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ABSTRACT

Firms consider multiple reference points simultaneously to assess performance, yet often these referents may be inconsistent in signaling success or failure. Consequently, decision makers use two contrasting decision rules when responding to inconsistent feedback: problem-solving or self-enhancement. So far, disparate theoretical logics and mixed evidence has limited our understanding about when decision makers may shift their attention from positive to negative aspects of inconsistent feedback or vice versa, and may increase or decrease their R&D search. We examine how different types of CEO power explain why some firms may respond to inconsistent feedback, i.e. positive performance feedback and negative prospects, in distinct ways. We find that firms engaged in less R&D search as a response to inconsistent feedback when CEOs had high levels of structural, ownership or expert power. In contrast, when CEOs had high levels of prestige power, firms undertook more R&D search as a response to inconsistent feedback. Our findings provide new insights and contribute to conversations about CEO power and performance feedback within the context of the behavioral theory of the firm.

Research on the role of performance feedback in understanding organizational behavior has been burgeoning (Gavetti, Greve, Levinthal, & Ocasio, 2012), and scholars have devoted substantial attention to addressing the impact of performance feedback on strategic decisions such as investment in research and development (R&D) (Cyert & March, 1963; Greve, 2003). Although earlier studies have largely focused on the effects of single performance referents, scholars have suggested that decision makers use multiple and diverse reference points simultaneously when gauging organizational performance (Baum, Rowley, Shipilov, & Chuang, 2005; Chen, 2008; Washburn & Bromiley, 2012). If these differ in terms of signaling success or failure, decision makers are confronted with inconsistent feedback that causes important distortions in performance assessment and decision-making processes (Baum et al., 2005; Chen, 2008; Hu, He, Blettner, & Bettis, 2017; Joseph & Gaba, 2015; Lucas, Knopen, Meeus, 2018). For instance, interpretive efforts of inconsistent feedback may amplify differences in opinion and may cause intense debates among senior executives and other stakeholders which complicates decision making (Greve & Gaba, 2017). Because of these complex and challenging circumstances, scholars have proposed two contrasting decision rules that decision makers may use when assessing and responding to inconsistent feedback (Audia & Brion, 2007; Greve, 1998).

The first decision rule – referred to as problem-solving (Cyert & March, 1963; Greve, 2003) – suggests that decision makers prioritize those indicators that fall below aspirations. Assuming that individuals are motivated to solve problems, they try to reduce negative discrepancies between actual and desired outcomes by engaging in problemistic R&D search. The second decision rule – referred to as self-enhancement (Audia & Brion, 2007; Sedikides & Strube, 1997) – predicts that decision makers give greater attention to performance referents that are above the aspiration level. Because of the desire to protect their self-image, they tend to

portray inconsistent feedback more positively and judge R&D search to be unnecessary (Audia & Brion, 2007; Dunning, Meyerowitz, & Holzberg, 1989). Empirical evidence about which decision rule prevails when dealing with inconsistent feedback has been rather inconclusive and mixed. Whereas Greve (1998) did not find any significant effect between inconsistent feedback and new product introductions, others have found support for either the problem-solving (Baum et al., 2005; Hu et al., 2017; Joseph & Gaba, 2015) or self-enhancing perspective (Lucas et al., 2018). These disparate findings clearly signal the need for a deeper understanding about the conditions under which decision makers may act as problem-solvers or self-enhancers when responding to inconsistent feedback. Hence, we respond to recent calls for providing more exhaustive explanations (Greve & Gaba, 2017; Lucas et al., 2018) and advance research about how inconsistent feedback affects organizational adaptation in at least three important ways.

First, we bring together disparate theoretical logics and identify *when* decision makers problem-solve or self-enhance while interpreting and responding to inconsistent feedback. Given the profound impact of chief executive officers (CEOs) on decision-making processes and strategic actions (Quigley & Hambrick, 2015), we examine how CEO power serves as a foundational source of bias and shapes decision rules when considering inconsistent feedback. Referred to as the capacity of individuals to influence other coalition members (Finkelstein, 1992: 506), powerful CEOs may not only employ explicit influence tactics such as information withholding or agenda control but also exercise their power more implicitly by shaping the norms governing decisions and other executives' interpretive schemes (Pfeffer, 1981). Our contingency model augments research on performance feedback and self-enhancement theory (Jordan & Audia, 2012) and sheds light on controversies from both theories' predictions about how decision makers may respond to inconsistent feedback.

Second, although research has acknowledged that CEOs play a critical role in shaping strategic decision making (Quickley & Hambrick, 2015), it has typically assumed self-enhancing biases to be prevalent among powerful CEOs (Jordan & Audia, 2012; Pfeffer & Fong, 2005). We move beyond such a restricted focus on power and self-serving attributions and forward a more balanced view about the impact of CEO power on the assessment process of and subsequent response to inconsistent feedback. Since CEO power may come from various sources associated with different types of power including structural, ownership, expert and prestige power (Finkelstein, 1992), we suggest that what distinguishes powerful CEOs from using either the problem-solving or self-enhancement decision rule is their underlying basis of power. Even when confronted with similar inconsistent feedback, we recognize that each type of CEO power shapes attention shifts to either positive or negative parts of inconsistent feedback, and hence, explains whether firms ultimately increase their R&D search or not (Greve & Gaba, 2017).

Third, recent studies examining the consequences of inconsistent feedback have almost exclusively focused on internal contradictions among backward-looking performance assessments such as the ones based on historical and social aspirations (Hu et al., 2015; Joseph & Gaba, 2015; Lucas et al., 2018). Yet, forward-looking prospects indicate whether probable outcomes of planned behavior would result in the successful achievement of set targets (Chen, 2008; Gavetti & Levinthal, 2000; Greve, 2003). Because the allocation of resources to R&D requires complex judgement about future prospects (Arrfelt, Wiseman, & Hult, 2013), we argue that CEOs are particularly confronted with inconsistencies when they have positive feedback about past performance, yet receive poor future prospects. By using this configuration of inconsistent feedback, we are able to explore how distinct sources of CEO power affect the tendencies that firms may resist problemistic search and persist with outdated strategies that have

proven to be successful in the past (Clapham & Schwenk, 1991). For completeness, we also show the results for the alternative configuration of inconsistent performance referents where performance feedback is negative but future prospects are positive.

THEORY AND HYPOTHESES

Building on the seminal work of Cyert & March (1963), scholars have widely considered the role of performance feedback in organizational behavior. Portraying performance feedback as a performance evaluation process during which current performance is evaluated against an aspiration level, the behavioral theory of the firm (BTOF) generally suggests that firms initiate problemistic search when they perform below aspiration levels (Posen, Keil, Kim, Meissner, 2018). Scholars have discerned various types of problemistic search behaviors, including new product introductions (Greve, 1998), acquisitions (Iyer, & Miller, 2008) and strategic investments (Souder & Bromiley, 2012), yet most studies have considered R&D search, or the allocation of resources to R&D, as a key behavioral consequence of performance feedback (Shinkle, 2012). Research has also established that performance is often evaluated using historical and social aspiration levels so that current performance is compared with either the past performance of the focal organization or its peers (Washburn & Bromiley, 2012). Reflecting such a backward-looking search model, BTOF generally predicts that firms allocate resources to R&D when the discrepancy between current performance and aspiration levels increases.

Although the backward-looking search model has dominated performance feedback research (Gavetti et al., 2012), scholars have argued that the allocation of resources to R&D reflects a forward-looking search model that requires complex judgments about future prospects (Arrfelt et al., 2013). Rather than being focused on remedying potential deficiencies between past performance and aspirations, the forward-looking search model suggests that firms increase

R&D when performance prospects indicate that their future performance might not be sufficient to meet current targets (Chen, 2008). For instance, financial analysts' estimates pointing towards unsatisfactory prospects might be particularly salient to decision makers due to the estimates' impact on investors' behavior, and the associated negative consequences for firms and their senior executives (e.g., Wiersema & Zhang, 2011). Financial analysts' estimates falling below performance targets represent *negative forward-looking prospects*, which indicate that given current managerial choices, future performance might not be satisfactory to meet set targets. Although empirical evidence seems to support the notion that negative forward-looking prospects trigger problemistic R&D search among firms (Chen, 2008), scholars have suggested that both backward- and forward-looking decision-making processes need to be taken into account because they act in tandem in determining the allocation of resources to R&D (Arrfelt et al., 2013; Chen, 2008). Especially important for understanding the consequences of negative prospects could be when *backward-looking feedback* is positive, which indicates that past managerial choices were able to generate desired levels of performance, because it introduces inconsistency in the performance assessments.

When backward-looking feedback and forward-looking prospects are inconsistent, comparisons of current performance levels relative to those from the past and those foreseen in the future diverge systematically (Hu et al., 2017; Joseph & Gaba, 2015). Hence, internal contradictions between distinct aspects of firm performance make an unequivocal assessment unlikely (Lucas et al., 2018). For instance, when firms are able to achieve their past targets and demonstrate strong performance, stakeholders start extrapolating from past successes and form the opinion that the firm has the right capabilities to deliver similar levels of value (Mishina, Block, & Mannor, 2012). When firms then receive signals of potential failure to meet targets,

such inconsistency in performance feedback may lead to intense debate among those involved in decision making (Desai, 2016; Joseph & Gaba, 2015). Originating from different personal ambitions, interests, and cognitive representations of future states (Allison, 1971; Chen, 2008), divergent preferences for responses may emerge because of dissimilar formal positions and responsibilities. It may raise subjectivity of performance evaluations that may lead to attention shifts among multiple reference points (Greve, 1998; Lucas et al., 2018). Stakeholders, such as other top management team (TMT) members or board of directors (BOD), may try to steer discussions and start using influence tactics to advance their own opinions and interests (Fang, Kim, & Milliken, 2014; Westphal & Bednar, 2008). Earlier studies have suggested that attention shifts and the prioritization of individual rather than organizational goals could lead to negative performance prospects being recoded as temporary, which curbs the tendency to engage in problemistic search (Jordan & Audia, 2012). To deal with the complexity of decision making and the cognitively challenging nature of assessing and responding to inconsistent feedback, research has suggested that decisions makers use decision rules that guide their behavior (Greve, 2003).

