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The Power of One to Make a Difference: How Informal and Formal CEO Power Affect Environmental Sustainability

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Abstract We theoretically discuss and empirically show how CEO power based on environmental expertise and formal influence over executives and directors, in the absence and presence of shareholder activism, spurs firms toward greener strategies. Our results support the idea that CEOs with informal power, grounded in expertise, reduce corporate environmental impact and this relationship is amplified when the CEO also enjoys formal power over the board of directors. Additionally, we found that any source of CEO power, whether informal or formal, is a good catalyst for transforming shareholder activism into corporate greening. However, in the absence of such activism, only CEOs' informal environmental expert power acts as a determinant of firm environmental performance.

Keywords CEO power · CEO influence · Environmental performance · Behavioral strategy · Sustainability

Introduction

Recently, environmental management scholars have devoted significant effort to understanding why companies facing similar pressures exhibit heterogeneous responses. This line of work suggests that diverse environmental actions are not only a function of industry characteristics such as 'field cohesion' (Bansal and Roth 2000), self-regulation (King and Lenox 2000), and pollution intensity (Berrone and Gomez-Mejia 2009), but also depend on organizational aspects such as functional departments (Delmas and Toffel 2008), R&D orientation (Berrone et al. 2013), stakeholder engagement (Bowen et al. 2010; Herremans et al. 2015), and governance structures (Walls et al. 2012).

Less well understood from this line of inquiry is the role of top executives, although the ethics literature has made some advances in this regard. For instance, Rego et al. (2015) established that leadership characteristics are the most important determinants of corporate sustainability. Similarly, Wu et al. (2015) explored the role of corporate culture to explain the link between CEO ethical leadership and corporate social responsibility (CSR). In general, ethics researchers agree that corporate responsibility must be actuated by top executives whose orientations toward such issues play a central role (Fabrizi et al. 2014).

Notwithstanding these fruitful findings, the role of CEOs in corporate social action remains understudied compared to other organizational factors. Echoing this sentiment, (Siegel 2014: 221) lamented not long ago that even though top-level managers are in a position to shape and influence environmental policies, "most research on social responsibility has ignored the role of corporate leaders (e.g., CEOs) in formulating and implementing (socially responsible) initiatives." In particular, an important factor that has been overlooked at the top managerial level is *power*. Power is a meaningful area of investigation because it gives a CEO the freedom to scan the institutional environment to determine which actors are more salient (Mitchell et al. 1997) and which pressures to prioritize (Clarkson 1995). Moreover, power is an instrumental tool

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that allows CEOs to mobilize resources to direct strategic action (Daily and Johnson 1997; Hambrick and Finkelstein 1987; Norburn 1989). Given that all three aspects—scanning, resource allocation, and influence—are vital to direct environmental strategy (Chin et al. 2013), the role of CEO power deserves greater scholarly attention.

In this paper, we build on the notions of power to understand when and why CEOs use their discretion to lower the impact of their company's activities on the natural environment. To shape our argument, we draw on social theories of power that describe individuals' ability to influence the behavior of others. Specifically, we propose that CEOs have a greater ability to influence their company's environmental practices when they (a) have experience in addressing environmental matters and (b) leverage their formal influence over the board of directors (BOD) and the top management team (TMT). In addition, we argue that in the face of shareholder activism for corporate greening, CEOs will use any source of power to improve environmental performance. We test our prediction on an unbalanced panel of 267 firms over a seven-year period for 1320 firm-year observations. Overall, our results support our arguments.

This work attempts to make several contributions. First, it adds to corporate environmental, social, and ethical responsibility research by focusing on the role of CEO power in transforming demands into concrete actions. Our work thus shows that corporate leaders can, through power, influence corporate outcomes above and beyond organizational and industry factors. Our work thus contributes to a budding literature on the relevance of managerial characteristics in shaping corporate environmental and social action (Cordano and Frieze 2000; Lewis et al. 2014; Manner 2010; Sharma 2000; Waldman and Siegel 2008). Second, this study enriches the ethics literature by emphasizing the 'bright side' of power. Many studies have focused on the negative consequences of power such as CEO influence on corporate giving for their own personal interest (Werbel and Carter 2002) and the hierarchical abuse of power with unethical consequences (Vredenburgh and Brender 1998). We take a different approach that shows how CEO power can be used to steer the company on the right path. Third, our work contributes to scholarly work that weds institutional and behavioral perspectives. Specifically, by analyzing how CEO power can convert external pressures to improve environmental performance into action, we help bridge the current macro–micro divide in the field (Hirsch and Lounsbury 1997; Siegel 2014). Finally, we add to the literature on CEO power by showing how different sources of power interact and reinforce one another in affecting firm outcomes. In short, we demonstrate that one person really can make a difference.

