 a share vs. wall street analysts’ consensus forecast of \$1.28</p> <p>RETWEETS 4</p> 
	<p>Deluxe Snacks, Inc. @DeluxeSnacks · 50 min ago #Deluxe reports 1st quarter 2014 financial results. Press release available here: go.Deluxe.com/1Kr3</p> <p>RETWEETS 6</p> 

Many retweets/explanation strategy condition

Recent tweets with hashtag #Deluxe:

	Deluxe Snacks, Inc. @DeluxeSnacks · 1 min ago @DayTrader12: Analysts accounted for our lower bad debt estimate in their forecasts... So our \$1.30 is comparable to their \$1.28 #Deluxe
RETWEETS	0
	Peter H. @DayTrader12 · 29 min ago #Deluxe only "beat" analysts' consensus by pulling from the bad debt allowance cookie jar. Note the big drop in SG&A expenses!
RETWEETS	141 
	WallStreetNewsNow @StreetNewsNow · 43 min ago EPS alert: #Deluxe posts earnings of \$1.30 a share vs. wall street analysts' consensus forecast of \$1.28
RETWEETS	4 
	Deluxe Snacks, Inc. @DeluxeSnacks · 50 min ago #Deluxe reports 1st quarter 2014 financial results. Press release available here: go.Deluxe.com/1Kr3
RETWEETS	6 

Few retweets/redirection strategy condition

Recent tweets with hashtag #Deluxe:

	Deluxe Snacks, Inc. @DeluxeSnacks · 1 min ago Deluxe CEO on conference call: "We delivered good first quarter results in the face of a challenging marketplace." #Deluxe
RETWEETS	0
	Peter H. @DayTrader12 · 29 min ago #Deluxe only "beat" analysts' consensus by pulling from the bad debt allowance cookie jar. Note the big drop in SG&A expenses!
RETWEETS	1 
	WallStreetNewsNow @StreetNewsNow · 43 min ago EPS alert: #Deluxe posts earnings of \$1.30 a share vs. wall street analysts' consensus forecast of \$1.28
RETWEETS	4 
	Deluxe Snacks, Inc. @DeluxeSnacks · 50 min ago #Deluxe reports 1st quarter 2014 financial results. Press release available here: go.Deluxe.com/1Kr3
RETWEETS	6 

Many retweets/redirection strategy condition

Recent tweets with hashtag #Deluxe:

Deluxe Snacks, Inc. @DeluxeSnacks · 1 min ago
Deluxe CEO on conference call: "We delivered good first quarter results in the face of a challenging marketplace."
#Deluxe
RETWEETS: 0

Peter H. @DayTrader12 · 29 min ago
#Deluxe only "beat" analysts' consensus by pulling from the bad debt allowance cookie jar. Note the big drop in SG&A expenses!
RETWEETS: 141

WallStreetNewsNow @StreetNewsNow · 43 min ago
EPS alert: #Deluxe posts earnings of \$1.30 a share vs. wall street analysts' consensus forecast of \$1.28
RETWEETS: 4

Deluxe Snacks, Inc. @DeluxeSnacks · 50 min ago
#Deluxe reports 1st quarter 2014 financial results. Press release available here: go.Deluxe.com/1Kr3
RETWEETS: 6

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