In accordance with literatures on heuristics, scholars have broadly categorized two diametrically opposed decision rules; the problem-solving and the self-enhancement rule (Audia & Brion, 2007; Greve, 1998; Hu et al., 2017). Problem-solvers prioritize the negative aspect of the inconsistent feedback and engage in more R&D search (Baum et al., 2005). Indeed, successfully achieving one goal frees up managerial attention and enables the firm to allocate more resources to problemistic search when another goal is not achieved (Hu et al., 2017). Such facets of inconsistent feedback shape decision makers' perceptions of the situation as an opportunity to restore firm performance and motivate them to identify potential solutions through investing in problemistic search (Shimizu, 2007). Self-enhancers, on the other hand, prioritize

the positive aspect of the inconsistent feedback and engage in less R&D search (Audia & Brion, 2007). Concerned with being held responsible for the negative aspect of the inconsistent feedback and motivated to protect their self-image and position, self-enhancers consider the positive part of the inconsistent feedback as an opportunity to hide potential problems and avoid attempts to remedy anticipated performance shortfalls (Audia & Brion, 2007; Jordan & Audia, 2012). Despite earlier studies explicating disparate theoretical logics underlying each decision rule, empirical evidence about which decision rule prevails when dealing with inconsistent feedback has been rather inconclusive. So far, it is rather unclear when decision makers act as problem-solvers or self-enhancers when responding to inconsistent feedback.

CEO Power, Inconsistent Feedback and R&D Search

CEOs are considered to be the most influential decision maker within firms and to play a critical role in explaining firms' actions and performance (Hambrick & Finkelstein, 1987; Quigley & Hambrick, 2015). For instance, studies have shown that CEO attributes and preferences determine strategic investments, changes in organizational structure and cultural values (Hambrick, 2007; Tang, Crossan, & Rowe, 2011). Together with such a consequential role in the firm, comes the fact that CEOs are often being held accountable for firm performance, which could lead to dismissal when the firm is underperforming, or may lead to promotion and pay raise in case of outstanding results (Chen, Luo, Tang, & Tong, 2015; Crossland & Chen, 2013). As such, CEOs might be particularly motivated to shape the ways in which inconsistent feedback about backward- and forward-looking referents is approached and assessed.

Nevertheless, CEOs rarely make critical decisions in isolation and studies have sought to explain how the interactions between CEOs and other TMT members, the BOD as well as other stakeholders may shape decision-making processes regarding performance feedback (Boeker,

1997; Desai, 2016; Fang, Kim, & Milliken, 2014). By so doing, earlier theorizing has demonstrated that power is an inherent component of the performance evaluation process and showed how CEOs may use interpersonal influence tactics to deal with pressures from other senior executives and external constituents (Westphal & Bednar, 2005). Accordingly, we suggest that CEO power, referred to as the CEO's capacity to influence other stakeholders (Finkelstein 1992; Pfeffer, 1981), shapes the way in which firms respond to inconsistent feedback and explains the extent to which either the problem-solving or self-enhancement rule manifests itself in decisions about R&D search. Importantly, power gives opportunities to CEOs but also entails responsibilities (De Wit, Scheepers, Ellemers, Sassenberg, & Scholl, 2017; Williams, 2014). For instance, powerful CEOs have access to valuable resources and tend to be more optimistic about the success of their chosen courses of action (Gupta, Han, Nanda, & Silveri, 2016; Finkelstein, 1992). Therefore, they might have more confidence in solving the problem that has caused the inconsistency in performance feedback and prospects, and intensify R&D search as a result. However, powerful CEOs are also held personally responsible for firm outcomes (Finkelstein & D'Aveni, 1994), which means that they may feel threatened by inconsistencies in performance assessments, and therefore, start engaging in self-enhancement behaviors and steer decision making towards reducing R&D search. A threat to their ability to exercise power and to be in control leads decision makers to act defensively. As such, they may use their power to advance their own interests in order to maintain their position (Deng, Zheng, & Guinote, 2018).

We investigate specific sources of power in order to understand how CEO power affects the choice of problem-solving and self-enhancement rules when CEOs are faced with negative prospects and positive feedback. In the context of strategic decision making, Finkelstein (1992) noted that four types – associated with different sources – of CEO power are critical: structural,

ownership, expert, and prestige power. *CEO structural power* is based on formal organizational structure and hierarchical authority, and defines the interpersonal dynamics within TMTs (Patel & Cooper, 2014). *CEO ownership power* is determined by the CEO's position in the principal–agent relationship, and indicates how the CEO interacts with the BOD and powerful shareholders (Canella & Shen, 2001). *CEO expert power* is derived from the CEO's exposure and relationships with stakeholders within the firm's task environment, such as employees, suppliers and customers (Park & Tzabbar, 2016). Finally, *CEO prestige power* is based on the CEO's reputation and standing within the firm's institutional environment (Finkelstein, 1992). Each of the four types of power can be classified along broader categories of power including 'harsh' versus 'soft' power or 'control' versus 'persuasive' power (Raven, Schwarzwald, & Koslowsky, 1998; Turner, 2005). In this respect, CEO structural and ownership power are considered to be 'harsh' or 'control' concepts of power, that arise from formal positions within the organization and give CEOs legitimate authority to control the behavior of others. On the contrary, CEO expert and prestige power can be defined as 'soft' or 'persuasive' concepts of power that emerge from personal characteristics of individuals such as superior knowledge, experience, background and mutual relationships (Raven et al., 1998).

Overall, we expect powerful CEOs to problem-solve when the source of their power provides them with opportunities to influence others in such a way that addressing inconsistent feedback does not threaten their position and self-image. Rather, we argue that CEOs tend to self-enhance when their source of power does not provide such opportunities and inconsistent feedback threatens their position, or when they lack confidence that they are able to address inconsistent feedback in an effective way. Our theoretical model is summarized in Figure 1.

Insert Figure 1 about here.

CEO structural power. The concentration of power in a firm's CEO has been shown to lead to more biased attributions of information (Fulmer & Gelfand, 2012), which might facilitate self-enhancement attempts in dealing with inconsistent feedback. In addition, TMT members tend to engage in political behaviors and to start secretly building coalitions in order to enhance their influence (Eisenhardt & Bourgeois, 1988). Earlier research has revealed that such a politicized context may weaken social bonds and interrupt habitual cooperation based on trusted relationships within TMTs. This reduces the willingness of decision makers to share private information, which could negatively impact problem-solving and increase the tendency of powerful CEOs to underweight advice from others (Tost, Gino & Larrick, 2012). CEO structural power thus paralyzes constructive debate during which openly questioning the effectiveness of organizational behavior is deemed inappropriate (McNulty & Pettigrew, 1999; Park, Westphal, & Stern, 2011) and self-enhancement is more likely to occur. Given the more stringent set of cognitive and social resources that is dedicated to the evaluation process, decision makers are more constrained when assessing inconsistent feedback and identifying alternative responses (Abebe, Angriawan, & Liu, 2011; Fulmer & Gelfand, 2012; Tang, Crossan & Rowe, 2011). Such cognitive constraints may prime structurally powerful CEOs to perceive threats to their self-image because of concerns that the identified solution for R&D search will be insufficient to align future prospects with past successes (Shen & Cannella, 2002; Zhang, 2006). In order to safeguard their powerful position, we argue that such CEOs become more inclined to shift attention away from goals related to collective improvements and problem-solving efforts to those related to their self-enhancing interests (Bunderson & Reagans, 2011).

In order to reduce complexity of decision making and weakening of their own position in the assessment of inconsistent feedback, structurally powerful CEOs would use their power to control the TMT's strategic agenda (Zhang, 2006). They may distort available information by putting counterfactual aspects on the agenda (Shen & Cannella, 2002). Also, they may monitor more closely discussion about issues such as future growth in demand or the impact of technological change, so that the resulting assessments of future prospects are compatible with their own self-enhancing interests (Jordan & Audia, 2012). Hence, by scheduling topics and manipulating assessments, structurally powerful CEOs may protect their position by shifting the performance evaluation process from negative prospects to positive performance feedback. Overall, we suggest that structurally powerful CEOs prompt self-enhancing assessments of inconsistent feedback and avoid R&D investments.

Hypothesis 1: A greater inconsistency between positive performance feedback and negative performance prospects will result in less R&D search when the firm's CEO has more structural power.

CEO ownership power. Although CEO ownership has been associated with a greater alignment between the interests of the CEO and other shareholders (Hoskisson, Hitt, Johnson, & Grossman, 2002), significant levels of equity and voting rights of CEOs reduce the influence of the BOD and enables CEOs to exercise more discretion in decision making (Finkelstein, 1992; Finkelstein & D'Aveni, 1994). Additionally, significant ownership links the wealth, status, and career of CEOs more tightly to how firm performance is assessed by others (Gentry & Shen, 2013; Hoskisson et al., 2002). As such, ownership power bears higher risks on CEOs when their firm might fail (Lange, Boivie, & Westphal, 2015), suggesting that such CEOs might be prone to engage in self-enhancement as a way to avoid losses related to potential negative interpretations

of the inconsistent feedback by the BODs and shareholders. Higher ownership, indeed, may provide CEOs with control over strategic actions that are compatible with their own interests (Johnson, Hoskisson, & Hitt, 1993) and ultimately distract the BODs and other stakeholders from problem-solving attempts in order to deal with negative prospects.