Theoretical Development

Understanding what drives environmental strategy and subsequent environmental performance is not a simple task. Etzion (2007) identified firm-, industry-, and society-level attributes that are associated with environmental performance. Institutional approaches to environmental strategy purport that external constituents pressuring firms to address environmental issues (Delmas and Toffel 2008; Hoffman 2001) derive from coercive, regulatory, and normative sources, as well as from stakeholder demands (Delmas 2002; Henriques and Sadorsky 1999). Although this perspective might be expected to show that firms' environmental responses are similar if they face similar pressures (Reid and Toffel 2009), evidence suggests that firms' environmental responses can differ substantially (Berrone et al. 2013; Walls and Hoffman 2013). For example, firms in the same industry, subject to the same regulatory regime, behave very differently with regard to investments in pollution prevention and control equipment (Berrone et al. 2010; Berrone and Gomez-Mejia 2009). In reality, firms have ample strategic room to maneuver when responding to institutional pressures (Oliver 1991), and with respect to environmental strategy, firm responses range from the symbolic to the substantive (Marquis and Toffel 2011) and may even deviate positively from norms in the institutional field (Walls and Hoffman 2013). However, exactly why different organizational responses occur in the context of shared institutional pressures has been more difficult to establish (Berrone et al. 2013; Delmas and Toffel 2008).

Part of the answer is thought to lie in executives' interpretation of external pressures and subsequent strategic choice. CEOs, in particular, play a critical role in firms' environmental responses. As the most influential member of the organization (Daily and Johnson 1997; Hambrick and Finkelstein 1987; Norburn 1989), a CEO's decision can be sufficiently influential to go against the grain of industry peers, shareholders, and the board (Haynes and Hillman 2010; Westphal and Zajac 1995; Zajac and Westphal 1996b). CEOs are especially likely to pursue a given strategy if they have a personal understanding and stake in the issue at hand and if they have the know-how to address it. For instance, leaders in the environmental sector are masters at both inspiring others to follow their lead and ensuring that their vision is achieved because of their intimate understanding of environmental matters and their value orientations (Egri and Herman 2000; Hemingway 2005). Thus, while firms may face similar pressure to engage in corporate greening, leaders' dispositions and discretion determine how companies respond. This ability largely arises from social sources of power that CEOs possess.

Sources of CEO Power

Power is a tool that can be used to influence others to do (or believe) something that they otherwise would not (Dahl 1957; House 1988). For CEOs, power comes with the job (Daily and Johnson 1997; Norburn 1989), bestowing them the capacity to implement decisions based on their individual preferences (Brockmann et al. 2004; Finkelstein and Hambrick 1990; Haynes and Hillman 2010).

In the broader strategy research, power is typically construed according to Finkelstein's (1992) seminal article on top management team power that describes structural, ownership, expert, and prestige power. However, extending these group-level concepts to the individual CEO has been problematic (Daily and Johnson 1997), and most researchers have relied on simpler proxies or indices of CEO power such as tenure, board duality, and share ownership. Even so, empirical results have been inconsistent. For example, powerful CEOs can moderate the extent to which boards effect strategic change (Haynes and Hillman 2010). But, in the context of bankruptcies, CEO power acts as a double-edged sword, increasing the odds of firm survival while lengthening the time required for firms to reorganize (Brockmann et al. 2004). While some sources of CEO power can improve a firm's survival rate after initial public offering, other sources of CEO power are detrimental (Bach and Smith 2007). Further, Dowell et al. (2011) found a moderating, rather than direct, effect of CEO power on firm survival during times of financial distress. The CSR literature has found that powerful CEOs induce greater transparency and implementation of CSR, but it is unclear whether this is driven by agency factors or personal incentives (Fabrizi et al. 2014; Jizi et al. 2014). These seemingly inconsistent results suggest that there is a need to look at CEO power via a different theoretical lens.

Here, we draw on *social perspectives* of power that offer deeper insights into the relative nature of power and the various social sources individuals can use. French and Raven (1959) contended that individual power results from five social sources: legitimate power, reward power, coercive power, expert power, and referent power. These bases of power were later streamlined into two major classifications: *formal* and *informal* social channels (Peiró and Meliá 2003) that represent two dimensions of the same construct but with different theoretical underpinnings (Greve and Mitsuhashi 2007). This literature suggests that either source of power may suffice for CEOs to direct strategic activity. However, the relationship between CEO power and strategic action is nuanced because most environmental strategies are complex, layered, and have unpredictable implications (Roome 1992). We therefore hypothesize different relationships of informal and formal power for environmental performance.