When faced with inconsistencies between past success and negative prospects, we argue that CEOs with significant firm ownership try to ensure that outsiders interpret inconsistent feedback more positively in order to retain their authority in decision making. Having invested substantial time and effort in advancing the firm, CEOs can use their information advantage over outsiders to self-enhance when receiving inconsistent feedback (Feldman & Montgomery, 2015; Kroll, Walters, & Le, 2007). For instance, they may present negative prospects to be temporary in nature and non-threatening to the future performance of the firm, thereby preventing investors from publicly voicing their concerns and dissatisfaction (Westphal & Bednar, 2008). Rather than signaling that something may be wrong and allocating more resources to R&D search, we argue that CEOs with higher ownership power tend to shift the BOD's attention to past successes of the firm and prevent their active involvement in decision making. They may emphasize the rightfulness of their previous choices by using tactics such as share buybacks (Benner & Ranganathan, 2012; Sanders & Carpenter, 2003) and demonstrate their confidence in current organizational strategies. Moreover, they could use their voting rights to enforce commitment to practices that have been shown to be successful, and persist with current R&D resource allocation decisions, since doing so could further enhance their authority (Haynes & Hillman, 2010). We argue therefore that CEOs with significant ownership power tend to self-enhance when confronted with inconsistent feedback and to prevent potential losses to their socio-economic wealth (George, Wiklund, & Zahra, 2005). They highlight past successes in order to

shift attention to positive assessments of the inconsistent feedback and present current actions to be aligned with the shareholder interests at the expense of R&D search. As such, we expect:

Hypothesis 2: A greater inconsistency between positive performance feedback and negative performance prospects will result in less R&D search when the firm's CEO has more ownership power.

CEO expert power. Expert power helps CEOs to safeguard support from important constituents in their task environment (Finkelstein, 1992), which makes inconsistent feedback less threatening for them and for the firm. Indeed, the more CEOs interact with other stakeholders, the less important performance signals become in defining their relationship (Bunderson, 2003). This means that CEOs with a high level of expert power who have interacted extensively and have developed relationships with a variety of stakeholders are less dependent on positive assessment of firm performance in order to ensure mutual cooperation and commitment in the future (Choi & Wang, 2009). As such, CEOs with higher expert power may consider self-enhancement as less relevant or even counterproductive when dealing with inconsistent feedback because it may undermine established relationships with different stakeholders (Barney & Hansen, 1994). Using self-enhancement tendencies during evaluation processes could potentially damage stakeholder loyalty and put social relations, and thus the position of the CEO possessing expert power, at risk. We argue therefore that CEOs with high levels of expert power consider addressing problems and being transparent about R&D search as a way to negotiate a more favorable outcome for the firm by stressing that getting the firm back on track will be mutually beneficial.

Furthermore, expert power helps CEOs to ensure the quality of information used when assessing inconsistent feedback and enhances their confidence in addressing shortcomings when

engaging in R&D search. Expert power enables CEOs to gain access to trustworthy and industry-specific information through ties with important stakeholders from the task environment (Dyer & Chu, 2003; Kor & Sundaramurthy, 2009). Therefore, CEOs with expert power feel more confident about resolving debates with stakeholders following inconsistent feedback, and will therefore engage more readily in R&D search in order to take advantage of specific opportunities which can address negative parts of the inconsistent feedback and reverse the future prospects. In addition, CEOs with expert power have more hands-on experience (McDonald, Westphal, & Graebner, 2008) and tend to possess a more holistic understanding of difficult problems, which allows them to better estimate both the costs and benefits involved when pursuing problemistic search and solving problems associated with negative prospects (Park & Tzabbar, 2016). They feel better equipped to solve underlying problems associated with the inconsistent feedback because they have a better understanding of the potential of the opportunities identified. Thus, unlike CEOs with less expert power, whose firms invest less in R&D search to test the identified solution, those CEOs with expert power will have their firms to commit additional resources to R&D search in order to address the inconsistent feedback in a problem-solving way.

Hypothesis 3: A greater inconsistency between positive performance feedback and negative performance prospects will result in more R&D search when the firm's CEO has more expert power.

***CEO prestige power*.** Prestige power is often seen as an asset for CEOs because it provides access to scarce resources, high-quality information and advice from prestigious peers (Chen, Hambrick, & Pollock, 2008; Flickinger, Wrage, Tuschke, & Bresser, 2016). These benefits may assure prestigious CEOs that they are in control over the outcomes of debates and diverging opinions during the assessment of inconsistent feedback. Such CEOs tend to perceive

positive feedback and negative prospects as less challenging than less prestigious CEOs (Campbell & Sedikides, 1999; Sedikides & Strube, 1997), because they perceive the negative part of inconsistent feedback to be correctable. Suggestions about how to address inconsistent feedback made by CEOs with a high level of prestige power are also received more positively (Levine & Moreland, 1990), which provides prestigious CEOs with additional confirmation that the outcomes of R&D search will be regarded by others as useful and important to address negative prospects. They feel more capable to improve future performance by intensifying R&D search when confronted with inconsistent feedback than those with less prestige power.

Prestigious CEOs are also more strongly motivated to safeguard their prestige (Marr & Thau, 2014). When they are faced with inconsistent feedback in which past success is recognized but future failure is anticipated, their motivation to protect their social standing is likely to be stronger because negative prospects reduce their status and prestige (Withers, Corley, & Hillman, 2012). More specifically, prestigious CEOs are part of an elite network, whose members want to preserve their exclusivity and status, which they do via monitoring and helping each other to ensure high standards of decision making (Acharya & Pollock, 2013; Davis, Yoo, & Baker, 2003). Constructing a favorable self-image in the event of inconsistent feedback can make CEOs seem dishonest or unreliable and may damage their social prestige (Cialdini & De Nicholas, 1989). We envision that such damage will be greater for prestigious CEOs because they are expected to demonstrate higher moral standards and to address potential drops in forward-looking prospects (Wang, Wezel, & Forgues, 2016). Thus, the higher the prestige power of CEOs, the more shifting attention away from future performance problems may put them at risk of losing their social standing. Rather, by addressing the problems underlying inconsistent feedback, they may protect their social standing (Krishnan & Kozhikode, 2015; Park & Podolny,

2000). Hence, we expect that decision makers at firms with prestigious CEOs will scrutinize inconsistent feedback, and intend to respond to it by increasing R&D search.

Hypothesis 4: A greater inconsistency between positive performance feedback and negative performance prospects will result in more R&D search when the firm's CEO has more prestige power.

METHODS

Sample and Data

Our initial sample consisted of all S&P 500 firms between 2002 and 2014. Data on firms and industries were collected from COMPUSTAT, CRSP and KLD, the data on CEOs, TMTs, BODs and investors from Execucomp, BoardEx and ISS, and the data on financial analysts' forecasts, used to compute the performance prospects, from I/B/E/S. Following previous studies, we excluded firms within industries (i.e., based on four-digit Standard Industrial Classification (SIC) codes) in which there were less than five competitors so as to limit the influence of a single firm on the computation of industry-level variables (Chen, 2008). Firms from financial services (SIC 60–69), utilities (SIC 40, 48 and 49) and unidentified industries (SIC 99) were also excluded. Finally, we left out firms whose R&D expenditure exceeded their sales, because such firms might be research firms and exhibit different investment behaviors (Chen, 2008). The final sample consisted of 241 firms and 1887 firm-year observations.

Measures

R&D search. Following earlier studies, we measured R&D search as the ratio of R&D spending to sales[1] (Chen, 2008). Since firms are not required to report R&D spending which is

[1]Scholars have raised concerns about using ratios as dependent variables (Certo, Busenbark, Kalm, & LePine, 2018). We decided, however, to stick to previous operationalizations of R&D search as a ratio for two reasons. First, R&D intensity and R&D spending are two different theoretical constructs (Bromiley, Rau, & Zhang, 2017) and performance feedback affects each of these activities in completely opposite ways (Bromiley & Washburn, 2011).

less than ten percent of sales and general administrative expenses, we replaced non reported, e.g. missing, values for R&D spending with zero and included a dummy variable for missing R&D in our analysis to control for such replacement (Benner & Ranganathan, 2012). To test the robustness of our measure, we employed alternative operationalizations of our dependent variable where R&D search was based only on non-missing values of R&D spending or captured by an index which also incorporated acquisition spending and capital expenditures (Iyer & Miller, 2008; Souder & Bromiley, 2012), and our results remained qualitatively the same. We elaborate on those robustness tests in the Results section.

Inconsistency between performance feedback and performance prospects. We adopted the measures from Chen (2008) to compute performance *feedback* and performance *prospects*. Feedback was measured as the difference between past performance (*t*-1) and aspiration (*t*-1). We employed return on assets (ROA), i.e., the ratio of net income to total assets, as a measure of performance because it had been widely used in previous studies. Aspiration (*t*-1) was computed as a weighted combination of past performance at *t*-2 (weight of 0.6) and past performance at *t*-3 (weight of 0.4), because firms tend to rely more heavily on recent performance measures when forming their aspirations (Chen, 2008). Prospects was measured as the difference between performance expectations (*t*+1) and current target (*t*). Financial analysts provide performance forecasts for firms, which are based on careful examination of the focal firm, its competitors and industry trends (Wiersema & Zhang, 2011), and these forecasts have been used as an indicator of performance expectations (Chen, 2008). First, we took the average of the last earnings per share (EPS) forecast of each analyst who had issued forecasts for each firm for year *t*+1 in year *t*. We

Second, choosing R&D intensity allowed us to compare our results to many other studies concerned with the effect of performance feedback on R&D search (e.g., Chen, 2008; Lucas et al., 2018), and it was most closely aligned with the predictions of the BTOF (Bromiley & Washburn, 2011).

then computed the expected ROA *t*+1 by multiplying the average forecasted EPS *t*+1 by the shares outstanding and dividing it by the total assets. Target was computed in a way that reflected the notion that decision makers develop targets based on a historical time series of performance trends (Chen, 2008). As such, current target was the predicted ROA *t* after ROA *t* had been regressed on past ROA from time *t*-1 to *t*-3 (Chen, 2008).

We then separated the performance assessment effects into negative and positive (Chen, 2008). *Negative feedback* was the absolute difference between the firm's past performance and aspiration when the performance was below the aspiration, and zero otherwise. *Positive feedback* was the absolute difference between the firm's past performance and aspiration when the performance was above the aspiration, and zero otherwise. *Negative prospects* was the absolute difference between the firm's future performance expectation and current target when the performance expectations were below the target, and zero otherwise. *Positive prospects* was the absolute difference between the firm's future performance expectation and current target when the performance expectations were above the target, and zero otherwise. As such, higher values for the negative feedback/prospects indicated more negative values and higher values for the positive feedback/prospects indicated more positive values. All four feedback and prospect variables were winsorized at the 0.5%-level to avoid some extreme outliers and enable us to still keep the observations as part of our sample. The effect of inconsistent feedback in the case of *negative prospects* and *positive feedback* was studied by including an interaction term between the two variables. We also controlled for the alternative scenario of inconsistency between *positive prospects* and *negative feedback* by including a second interaction term.