CEOs' Informal Power and Corporate Environmental Performance

A CEO's informal power results from her or his personal characteristics and "influence over personnel based solely upon the manager's superior knowledge, expertise, and proven ability to perform" (Peiró and Meliá 2003; Singh 2009: 168). This type of power arises in CEOs because experience functions as a key cognitive filtering mechanism for how decision makers process contextual information (Hambrick 2007; Starbuck and Milliken 1988; Walsh 1988). Such CEOs can gain cooperation from others as they understand the issues at hand, know the relevant processes involved, and are able to reduce the complexity and ambiguity associated with the issue (Lines 2007). Experts are able to detect patterns, notice events, draw on past events to predict what is likely to happen in the future, and detect the absence of cues that allow them to take advantage of an unexpected opportunity (Klein 1998). By contrast, without expertise, CEOs' ability to solve problems and to consider alternative approaches is diminished (Ocasio 1997). Thus, CEOs with informal power can engage in sense-giving behavior that makes their knowledge visible to others which incites participation (Lines 2007).

In general, experience with environmental issues is an important antecedent of individual environmental behavior (e.g., Dietz et al. 1998). It is experience that links environmental values to action (Hines et al. 1987). Within firms, environmental experience and values shape organizational behavior and managerially driven initiatives (Bansal and Roth 2000; Cordano and Frieze 2000; Delmas and Toffel 2008; Sharma 2000). Managers use their environmental experience to foster organizational strategic changes (Hoffman 2003; Howard-Grenville and Hoffman 2003). Moreover, experience with environmental issues allows CEOs to more easily perceive the potential benefits of engaging in environmental strategies that can lower organizational inputs and waste costs and generate new revenue streams (Porter and van der Linde 1995; Russo and Fouts 1997). Accordingly, we expect CEOs with relevant environmental expertise to use this expertise as a source of informal power to influence their company's environmental outcomes.

H1 CEOs' informal environmental expert power is negatively associated with corporate environmental impact

The Moderating Effect of CEOs' Formal Power

A CEO's formal power is based on her or his ability to reward or coerce others by way of formal position, charter, and hierarchy in the organization (French and Raven 1959; Singh 2009). It is through formal power that CEOs can control the flow and distribution of specific resources in a

top-down manner (Peiró and Meliá 2003), punish and reward employees regarding implementation, and elicit compliance through behavioral social norms (Lines 2007). Such power becomes a social norm within firms whereby employees acknowledge the superiority of the CEO's office, giving the CEO the right to prescribe behavior (French and Raven 1959) and direct organizational action (Daily and Johnson 1997; Norburn 1989).

Although formal power is automatically bestowed to CEOs by the nature of their jobs, the amount of formal social influence that CEOs have can vary. Such variance arises because CEOs are answerable to the board and other top managers. For example, while CEOs have been found to be the most dominant members of the TMT, no CEO has full power over the executive suite (Smith et al. 2006). Power is, after all, *relative* since the source of power rests on the relationship between any two individuals (French and Raven 1959). Accordingly, the level of formal power that a CEO has within the organization depends on his or her relative influence over the TMT and the BOD. Prior studies confirm this notion. For instance, Smith et al. (2006) argued that TMTs with unequal power distributions allow a few key members to direct critical resources and guide other members. Similarly, Greve and Mitsuhashi (2007) argued that a concentration of power among the TMT increases the likelihood of strategic change in firms because a powerful manager has the ability to develop norms within organizations that reflect his/her own preferences.

Thus, if a CEO is powerful relative to the TMT, she or he is better able to direct the organization toward specific goals. In the case of environmental performance, and in the presence of a CEO's informal 'environmental expert' power, formal power over the TMT will allow the CEO to drive the organization to lower its environmental footprint more effectively than through informal power alone. Therefore, we propose the following hypothesis:

H2 CEOs' formal power over the TMT negatively moderates the association between CEOs' informal environmental expert power and corporate environmental impact

Similarly, prior research has shown that the power of a CEO is relative to that of the BOD. In some firms, the BOD is the sole means to check the behavior of CEOs that are already powerful with respect to the TMT (Combs et al. 2007). Even so, boards cannot fully control CEOs because CEOs can manipulate board membership and influence strategies through relationships with other board members. For instance, CEOs with substantial power over the board have higher salaries than CEOs who are less powerful (Boyd 1994). Powerful CEOs also tend to appoint board members who are demographically similar to themselves in order to influence outcomes of board-based decisions (Westphal and Zajac 1995).

These previous findings suggest that when a CEO has substantial formal power relative to the BOD, the CEO is more likely to get his or her own 'way.' We purport that this argument also holds for environmental strategies. Because environmental initiatives have unclear financial benefits (Bansal 2005; Margolis and Walsh 2003), BODs may not sanction such strategies in the interest of protecting more short-term shareholder demands. By contrast, powerful CEOs face less pressure to achieve immediate results, allowing them to aim for long-term environmentally and/or socially orientated goals (Cespa and Cestone 2007; Surroca and Tribo 2008). Such CEOs are thus better positioned to implement risky and ambiguous environmental initiatives (Berrone and Gomez-Mejia 2009). Therefore, powerful CEOs can demand greater resource allocation and more substantial changes in products and processes that have the potential to become financially beneficial to the firm in the long term (Berrone and Gomez-Mejia 2009). Hence:

H3 CEOs' formal power over the BOD negatively moderates the association between CEOs' informal environmental expert power and corporate environmental impact

CEO Power in the Context of External Pressure

In the absence of informal environmental expert power, there is no clear reason for CEOs with formal power to pursue environmental strategies unless firms face pressure to do so from the institutional environment. A plethora of prior research has established that firms are sensitive to such pressures (e.g., Delmas and Toffel 2008; Hoffman 2001) and that managers filter and interpret information from the institutional environment through cognitive processes in order to translate them into action (Daft and Weick 1984; Kiesler and Sproul 1982). We argue that CEO power plays an important role in converting pressures into meaningful action.

An important source of pressure that CEOs face, in terms of environmental, social issues, and ethical issues, is shareholder activism (Rehbein et al. 2013). Shareholders are highly salient stakeholders because they are legitimate and powerful, and the issues that they raise bear a level of urgency (Mitchell et al. 1997). Shareholders enjoy formal mechanisms through which they can exercise their voice to elicit formal responses from CEOs (Hoskisson et al. 2002), expressed through annual general meetings and via proxy voting, shareholder resolutions, and collective action (David et al. 2007; Reid and Toffel 2009). Shareholder activism is thus a powerful factor in driving corporate environmental and ethical action (Stevens et al. 2005).

While all CEOs are doubtless aware of shareholder pressure for greening, only powerful CEOs can respond

effectively by inspiring and aligning internal stakeholders to implement the necessary changes. They can do so either through informal or formal power. CEOs with informal power will be able to quickly understand what needs to be done; and, since shareholder pressure for greening also matches their own value systems, CEOs with informal power will be particularly likely to respond (Andersson and Bateman 2000). Moreover, acting on such pressure may enhance CEOs' personal reputation via 'green halos' that are valued by the financial market (Fanelli and Misangyi 2006). CEOs with formal power will exert their influence over the company via more coercive channels. Such CEOs may be more concerned with alleviating shareholder pressure than with gaining green halos, but the end result is the same: CEOs use their formal power to reduce the company's environmental footprint.

H4a CEO informal environmental expert power negatively moderates the association between shareholder activism and corporate environmental impact

H4b CEO formal power over the TMT negatively moderates the association between shareholder activism and corporate environmental impact

H4c CEO formal power over the BOD negatively moderates the association between shareholder activism and corporate environmental impact

Methodology

Our sample comprised U.S. listed firms in the so-called 'dirty' industries (SIC <5000), that have large environmental footprints such as extraction, construction, manufacturing, transportation, and utilities sectors (Hart and Ahuja 1996). Our sample focused on the Standard and Poor 500 index, from years 2001 to 2007. We used six databases to compile our sample: BoardEx, Execucomp, Compustat, Thomson Reuters, EthVest, and Trucost. We dropped observations if data were missing and dropped an additional 35 observations owing to a lack of variance in calculating power variables. Our final sample consisted of an unbalanced panel of 267 firms and 1320 firm-year observations, with an average panel of 4.9 years.

A Hausman specification test indicated that a fixed-effects model was appropriate for our panel data (Hausman et al. 1984). Fixed-effects models have the advantage over random-effects models of explicitly modeling features that are unobservable but stable over time and their possible correlation with explanatory variables. It is also considered more conservative than cross-sectional models because only changes in independent variables within a firm can produce significant effects.

Dependent Variable

We measured *Environmental impact* using data from Trucost (Delmas and Nairn-Birch 2011; Lewis et al. 2014; Thomas et al. 2007). Trucost collects data on >700 different environmental measures. Based on a proprietary input–output model that draws on >450 business sectors and activities, Trucost uses revenue and cost data to run a segmental analysis that identifies what firm activities are relevant to apportion resources and associated emissions. Emissions are calculated from actual impact data or, if such data are unavailable, estimated from fuel use. The impact figures are standardized and categorized according to acknowledged reporting standards. Trucost then invites companies to verify or refine the information, and any additional data that companies provide are validated by Trucost's analysts.