***CEO structural power*.** We measured CEO structural power as an index of the sum of four standardized components, namely (1) CEO duality, measured as one if the CEO also served

as the chair of the BOD, and zero otherwise, (2) the number of non-CEO TMT members, who sat on the BOD (reversed) (3), title inequality and (4) pay inequality (Daily & Johnson, 1997; Finkelstein, 1992; Patel & Cooper, 2014). Title was a count measure based on information available in Execucomp about the different titles that each TMT member held. Pay was the natural logarithm of total compensation received by each TMT member; tdc1 variable from Execucomp was used for total compensation. Inequality was measured as:

$$\left(\sum_{i=1}^{n}\frac{(S_i - S_j)^2}{n}\right)^{1/2}$$

where S_i was the CEO's titles/pay, S_j was the title/pay of non-CEO TMT member *j*, and *n* was the number of non-CEO TMT members. Following other studies, we considered TMT members, including the CEO, to be the five highest paid executives within the firm (e.g., Ridge, Aime, & White, 2015).

***CEO ownership power*.** We measured CEO ownership power as an index of the sum of two standardized components, namely (1) whether the CEO was a founder of the firm, coded as one if the CEO was, and zero otherwise, and (2) the CEO ownership percentage as a proportion of the summed ownership percentage of outside directors and institutional block-holder investors, namely institutional investors who owned at least five percent of the total firm stock (Canella & Shen, 2001; Finkelstein, 1992).

***CEO expert power*.** CEO expert power was measured as an index of the sum of three standardized components, namely (1) CEO tenure in the firm, (2) the number of roles that the CEO had in the firm, and (3) the number of functional areas in which the CEO had served the firm (Daily & Johnson, 1997; Finkelstein, 1992). We used previously identified functional areas: (a) production and operations, (b) R&D and engineering, (c) accounting and finance, (d)

management and administration, (e) marketing and sales, (f) law, (g) personnel and labor relations (Patel & Cooper, 2014).

***CEO prestige power*.** We measured CEO prestige power as an index of the sum of three standardized components, namely (1) the number of public boards the CEO sat on, (2) the number of non-profit boards the CEO sat on, and (3) whether the CEO had an elite education, which was coded as one if the CEO had a degree from an elite institution, and zero otherwise (Finkelstein, 1992). The list of elite institutions was adopted from Gomulya and Boeker (2014).

Control variables. We included several variables for firms, CEOs, BODs, industries and time that could have an effect on R&D search and/or the performance feedback and prospects variables. We included a lagged dependent variable, which allowed us to capture the effects of routine planned investments (Benner & Ranganathan, 2012). It also helped us to cope with autocorrelation in the error term. Other firm control variables were firm size, which could affect the firm's capabilities and preferences for investments, and firm growth, based on sales growth over the past three years, which could shift perceptions regarding the benefits of R&D intensity. We also included financial slack, measured by an index composed of two firm-standardized ratios: current assets to current liabilities, and working capital to sales (Chen, 2008).

We further controlled for alternative uses of cash such as firm dividends per share (DPS) and share repurchases (the natural logarithm of the value of purchase of common and preferred stock), which could affect decisions about R&D search (Benner & Ranganathan, 2012). We also included a measure of earnings management based on discretionary accruals, which could be used to boost short-term results (Zang, 2011). Earnings management was based on a modified Jones (1991) model run for each year-industry combination, and it was proxied by the residual from regressing total accruals (being the earnings before extraordinary items and discontinued

operations minus operating cash flows) on the change in revenues from the preceding year and the gross value of property, plant and equipment, all scaled by firm total assets (Zang, 2011).

To allow us to better isolate the effect of CEO expert power and CEO prestige power, we also controlled for firm reputation among stakeholders and firm status. To compute firm reputation with stakeholders we used data from KLD. We standardized the number of strengths and concerns on six dimensions and subtracted the total number of concerns from the total number of strengths to derive the reputation with stakeholders index (Choi & Wang, 2009). The six dimensions were community relations, employee relations, diversity, human rights, environment, and product. To proxy for firm status, we used the residual from regressing analyst coverage, which was the natural logarithm of the number of financial analysts providing forecasts for the focal firm for a particular fiscal year, on established predictors from previous research. The predictors we used in the regression were firm size (natural logarithm of total assets), ROA, returns volatility (standard deviation of daily stock returns over the fiscal year) and cumulative stock returns of the firm over the fiscal year (Shen, Tang, & Chen, 2014).

We controlled for CEO age and gender. We also included CEO overconfidence employing a measure based on CEO option exercise behavior. Research has shown that CEOs sell exercisable options when they are not confident about the future prospects of the firm (Devers, McNamara, Haleblian, & Yoder, 2013). We therefore classified CEOs as overconfident if they had kept their exercisable stock options when the stock price was at least 67% higher than the exercisable price at least twice in the period from the beginning of their tenure as CEO until the focal year (Chen et al., 2015; Malmendier & Tate, 2005). We also included the CEO long-term pay mix, being the proportion of total compensation paid in long-term forms such as long-term incentive plans, stock options and restricted stock (Sanders & Carpenter, 1998). Some

important board-related variables, which could be consequential for board monitoring and thus for opportunities to self-enhance, were board size (the logarithm of the number of directors) and board independence (the proportion of independent directors) (Desai, 2016).

We also controlled for the median industry R&D search (Chen, 2008), industry-based managerial discretion (Chen, Crossland, & Luo, 2015) and environmental uncertainty (Arrfelt et al., 2013). Managerial discretion was an index of the sum of four standardized components based on four-digit industry SIC codes, namely (1), average industry capital intensity, being the net value of property, plant and equipment divided by the firm total assets (reversed) (2), average industry advertising intensity, being the advertising expenses divided by sales (3) industry munificence, and (4) industry concentration (reversed) (Chen et al., 2015). Industry munificence was operationalized by first regressing time against industry sales for a five-year period preceding the year of interest, and then scaling the regression coefficient by the average industry sales used in the regression. Industry competitiveness was measured via the Herfindahl index. Environmental uncertainty was measured by the standard error of the regression coefficient of time instead of the coefficient itself (Arrfelt et al., 2013).

Time effects, i.e., year dummies, were included to control for macroenvironmental changes that may affect the whole panel of firms. The estimation method also controlled for firm fixed effects. All independent, moderator and control variables were lagged one year, except for prospects, missing R&D, share repurchases, and earnings management. Moreover, all independent and moderator variables were centered to prevent multicollinearity.

Analysis

Due to the correlation between the unobserved fixed effects and the lagged dependent variable, the inclusion of past values of R&D search made standard estimators inconsistent.

Arellano and Bond (1991) derived a consistent generalized method-of-moments estimator, appropriate for use in such cases. We therefore used the Arellano–Bond dynamic panel estimator. We treated all predictors in the model as endogenous and estimated them by means of instrumental variables, using past values of the regressors as instruments.

RESULTS

Table 1 presents the descriptive statistics and correlations for the study variables. Table 2 presents the results of the Arellano–Bond one-step estimator for R&D search. All variance inflation factors were less than 5.07, meaning that multicollinearity was not a problem for interpreting the results. In all models, the assumptions of the Arellano–Bond estimator were met. Namely, no second-order autocorrelation was present, since the AR(2) tests for all models were not significant. The instruments used were valid; they were correlated with the endogenous variables but not with the error terms, as indicated by the non-significance of the Hansen and the difference-in-Hansen tests. The chi-square statistic for all models was significant.

Insert Tables 1 and 2 about here.

Model 1 in Table 2 presents the base model, which included the interaction term of negative prospects and positive feedback, representing the effect of inconsistent feedback on R&D search. It also included all the direct effects of prospects and feedback, the moderators and control variables, as well as the alternative interaction term of positive prospects and negative feedback, for which we controlled. Several variables were significant in Model 1. The coefficient of CEO structural power was negative and significant (b = -0.003, p < .01). The coefficients of financial slack (b = 0.10, p < .05) and industry R&D search (b = 1.36, p < .00) were both positive and significant. The interaction term of positive prospects and negative feedback, the alternative

scenario of inconsistent feedback, was negative and significant (b = -6.45, p < .05), which is consistent with the findings of Chen (2008). On average, the firms in our sample engaged in less R&D search when past performance was unsatisfactory but future prospects seemed good, meaning that they engaged more in self-enhancement in this specific scenario. More negative feedback (by 1 SD = 0.04) resulted in 0.012 less R&D search when firms experienced more positive prospects (+1 SD = 0.04) and 0.008 more R&D search when they experienced less positive prospects (-1 SD = -0.04).

The interaction term of negative prospects and positive feedback, our main variable of inconsistent feedback, was positive and significant (b = 66.95, p < .01). This meant that on average, decision makers in our sample engaged in more problem-solving and invested more in R&D search when past performance was good but they anticipated performance shortfalls. More negative prospects (by 1 SD = 0.01) resulted in 0.057 more R&D search when firms experienced more positive feedback (+1 SD = 0.04) and only 0.004 more R&D search when they experienced less positive feedback (- 1 SD = -0.04). The difference of 0.053 in expected R&D search as a result of a change in the negativity of firm prospects when the past feedback was less versus more positive could serve as a baseline when studying the impact of our contingency variables.

Hypothesis Testing

We added the three-way interactions and the required two-way interactions between negative prospects, positive feedback and the moderators, i.e., CEO structural power, CEO ownership power, CEO expert power, and CEO prestige power in Models 2, 3, 4, and 5, respectively. We controlled for the effect of the alternative scenario of inconsistent feedback, i.e., positive prospects and negative feedback, which we further discuss in our supplementary analysis. Moreover, we present a full model with all three-way interactions for completeness in

Model 6. Nevertheless, we use the partial models for testing our hypotheses because of inherent challenges of interpretation and statistical power as well as multicollinearity when all three- and two-way interaction terms are included in an estimation model.