Our dependent variable was based on environmental activities *directly related* to a company's operations and *explicitly excluded* firms' supply chain and investment portfolio activities since CEOs may have limited say on such activities. Trucost's direct environmental impact score consists of an aggregated damage score (measured in U.S. dollars) based on seven key indicators: greenhouse gas emissions, other emissions, general waste, water abstraction, heavy metals, volatile organic compounds, and natural resource use. The damage score is standardized by firm revenue to account for the higher amount of goods production of firms with higher revenues. Thus, a higher *Environmental impact* score means a firm had more environmental damage (poorer performance) than a company with a lower impact score. We lagged all our independent variables by 1 year to allow some time for variables to take effect.

Independent Variables

The independent variables of interest included CEOs' informal environmental expert power, CEOs' formal power over the TMT and the BOD, and shareholder activism for corporate greening. All independent variables were centralized to minimize collinearity effects and to facilitate the interpretation of the interaction effects, except for shareholder activism which was a dummy variable (Aiken and West 1991). Traditionally, social sources of power have been measured using survey data. We adapted these methods by using archival measures because this allowed us to collect data for a large sample size over multiple years.

CEOs' Informal Environmental Expert Power

In the context of environmental management, expert power is the most relevant source of informal power that CEOs can possess. Expert power has been measured in terms of *content* and *process* of the area of expertise (Lines 2007).

Survey-based studies have measured expert power as: knowledge of the topic (content), technical competence (content), quality of the person's work and judgments (process), and extensive experience in managing a change (process) (Kudisch et al. 1995; Lines 2007; Peiró and Meliá 2003; Spekman 1979). In developing our archival measure of informal environmental expert power, we focused on both content and process experience in environmental matters. In terms of content-based environmental experience, we used (i) the extent of CEOs involvement in environmental activities at non-corporate institutions such as foundations, NGOs, government bodies, and local communities; and (ii) any honors or awards that CEOs received for their environmental actions. To capture process-based environmental experience, we used CEOs' previous occupations, directorships, and other corporate appointments (e.g., Carpenter and Westphal 2001) based on (i) their official environmental responsibilities in previous posts; and (ii) their prior membership in board sub-committees dedicated to attending to environmental matters.

The data on CEOs involvement in environmental activities, awards, job experience, and board committees were collected from BoardEx. To identify relevant awards/honors, activities, job experience, and board positions, we used keywords to search for titles and descriptions of these four categories. Keywords included 'environment,' 'ecology,' 'nature,' 'sustainable,' 'remediation,' 'renewable,' 'pollution,' and 'energy' and similar. Coded material was checked and misrepresentative items were eliminated. We then created a dummy variable for each category to indicate whether a CEO had experience in one or more of these four categories. The dummies were aggregated to obtain an overall score of the breadth of CEOs' informal environmental expert power (ranging from 0 to 4), and centralized.

CEOs' Formal Power Over the TMT

Research on social sources of formal power emphasizes reward, coercive, and legitimate power. Survey-based studies have measured formal power as formal authority based on hierarchical position in the company, ability to exercise power in a top-down manner, ability to control and mobilize resources, ability to influence others based on a person's role within the company, and ability to reward and punish others via promotion, privileges, and money (Lines 2007; Peiró and Meliá 2003; Spekman 1979).

We drew on a vast body of prior work in the strategy literature to establish a measure of CEOs' ability to influence TMT members in the form of CEO tenure, company tenure, and the proportion of the TMT appointed by the CEO. These variables were calculated using BoardEx data. We measured CEO tenure as the number of years he/she had been the CEO, which reflects legitimate power. Company tenure was measured as the number of years the CEO had worked at the company, which reflects ability to influence others in the company and to mobilize resources. The proportion of TMT members appointed by the CEO was calculated as the number of top executives who began their role at the company after the CEO began in the company, divided by the total number of TMT members (Zajac and Westphal 1996a) using the top two tiers of the organization as part of the TMT (i.e., CEO, COO, CFO) and the next level of management above the VP level (Carpenter 2002). Executives who are appointed by the CEO are likely rewarded (and punished) according to the CEO's preferences and likely to perceive that the CEO can exert pressure on them. The final formal power over the TMT variable was created by standardizing each component by industry and year, then aggregated (Finkelstein 1992) and centralized.