The coefficient for the three-way interaction between negative prospects, positive feedback, and CEO structural power was negative and significant (Model 2, b = -23.30, $p < .05$), supporting Hypothesis 1. The coefficient for the three-way interaction between negative prospects, positive feedback, and CEO ownership power was negative and significant (Model 3, b = -56.88, $p < .05$), supporting Hypothesis 2. The coefficient for the three-way interaction between negative prospects, positive feedback, and CEO expert power was significant but negative (Model 4, b = -15.29, $p < .05$), which indicated that more inconsistent positive feedback and negative prospects resulted in more R&D search when the firm's CEO had *less* rather than *more* expert power, which is the opposite of what we predicted. Hypothesis 3 was therefore rejected. The coefficient for the three-way interaction between negative prospects, positive feedback, and CEO prestige power was positive and significant (Model 5, b = 45.86, $p < .01$), supporting Hypothesis 4.

Interaction Plots and Effect Sizes

Figures 2 to 5 depict the three-way interactions in which we plotted the slopes of negative prospects in the range of one SD below and above the mean. Figure 2 shows that CEOs with low structural power increased R&D search more when the negative prospects and positive feedback became more inconsistent, i.e., when the positive feedback shifted from less to more positive (simple slope difference t = 2.77, $p < .01$), compared to CEOs with high structural power for whom the shift did not make a difference (simple slope difference t = 1.10, *n.s.*). When negative prospects dropped by one SD, CEOs with low structural power increased R&D search by 0.065

if they faced more positive feedback (b = 6.48, p < .001) but made no significant changes if the feedback was less positive (b = -0.60, *n.s.*). In comparison to the baseline difference of 0.053 (as calculated before), 0.065 represented a 22.6% further increase in the expected R&D search as a result of the growing inconsistency between positive feedback and negative prospects when CEOs had little structural power. Even though the difference between slopes of negative prospects and less versus more positive feedback was not statistically different for structurally powerful CEOs, it is worth mentioning that the slope of negative prospects and more positive feedback was positive and significant (b = 3.40, p < .01), while the slope of negative prospects and the less positive feedback was not significant (b = 1.49, *n.s.*).

Figure 3 shows that CEOs with low ownership power invested more in R&D search when the negative prospects and positive feedback became more inconsistent (simple slope difference t = 2.73, p < .01) compared to CEOs with high ownership power for whom the shift did not make a difference (simple slope difference t = 0.52, *n.s.*). When negative prospects dropped by one SD, CEOs with low ownership power increased R&D search by 0.061 if they faced more positive feedback (b = 6.07, p < .01) but made no significant changes if the feedback was less positive (b = -1.87, *n.s.*). In comparison to the baseline relationship, 0.061 represented 15.1% increase in the expected R&D search as a result of greater inconsistency between positive feedback and negative prospects when CEOs had less ownership power.

Figure 4 shows that CEOs with low expert power increased R&D search more when the negative prospects and positive feedback became more inconsistent (simple slope difference t = 2.84, p < .01) compared to CEOs with high expert power for whom the shift was not significant (simple slope difference t = 0.36, *n.s.*). When negative prospects dropped by one SD, non-expert CEOs increased R&D search by 0.056 if they faced more positive feedback (b = 5.58, p < .001)

but made no changes if the feedback was less positive (b = -0.31, *n.s.*). In comparison to the baseline effect, 0.056 represented 5.7% increase in the expected R&D search as a result of the rising inconsistency between positive feedback and negative prospects when CEOs had less expert power. When negative prospects dropped by one SD, CEOs with expert power increased R&D search by only 0.028 if they faced more positive feedback (b = 2.80, p < .01) and slightly less if the feedback was less positive (b = 2.33, p < .10), yet the difference was minimal.

Lastly, Figure 5 shows that CEOs with high prestige power invested more in R&D search when the negative prospects and positive feedback became more inconsistent (simple slope difference t = 3.80, p < .001) compared to CEOs with low prestige power for whom the shift was not significant (simple slope difference t = -0.68, *n.s.*). When negative prospects dropped by one SD, prestigious CEOs increased R&D search by 0.078 if they faced more positive feedback (b = 7.75, p < .001) but made no significant changes if the feedback was less positive (b = -2.10, *n.s.*). CEO prestige power thus boosted the baseline difference of the expected R&D search by 47.2% when the positive feedback and negative prospects became more inconsistent.

Insert Figures 2, 3, 4, and 5 about here.

Post-Hoc Analysis of the Moderating Effect of CEO Expert Power

We conducted a post-hoc analysis to test some alternative explanations with regards to the surprising finding that CEO expert power had affected the relationship between positive feedback, negative prospects, and R&D search in the opposite way to what we had expected. First, we tested whether the different components reflecting CEO expert power show diverging effects on the relationship between inconsistent feedback and R&D search. To do that, we tested the moderating effects of the three components of CEO expert power separately on the

relationship of between inconsistent positive feedback and negative prospects, and R&D search. Our models, however, showed that the three components of CEO expert power demonstrated consistent moderation effects, namely the coefficients of the three-way interactions with CEO tenure in the firm (b = -4.39, p < .01) and the number CEO functions in the firm (b = -26.23, p < .05) were negative and significant albeit slightly weaker for the number CEO roles in the firm (b = -6.64, p < .10).

Second, we examined whether what shapes the CEO's expert power in dealing with inconsistent feedback and engaging in more R&D search is not associated with the number of close relationships with stakeholders in general but rather with specific groups of stakeholders in particular. For example, CEOs who have performed a sales and marketing function might have a better understanding of important customers and have developed trusting relationships with them, which could provide access to information about the market or competitive offerings (Buyl, Boone, Hendriks, & Matthyssens, 2011). To examine this alternative explanation, we created seven dummies corresponding to the seven functional domains of the CEO within the firm. Each dummy took the value of one if the CEO had performed it, and zero otherwise, except for the management and administration function, which was one when the CEO had performed only that function within the firm, and zero otherwise. Controlling for expertise power, we ran seven different models in which we added to Model 1 the three-way interactions between negative prospects, positive feedback, and each of the dummy function variables. Only the three-way interaction with the marketing and sales dummy was positive and significant (b = 108.01, p < .001). The other three-way interactions were negative and significant, i.e., the one with the management and administration only dummy (b = -94.77, p < .001), and the ones with the production-operations dummy (b = -99.30, p < .001), accounting and finance dummy (b = -

76.93, $p < .01$), law function ($b = -65.88$, $p < .05$), and personnel and labor relations dummy ($b = -98.13$, $p < .01$), except for the R&D and engineering dummy, which was just marginally significant ($b = -46.69$, $p < .10$). The post-hoc analysis suggests that only CEOs who have sales and marketing background invest more in R&D search when faced with more divergent negative prospects coupled with past success. Although these findings indicate the importance of considering specific functional domains in which CEOs have expert power, results should be regarded with caution because some functions were under-represented in our sample.

Robustness Checks

We performed several robustness checks with an alternative configuration of inconsistent feedback, (sub)samples and a different dependent variable. The results are available on request.

Alternative configuration of inconsistent feedback. The interaction effects of the alternative configuration of inconsistent feedback, negative feedback and positive prospects, were not significant for the contingency variables in our study. That is, the three-way interactions with CEO structural power (Model 2, $b = 0.47$, *n.s.*), CEO ownership power (Model 3, $b = 1.47$, *n.s.*), CEO expert power (Model 4, $b = -0.26$, *n.s.*), and CEO prestige power (Model 5, $b = 1.43$, *n.s.*) were not significant. An interesting observation emerged though in terms of effect signs. CEO structural and ownership power had an opposite impact in terms of how the alternative configuration of inconsistent feedback – i.e., negative feedback but positive prospects – affected R&D search, because the signs of the three-way interactions were positive rather than negative. In addition, CEO expert and prestige power seemed to have a similar impact on the effect of both configurations of inconsistent firm's past feedback and future prospects on R&D search.

Alternative (sub)samples. First, although we restricted our main sample to firms within four-digit SIC industries with a minimum of five competitors, findings remained consistent when

we included firms from industries with fewer than five competitors (N = 1921). Second, we assumed that missing values of R&D were zero, and replaced them accordingly. Including firms that explicitly reported their R&D spending and excluding ones that did not, produced the same results (N = 1387). Lastly, many studies that are based on the BTOF have considered only manufacturing firms (SIC 2000–3999). We did the same, running our analysis on a subsample of S&P 500 firms from manufacturing industries only and our results did not change (N = 1057).

Alternative dependent variable. Given the variety of industries represented in our sample, we allowed for the possibility that the firms might have engaged in problemistic search with different types of investment. Thus, we composed an index by standardizing and summing three types of search investment, which have been found relevant in previous studies – i.e., R&D spending, capital spending and acquisition spending (all scaled by sales) (Iyer & Miller, 2008; Sanders & Hambrick, 2007; Souder & Bromiley, 2012). Findings based on this alternative dependent variable show consistent results (N = 1887).

DISCUSSION

We built a contingent model to examine how CEOs acted upon a growing inconsistency between negative prospects and positive feedback. While firms on average increased R&D search when the positive backward-looking feedback and the negative forward-looking prospects became more inconsistent, different source of CEO power greatly affected such tendencies. We found that CEOs engaged in more self-enhancement and less R&D search when they had more structural power or ownership power. In contrast, CEOs with a high level of prestige power acted as problem-solvers and engaged in more R&D search after receiving more inconsistent feedback. Even though we anticipated that expert power would encourage CEOs to make more problem-solving attempts when dealing with inconsistent feedback, we found the opposite result. Our

post-hoc analysis revealed that only CEOs who had developed expertise in marketing and sales within the firm increased R&D search when feedback became more inconsistent. Overall, these findings suggest important implications, and suggest avenues for future research.

Theoretical Implications

Our theory advances research on how decision makers deal with inconsistent feedback (Audia & Brion, 2007; Joseph & Gaba, 2015). Although earlier research has explicated two decision rules, i.e. self-enhancement and problem-solving (Audia & Brion, 2007; Baum et al., 2005; Hu et al., 2017; Joseph & Gaba, 2015; Lucas et al., 2018), empirical evidence about which decision rule prevails during the assessment of inconsistent feedback has been inconclusive. Our study provides an important first attempt to reconcile disparate theoretical perspectives by examining *when* problem-solving or self-enhancing tendencies surface when responding to inconsistent feedback. We provide important implications for our understanding about the conditions under which decision-makers may increase or reduce R&D search when receiving positive performance feedback and negative prospects.