CEOs' Formal Power Over the BOD

CEOs' formal power over the board was constructed on the same theoretical premises as CEOs' formal power over the TMT but with respect to CEOs' influence over the board through their legitimate, reward, and coercive power. For legitimate power, we calculated a dummy for CEO duality, when the CEO was also Chairman of the Board. Past research has shown that CEO duality is an indicator of formal authority that CEOs have over the board that allows them to exert greater influence over the board (Zajac and Westphal 1996b). We also added a dummy to indicate whether the CEO was the company founder or a relative of the founding family because such CEOs tend to own a large proportion of their company's shares (e.g., Anderson and Reeb 2003) and therefore have substantial influence over the BOD. We next calculated the number of years that the CEO had served on the board because board tenure is an indicator of board members' ability to mobilize resources and influence others. These variables were standardized by industry and year, aggregated, and then centralized.

Shareholder Activism for Corporate Greening

We measured shareholder pressure for corporate greening in the form of shareholder activism. Such activism typically takes the form of shareholder proposals submitted at annual general meeting proxy voting. We used the EthVest database (Interfaith Center for Corporate Responsibility) to identify when environmental proposals had been put forth by shareholders (Lewis et al. 2014; Reid and Toffel 2009). We created a dummy variable to indicate whether shareholder pressure for environmental action was evident in a particular year. This measure was not centralized since it was a dummy variable.

Control Variables

We added a series of standard time-variant control variables to account for firm-, CEO-, and governance-specific factors that could affect firms' environmental impact. We included *Firm performance* as return on assets, *Firm size* as the log of assets, *Sales growth* as a one-year change in sales, *Leverage* as debt over equity, *Capital intensity* as capital expenditure over sales, *R&D intensity* as R&D expenditure over sales, and *Advertising intensity* as advertising expenditure over sales (King and Lenox 2002; McWilliams and Siegel 2000). *Year dummies* were included based on the results of a Wald fixed-time effects test.

To account for CEO-specific factors, we included *CEO age* in number of years, *CEO newness* as a dummy variable for CEOs who had been in office for fewer than 3 years because this period is when most major strategic actions take place (Lewis et al. 2014), and *CEO salary* as cash income (Combs et al. 2007; Walls et al. 2012). We included *CEO shares held* as the percentage of shares held by the CEO to account for alignment incentives with shareholders and *CEO sector experience* as the number of years that the CEO had worked in the industry to control for more general expertise CEOs possessed. We also controlled for several board and shareholder variables: *Board independence* (outsider directors over total directors); a dedicated *Board CSR committee*, as a dummy variable; and *Shareholder concentration*, as the percentage of shares held by the top-five institutional investors (Walls et al. 2012).

We also added controls to account for the fact that TMT and BOD members may possess environmental expertise, in which case CEO informal environmental expert power might not be necessary. Using the exact same method as for CEO informal power, we identified the breadth of environmental expertise among individual TMT and BOD members. We then aggregated these dimensions at TMT and BOD levels, respectively, to gain an overall score of the *Level of TMT environmental expertise* and the *Level of BOD environmental expertise*.

Results

The mean *Environmental impact* of companies was 4.11, and 95 % of firms had an impact below 28.29, with the highest impact at 81.08 and the lowest at 0.01. All firms with high impacts were in the electric/gas/sanitary industry (two-digit SIC = 49). The best environmental performers included companies in the building/construction, printing/publishing, industrial machinery, electronics, and measuring instrument industries.

Twenty-two percent of CEOs had informal environmental expert power; these CEOs were evenly distributed across industries. CEO power over the TMT and BOD was likewise evenly distributed across industries. Approximately, 12.2 % of all firms in our sample faced pressure from shareholders. Four industries faced no shareholder activism: the apparel, fabricated metal products, railroad transport, and communication industries. Correlations (Table 1) did not raise any concerns, except between CEO power over the TMT and CEO power over the BOD. For this reason, we used these variables in separate regression models.

We ran two sets of fixed-effects regression models.[1] The first set of regressions (Table 2) tested Hypotheses 1 and 2. We first ran a model that included only the control variables (Model 1) adding the level of TMT environmental experience in Model 2, and introducing CEO informal and formal power in Model 3. The interaction effect was tested in Model 4. The second set of regressions tested Hypotheses 1 and 3 (Table 3). We first ran a model that included only the control variables (Model 1) adding the level of BOD environmental experience in Model 2, and introducing CEO informal and formal power in Model 3, and the interaction in Model 4.

These tables indicate that informal environmental expert power was consistently negatively associated with environmental impact in support of Hypothesis 1. No statistical support was found for formal TMT power as a moderator in this relationship (Hypothesis 2). We observed a significant interaction effect between formal BOD power and informal expert power for environmental impact in support of Hypothesis 3.