Our findings forward research on the intersection between the BTOF and self-enhancement theory (Jordan & Audia, 2012) by revealing that different types of CEO power provoke specific dynamics between the CEO and different stakeholders during the assessment of inconsistent feedback. Importantly, we reveal that higher levels of structural and ownership power serve as a tool for promoting self-enhancing assessment of inconsistent feedback (Fang et al., 2014; Lim, 2015; Desai, 2016), yet our findings also suggest that CEO prestige power promotes problem-solving behaviors during the assessment of inconsistent feedback. Overall, thus, our findings imply that ‘harsh’ or ‘control’ categories of CEO power are not instrumental to resolve performance-related problems, because they shift the preferences of CEOs towards

prioritizing their personal interests and self-enhancement. However, ‘soft’ or ‘persuasive’ categories of CEO power ensure support, loyalty and commitment from other stakeholders, which makes CEOs more confident to consider mutually beneficial outcomes when confronted with inconsistent feedback and show preference for problem-solving.

Our non-finding and post-hoc analysis with respect to the contingency effect of CEO expert power have important implications for research on decision making within the upper echelons (Bunderson, 2003; Buyl et al., 2011). First, only a few scholars have touched upon the implications of making a distinction between generalist and specialist CEOs for strategic decision making, and even fewer have considered specific functional expertise (e.g., Kor & Misangyi, 2008; Merluzzi & Phillips, 2016). Our unexpected finding that CEOs’ function-based expertise provides more useful insights about how firms respond to inconsistent feedback than more broadly defined firm-specific expertise, implies that scholars studying this phenomenon in the context of CEOs, TMTs and directors should pay closer attention to the former type of expertise rather than the latter. Second, our post-hoc findings imply that scholars interested in how TMT functional diversity affects decision making could benefit from understanding better which specific functions are over- or under-represented within TMTs, rather than focusing on the level of diversity per se.

Our empirical findings also advance research on the consequences of forward- and backward-looking performance assessments (Chen, 2008; Gavetti & Levinthal, 2000). For instance, scholars have suggested that forward- and backward-looking performance assessments might be equally important in driving search behavior and organizational change (Chen, 2008; Gavetti & Levinthal, 2000). Our findings that decision makers increased R&D search more when faced with positive feedback and negative prospects but decreased it when feedback was

negative and prospects were positive imply that decision makers seem to pay greater attention to forward- rather than backward-looking performance assessments. This implies that scholars should pay greater attention to the consequences of performance expectations for strategic decision making. Finally, while scholars have suggested that the inconsistent feedback configuration might matter for how decision makers respond to it (Lucas et al., 2018), most studies have focused on backward-looking feedback contradictions. Our findings extend previous knowledge and suggest that scholars interested in how decision makers respond to inconsistencies between forward- and backward-looking performance assessments should consider their configuration because responses in this specific context vary.

Practical Implications

Our findings have important implications for corporate governance. Our results show that CEOs with less structural power invested 22.6% more in R&D search when the feedback became more inconsistent, and those with less ownership power, increased their investment by 15.1%. This implies that external monitoring bodies could pay more attention to CEOs' decisions about R&D search when the CEO has more structural or ownership power. In addition, if firms want to boost R&D search in response to more inconsistent feedback, our research advises hiring CEOs with degrees from prestigious universities or CEOs who sit on multiple boards since they invested 47.2% more upon higher feedback inconsistency. Alternatively, BODs could support less prestigious CEOs to ensure they will be more responsive to inconsistencies in feedback. Lastly, CEOs who lack expertise in sales and marketing could be an alarm bell for firms for which high levels of R&D search are essential. In such cases, other TMT members and directors could provide assistance to such CEOs so as to prevent insufficient resources being allocated to R&D search when forward- and backward-looking performance signals are inconsistent.

Limitations and Directions for Future Research

Our study is not without its limitations, which though could provide fruitful directions for future research. First, a logical assumption which we did not draw on in our paper, is that multiple sources of power over the same stakeholder may coexist (Chatterjee & Pollock, 2017). Thus, future research could investigate how specific sources of power between the same coalition members combine to affect decision making. Second, we found expert power to have a negative effect on the CEO's propensity to problem-solve when dealing with inconsistent feedback, yet most studies have looked at the benefits of such a persuasive type of power for decision making (Peiró & Meliá, 2003). Thus it is important to determine which sources of soft power between different parties have a negative impact on decision making, and under what circumstances. Third, we did not consider that the four sources of CEO power might work as substitutes or complements (Misangyi & Acharya, 2014), but we believe that using a configurational approach such as qualitative comparative case analysis could be very useful to advance the theory further. Lastly, our findings based on the two configurations of inconsistent feedback that CEO power shifts problem-solving but not self-enhancing tendencies when dealing with inconsistent feedback urges scholars to investigate how self-enhancing could be offset.

CONCLUSION

In this study, we unpack the various ways in which decision makers responded to inconsistent feedback by engaging in either problem-solving or self-enhancement tendencies. Focusing on four sources of CEO power, we explained how power dynamics between the CEO and important stakeholders impacted R&D search. We hope that our findings inspire more governance research on how stakeholders such as TMT members or BODs interact and influence each other when they are making decisions following inconsistent feedback.

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TABLE 1
Descriptive Statistics and Correlations

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.R&D search	0.05	0.09	1.00																
2.Negative feedback	0.02	0.04	0.19	1.00															
3.Positive feedback	0.02	0.04	0.16	-0.21	1.00														
4.Negative prospects	0.00	0.01	0.02	0.02	0.03	1.00													
5.Positive prospects	0.04	0.04	0.26	0.08	0.05	-0.40	1.00												
6.CEO structural power	0.91	§2	-0.01	-0.01	-0.03	-0.07	-0.01	1.00											
7.CEO ownership power	0.04	0.83	0.04	-0.01	-0.03	0.02	0.06	-0.05	1.00										
8.CEO expert power	0.22	2.35	-0.06	0.01	-0.01	0.00	-0.01	-0.02	-0.02	1.00									
9.CEO prestige power	0.58	1.62	0.07	0.00	0.02	0.01	0.00	0.18	0.07	0.08	1.00								
10.Firm size	8.99	1.21	-0.09	0.01	-0.06	-0.14	-0.06	0.22	0.05	0.23	0.16	1.00							
11.Firm growth	0.37	0.57	0.14	-0.02	0.10	0.06	0.02	-0.08	0.02	-0.13	0.01	-0.05	1.00						
12.Financial slack	-0.44	0.32	0.47	0.07	0.13	-0.08	0.35	-0.07	0.07	-0.06	-0.03	-0.29	0.20	1.00					
13.Firm DPS	0.63	0.68	-0.21	-0.08	-0.08	-0.09	0.01	0.18	-0.09	0.28	0.10	0.44	-0.22	-0.23	1.00				
14.Firm share repurchases	4.57	2.81	0.05	-0.14	-0.04	-0.27	0.28	0.10	0.04	0.09	0.07	0.37	-0.07	-0.01	0.20	1.00			
15.Firm earnings management	0.01	0.07	-0.14	-0.08	-0.07	-0.02	-0.05	0.01	-0.04	0.00	0.00	-0.07	-0.03	-0.02	0.07	-0.01	1.00		
16.Firm stakeholder reputation	0.42	4.62	0.24	0.05	-0.02	-0.09	0.13	0.11	-0.03	0.14	0.05	0.04	-0.10	0.11	0.11	0.18	-0.03	1.00	
17.Firm status	0.15	0.47	0.24	0.16	-0.02	0.05	0.07	-0.06	0.07	-0.06	-0.02	0.05	0.16	0.18	-0.20	-0.04	-0.22	0.06	1.00
18.CEO age	55.63	6.12	-0.11	-0.02	-0.02	-0.02	-0.02	0.04	0.09	0.02	0.19	0.14	-0.03	-0.09	0.14	0.03	0.02	-0.03	-0.05
19.CEO gender	0.01	0.11	0.00	-0.03	0.00	-0.03	0.04	0.02	-0.02	-0.01	0.01	0.03	0.04	0.01	0.00	0.07	0.00	0.05	-0.01
20.CEO overconfidence	0.46	0.50	0.01	0.01	-0.03	0.05	0.06	0.03	0.07	-0.09	0.07	-0.18	0.17	0.15	-0.19	-0.07	-0.05	-0.12	0.12
21.CEO long-term pay mix	0.76	0.20	0.08	0.05	0.00	-0.18	0.11	0.28	-0.04	0.06	0.13	0.19	-0.08	0.01	0.16	0.18	-0.01	0.15	0.00
22.Board size	2.26	0.23	-0.11	-0.04	-0.05	-0.11	-0.04	0.03	-0.02	0.18	0.08	0.48	-0.08	-0.28	0.32	0.24	0.01	0.05	-0.10
23.Board independence	91.46	8.10	0.00	-0.03	0.02	-0.03	-0.01	0.28	-0.16	0.03	0.04	0.20	-0.02	-0.15	0.17	0.08	-0.02	0.06	-0.08
24.Industry R&D search	0.04	0.07	0.74	0.16	0.14	-0.08	0.31	-0.02	0.08	-0.11	0.03	-0.04	0.11	0.47	-0.25	0.12	-0.14	0.28	0.22
25.Managerial discretion	-0.09	1.89	0.28	0.00	-0.01	-0.07	0.15	-0.05	0.08	0.01	0.05	0.04	0.08	0.13	-0.01	0.20	0.08	0.20	-0.03
26.Environmental uncertainty	0.02	0.02	-0.05	0.13	0.09	0.04	-0.09	0.02	-0.07	-0.03	-0.05	-0.05	0.01	0.06	0.00	-0.20	-0.07	-0.06	0.03

TABLE 1
(continued)