Hypotheses 4a–4c were tested in Table 4. Interestingly, none of the models showed a direct effect of shareholder activism on environmental impact (not hypothesized). However, Model 2 showed a significant and negative moderating effect of informal environmental expert power for shareholder activism and environmental impact, supporting Hypothesis 4a. Similarly, both formal TMT power (Model 4) and formal BOD power (Model 6) significantly interacted with shareholder activism for environmental impact in support of Hypotheses 4b and 4c.

We plotted all interaction effects to facilitate their interpretation and also conducted simple slopes test to check statistical significance of the slopes and between points (Aiken and West 1991). Figure 1a shows that higher informal expert power of the CEO was indeed associated with lower environmental impact but that the amount of

[1] We calculated two sets of R^2 for our regressions. The first was the "R^2 (within)" statistic reported in the Stata 13 program, using the -xtreg- command. For fixed-effects regressions, the 'within' statistic is normally the point of reference for variance explained. However, the -xtreg- command calculates the R^2 differently than other statistical programs, and for the purpose of comparability, we also used Stata's -areg, absorp- command which includes the fixed-effects dummies in the calculation of R^2.

Table 1 Correlations

		Mean	S.D.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Env'tal impact	4.11	10.85	0.01	81.08																
2	Firm performance	0.04	0.15	−2.91	0.45	−0.04															
3	Firm size	9.11	1.13	6.23	12.63	0.19	0.05														
4	Sales growth	0.24	2.23	−0.95	67.57	0.03	−0.01	0.07													
5	Leverage	0.89	4.20	−61.66	74.29	0.08	0.00	0.09	0.00												
6	Capital intensity	0.09	0.13	0.00	1.30	0.20	−0.04	0.14	0.03	0.01											
7	R&D intensity	0.07	0.18	0.00	4.04	−0.13	−0.32	−0.24	0.08	−0.03	−0.07										
8	Advertising intensity	0.01	0.03	0.00	0.28	−0.14	0.11	0.04	−0.02	−0.02	−0.12	−0.03									
9	CEO age	55.70	6.81	37.00	79.00	0.14	0.08	0.10	0.03	0.03	0.08	−0.11	−0.06								
10	CEO newness	0.34	0.47	0.00	1.00	0.04	−0.10	0.01	−0.03	0.04	−0.04	0.00	0.05	−0.25							
11	CEO salary	2.17	2.33	0.00	43.51	−0.06	0.11	0.24	0.01	0.01	0.13	−0.09	0.12	0.08	−0.05						
12	CEO shares	1.20	2.89	0.00	34.94	0.01	−0.07	−0.21	0.00	−0.03	0.00	0.04	0.14	−0.03	−0.16	−0.03					
13	CEO sector experience	13.52	9.61	0.00	69.80	−0.09	0.02	−0.13	0.00	0.01	0.08	0.05	0.05	0.17	−0.16	−0.04	0.14				
14	Board independence	0.85	0.07	0.40	1.00	0.12	0.08	0.18	0.01	0.03	−0.10	−0.10	−0.06	−0.01	0.03	−0.08	−0.12	−0.14			
15	CSR com'tee board	0.24	0.43	0.00	1.00	0.32	0.00	0.28	−0.01	0.10	0.03	−0.16	−0.06	0.08	0.08	0.03	−0.08	−0.05	0.14		
16	Shareholder conc.	0.25	0.08	0.00	0.61	−0.06	−0.02	−0.29	−0.05	−0.02	−0.03	0.02	−0.08	0.02	−0.06	−0.11	0.04	0.05	−0.02	0.03	
17	CEO informal exp power	0.00	0.44	−0.23	1.77	0.35	0.00	0.26	−0.01	0.00	0.10	−0.11	0.00	0.01	0.03	−0.03	0.07	−0.07	0.13	0.28	−0.08
18	TMT envt expertise	0.00	0.14	−0.02	1.98	0.01	0.02	0.08	−0.01	0.00	−0.02	−0.03	−0.04	−0.06	0.06	0.02	−0.03	−0.01	−0.03	0.08	0.03
19	BOD envt expertise	0.00	1.04	−1.70	2.30	0.21	0.07	0.46	0.02	0.01	0.08	−0.17	0.08	0.09	0.03	0.08	−0.08	−0.10	0.16	0.42	−0.13
20	Formal TMT power	0.00	2.10	−4.57	6.93	−0.02	0.05	−0.03	0.03	0.05	0.01	0.04	0.01	0.27	−0.54	0.02	0.16	0.41	−0.11	−0.01	0.02
21	Formal BOD power	0.00	1.76	−3.64	5.79	0.00	0.01	−0.06	0.04	0.05	0.05	0.05	−0.04	0.34	−0.56	0.05	0.25	0.32	−0.06	−0.05	0.03
22	Shareholder activism	0.12	0.33	0.00	1.00	0.18	0.07	0.30	0.01	−0.06	0.11	−0.09	0.10	0.03	−0.01	0.10	0.00	−0.06	0.03	0.16	−0.11