	18	19	20	21	22	23	24	25
19.CEO gender	-0.01	1.00						
20.CEO overconfidence	0.22	-0.01	1.00					
21.CEO long-term pay mix	0.03	0.02	0.00	1.00				
22.Board size	0.07	0.00	-0.24	0.11	1.00			
23.Board independence	0.04	0.04	-0.09	0.14	-0.01	1.00		
24.Industry R&D search	-0.16	-0.05	0.02	0.06	-0.13	-0.03	1.00	
25.Managerial discretion	-0.13	0.03	-0.11	0.04	0.05	-0.09	0.31	1.00
26.Environmental uncertainty	0.09	-0.03	0.07	-0.02	-0.10	-0.06	-0.04	-0.33

Note: N = 1887. All correlations greater than |0.03| are significant at 5% level

TABLE 2
Arellano-Bond Dynamic Panel Regression Results Predicting R&D Search

Variables		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Negative prospects X Positive feedback X CEO structural power	H1		-23.296 *				-10.308
			(10.625)				(10.879)
Positive feedback X CEO structural power			-0.160				-0.105
			(0.104)				(0.092)
Negative prospects X CEO structural power			-0.212 **				-0.103
			(0.080)				(0.064)
Negative prospects X Positive feedback X CEO ownership power	H2			-56.875 *			-30.032
				(28.211)			(25.058)
Positive feedback X CEO ownership power				-0.592 **			-0.418 †
				(0.216)			(0.222)
Negative prospects X CEO ownership power				0.218			0.433
				(1.137)			(1.210)
Negative prospects X Positive feedback X CEO expert power	H3				-15.287 *		-10.265 *
					(5.984)		(4.559)
Positive feedback X CEO expert power					-0.124 †		-0.092 *
					(0.069)		(0.046)
Negative prospects X CEO expert power					-0.016		-0.155
					(0.162)		(0.184)
Negative prospects X Positive feedback X CEO prestige power	H4					45.862 **	37.627 **
						(16.036)	(13.371)
Positive feedback X CEO prestige power						0.489 **	0.408 **
						(0.162)	(0.133)
Negative prospects X CEO prestige power						0.339	0.243
						(0.346)	(0.281)
Negative prospects X Positive feedback		66.950 **	57.272 **	58.060 **	42.237 *	56.704 ***	34.639 **
		(23.934)	(21.726)	(20.171)	(18.125)	(16.121)	(11.895)
CEO structural power		-0.003 **	-0.004 †	-0.003 *	-0.003 *	-0.002 *	-0.003 *
		(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
CEO ownership power		-0.001	-0.001	-0.002	-0.001	-0.003	-0.002
		(0.003)	(0.003)	(0.009)	(0.003)	(0.003)	(0.009)
CEO expert power		0.000	0.002	0.000	0.001	0.000	-0.001
		(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)
CEO prestige power		0.007	0.006	0.004	0.003	0.009 †	0.003
		(0.005)	(0.005)	(0.005)	(0.003)	(0.005)	(0.004)

TABLE 2
(continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Negative feedback X Positive prospects X CEO structural power		0.470				0.152
		(1.251)				(0.952)
Positive prospects X CEO structural power		-0.221 **				-0.171 **
		(0.073)				(0.061)
Negative feedback X CEO structural power		0.004				-0.025
		(0.062)				(0.034)
Negative feedback X Positive prospects X CEO ownership power			1.466			0.590
			(1.599)			(1.299)
Positive prospects X CEO ownership power			-0.022			0.024
			(0.043)			(0.039)
Negative feedback X CEO ownership power			-0.093			-0.043
			(0.166)			(0.132)
Negative feedback X Positive prospects X CEO expert power				-0.256		0.148
				(0.541)		(0.439)
Positive prospects X CEO expert power				0.132 **		0.086 *
				(0.046)		(0.039)
Negative feedback X CEO expert power				0.012		-0.032
				(0.048)		(0.032)
Negative feedback X Positive prospects X CEO prestige power					1.428	0.755
					(2.568)	(2.609)
Positive prospects X CEO prestige power					-0.016	-0.039
					(0.061)	(0.046)
Negative feedback X CEO prestige power					0.095	0.094
					(0.095)	(0.073)
Negative feedback X Positive prospects	-6.487 *	-4.939 †	-5.814 *	-4.691 †	-5.622 *	-3.433
	(2.961)	(2.702)	(2.789)	(2.818)	(2.454)	(2.275)
Negative feedback	-0.051	-0.092	-0.052	-0.095	-0.063	-0.032
	(0.173)	(0.146)	(0.148)	(0.140)	(0.142)	(0.100)
Positive feedback	0.278	0.132	0.207	0.033	0.204	0.007
	(0.256)	(0.201)	(0.209)	(0.191)	(0.175)	(0.122)
Negative prospects	3.069 **	2.600 **	2.281 **	2.599 **	2.277 *	1.350 *
	(0.995)	(0.871)	(0.738)	(0.922)	(0.920)	(0.580)
Positive prospects	-0.493 **	-0.587 ***	-0.518 **	-0.518 **	-0.479 **	-0.542 ***
	(0.159)	(0.161)	(0.150)	(0.157)	(0.141)	(0.148)

TABLE 2
(continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
R&D intensity *t-1*	0.199 †	0.159	0.194	0.138	0.175	0.066
	(0.116)	(0.128)	(0.124)	(0.137)	(0.110)	(0.130)
Missing R&D dummy	0.099 †	0.051	0.051	0.072	0.086 *	0.016
	(0.057)	(0.044)	(0.039)	(0.046)	(0.043)	(0.020)
Firm size	0.031	0.022	0.024	0.030	0.001	-0.002
	(0.033)	(0.032)	(0.031)	(0.031)	(0.026)	(0.020)
Firm growth	-0.014	-0.006	-0.012	-0.010	-0.008	-0.004
	(0.016)	(0.014)	(0.015)	(0.013)	(0.010)	(0.007)
Financial slack	0.101 *	0.117 *	0.100 *	0.086 *	0.082 *	0.081 **
	(0.051)	(0.048)	(0.044)	(0.040)	(0.039)	(0.031)
Firm DPS	0.010	-0.004	0.007	-0.003	0.005	-0.002
	(0.012)	(0.009)	(0.009)	(0.010)	(0.010)	(0.007)
Firm share repurchases	-0.001	-0.001	0.000	0.000	-0.001	0.001
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)
Firm earnings management	0.005	0.016	-0.004	0.016	0.017	0.005
	(0.071)	(0.067)	(0.059)	(0.073)	(0.074)	(0.060)
Firm stakeholder reputation	0.000	-0.001	0.000	0.000	0.000	-0.001 †
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Firm status	0.007	0.007	0.009	0.004	-0.006	-0.001
	(0.008)	(0.007)	(0.007)	(0.008)	(0.006)	(0.005)
CEO age	0.000	0.000	-0.001	0.000	0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CEO gender	0.001	0.011	-0.003	0.038	-0.021	-0.003
	(0.041)	(0.047)	(0.031)	(0.046)	(0.038)	(0.031)
CEO overconfidence	0.002	0.007	0.007	0.007	0.001	0.012
	(0.012)	(0.011)	(0.011)	(0.010)	(0.010)	(0.008)
CEO long-term pay mix	0.045	0.035	0.025	0.011	0.013	0.006
	(0.032)	(0.026)	(0.024)	(0.020)	(0.018)	(0.013)
Board size	0.055	0.060 †	0.061 *	0.054	0.054 †	0.045 *
	(0.038)	(0.032)	(0.029)	(0.034)	(0.029)	(0.019)
Board independence	0.000	0.001	0.000	0.001	0.000	0.000
	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Industry R&D search	1.363 ***	1.293 ***	1.180 **	1.060 **	1.017 **	0.623 *
	(0.383)	(0.366)	(0.354)	(0.340)	(0.330)	(0.249)

TABLE 2
(continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Managerial discretion	0.003	0.003	0.002	0.002	0.004	0.003
	(0.006)	(0.005)	(0.005)	(0.004)	(0.005)	(0.004)
Environmental uncertainty	0.268	0.118	0.238	0.166	0.289	0.005
	(0.230)	(0.211)	(0.207)	(0.218)	(0.208)	(0.170)
Intercept	-0.450	-0.343	-0.346	-0.442	-0.171	-0.075
	(0.334)	(0.319)	(0.304)	(0.316)	(0.223)	(0.199)
Time fixed effects	YES	YES	YES	YES	YES	YES
Firm fixed effects	YES	YES	YES	YES	YES	YES
Wald X	84.54**	89.01**	114.23**	134.42***	200.34***	569.89***
Arellano-Bond test for AR(2)	-0.71	-0.91	-0.86	-0.81	-0.70	-1.12
Hansen J test	168.62	139.58	149.06	172.34	149.27	153.78

N = 1887 firm-year observations. Robust standard errors in parentheses. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

FIGURE 1

The Moderating Effect of CEO Power on the Relationship between Inconsistent Feedback and R&D Search

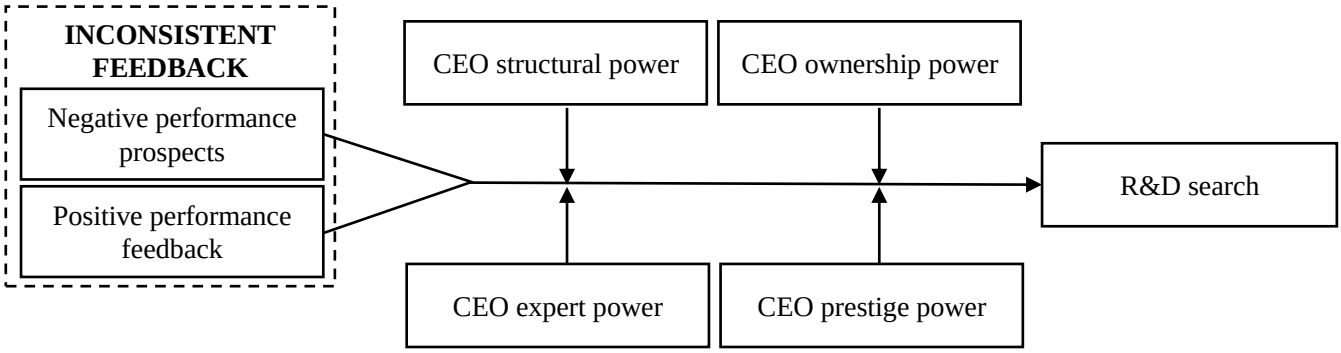


FIGURE 2

Three-Way Interaction: Negative Prospects x Positive Feedback x CEO Structural Power on R&D Search

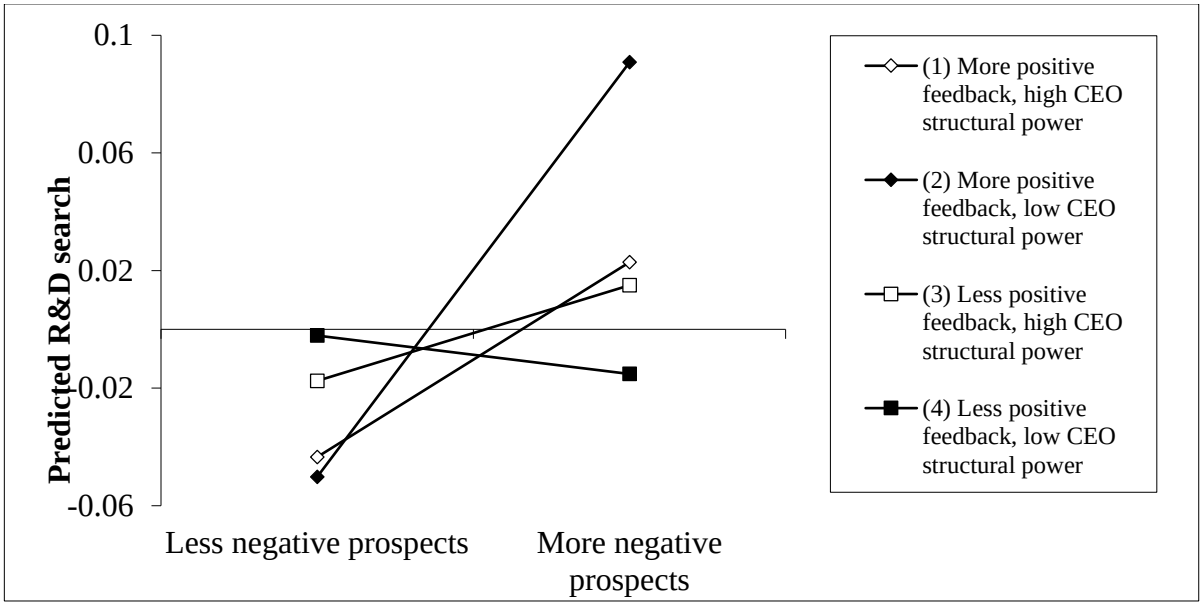


FIGURE 3

Three-Way Interaction: Negative Prospects x Positive Feedback x CEO Ownership Power on R&D Search

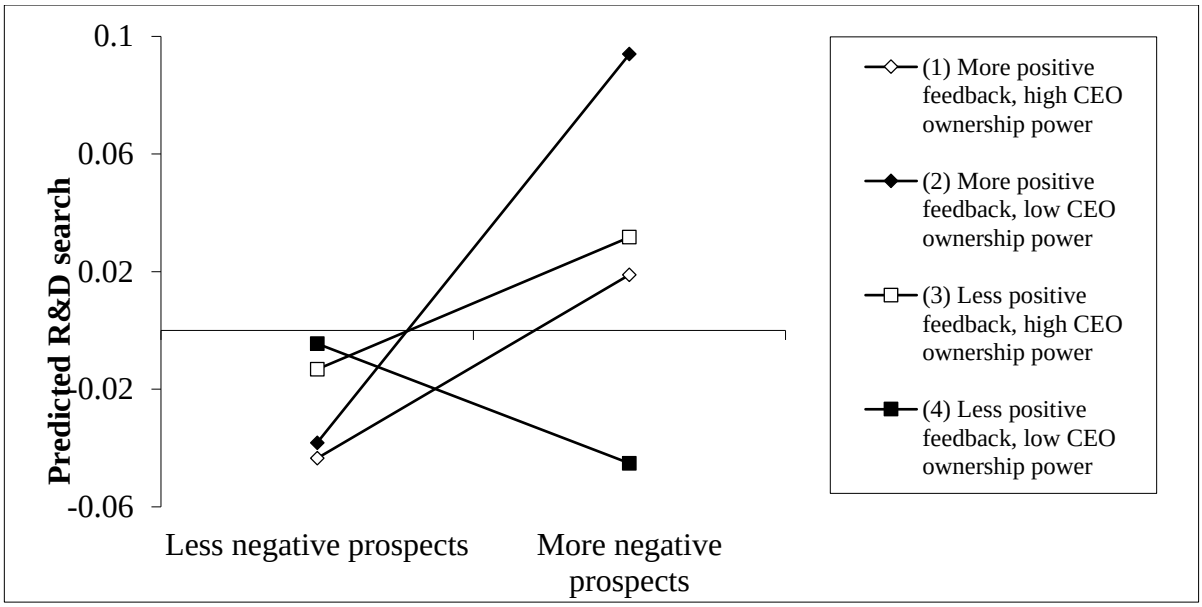


FIGURE 4

Three-Way Interaction: Negative Prospects x Positive Feedback x CEO Expert Power on R&D Search

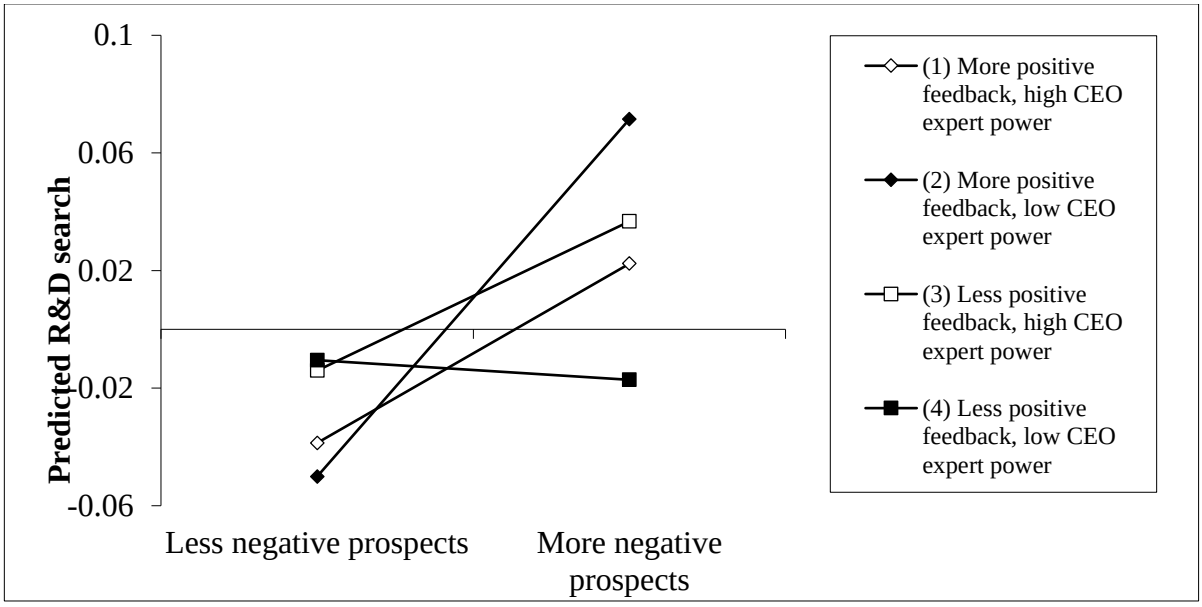
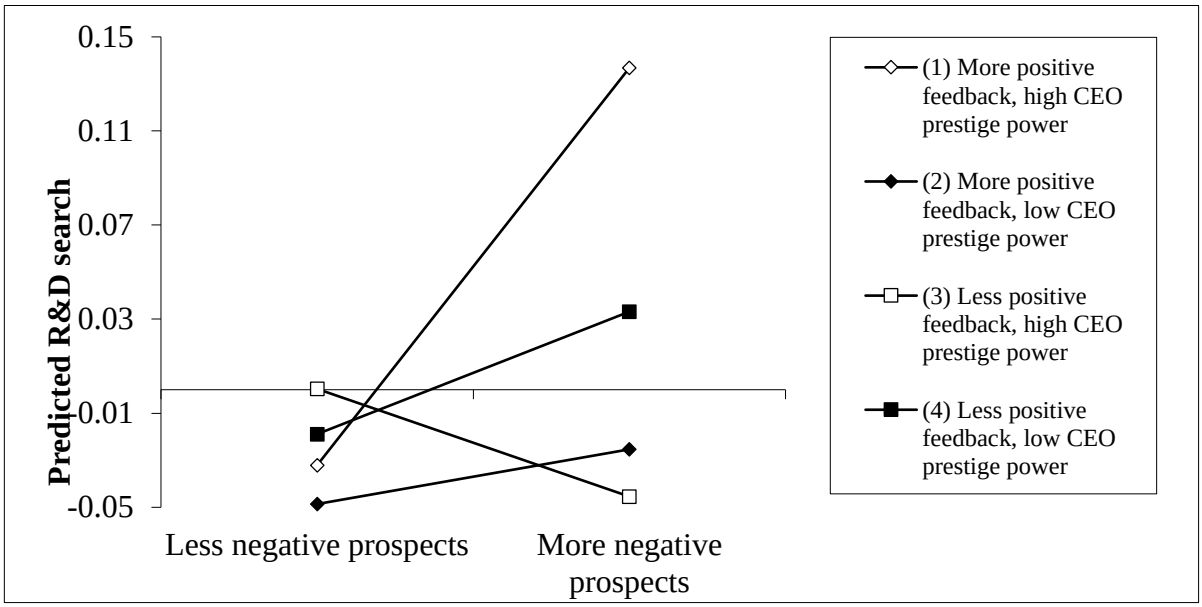


FIGURE 5

Three-Way Interaction: Negative Prospects x Positive Feedback x CEO Prestige Power on R&D Search



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