		17	18	19	20	21
17	CEO expert power					
18	TMT envt expertise	0.19				
19	BOD envt expertise	0.37	0.11			
20	Formal TMT power	−0.06	−0.04	0.01		
21	Formal BOD power	−0.01	−0.05	−0.05	0.77	
22	Shareholder activism	0.09	0.11	0.17	−0.01	−0.03

Table 2 Fixed-effects regression of CEO informal and formal power over TMT

	Model 1	Model 2	Model 3	Model 4
Firm performance	0.517	0.520	0.516	0.504
(SE)	(0.62)	(0.62)	(0.62)	(0.62)
Firm size	−0.451	−0.479	−0.533†	−0.545†
	(0.32)	(0.32)	(0.32)	(0.32)
Sales growth (1 year)	−0.057†	−0.057	−0.055	−0.054
	(0.03)	(0.03)	(0.03)	(0.03)
Leverage	0.003	0.003	−0.000	−0.001
	(0.02)	(0.02)	(0.02)	(0.02)
Capital intensity	1.702	1.672	1.608	1.581
	(1.52)	(1.52)	(1.52)	(1.52)
R&D intensity	−0.048	−0.062	−0.058	−0.058
	(0.60)	(0.60)	(0.60)	(0.60)
Advertising intensity	−8.102	−8.074	−8.070	−7.360
	(11.28)	(11.27)	(11.26)	(11.26)
Year dummies	Yes	Yes	Yes	Yes
CEO age	−0.002	−0.004	0.001	−0.001
	(0.02)	(0.02)	(0.02)	(0.02)
CEO newness	−0.146	−0.145	−0.154	−0.152
	(0.19)	(0.19)	(0.21)	(0.21)
CEO salary	−0.006	−0.005	−0.004	−0.005
	(0.04)	(0.04)	(0.04)	(0.04)
CEO shares held	−0.005	−0.005	−0.003	−0.007
	(0.05)	(0.05)	(0.05)	(0.05)
CEO sector experience	−0.016	−0.016	−0.014	−0.013
	(0.01)	(0.01)	(0.01)	(0.01)
Board independence	0.245	0.118	0.067	0.030
	(1.90)	(1.91)	(1.90)	(1.90)
Board CSR committee	−0.411	−0.409	−0.487	−0.480
	(0.63)	(0.63)	(0.63)	(0.63)
Shareholder concentration	−0.285	−0.312	−0.150	−0.284
	(1.59)	(1.59)	(1.59)	(1.60)
Level of TMT env'tal experience		−0.765	−0.240	−0.198
		(0.69)	(0.72)	(0.72)
CEO informal expert power			−0.907*	−1.022**
			(0.36)	(0.37)
CEO formal power over TMT			−0.026	−0.019
			(0.06)	(0.06)
CEO informal*formal power TMT				−0.141
				(0.10)
Constant	8.766*	9.238**	9.427**	9.631**
	(3.43)	(3.46)	(3.47)	(3.47)
R^2 (within)–xtreg	4.38 %	4.49 %	5.08 %	5.25 %
R^2 (adjusted)–areg	95.43 %	95.43 %	95.45 %	95.46 %

$n = 1320$; † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 3 Fixed-effects regression of CEO informal and formal power over BOD

	Model 1	Model 2	Model 3	Model 4
Firm performance	0.517	0.503	0.474	0.479
(SE)	(0.62)	(0.62)	(0.62)	(0.62)
Firm size	−0.451	−0.435	−0.493	−0.527†
	(0.32)	(0.32)	(0.32)	(0.32)
Sales growth (1 year)	−0.057†	−0.061†	−0.058†	−0.059†
	(0.03)	(0.03)	(0.03)	(0.03)
Leverage	0.003	0.002	−0.000	−0.003
	(0.02)	(0.02)	(0.02)	(0.02)
Capital intensity	1.702	1.470	1.236	1.107
	(1.52)	(1.53)	(1.53)	(1.53)
R&D intensity	−0.048	−0.043	−0.043	−0.026
	(0.60)	(0.60)	(0.60)	(0.59)
Advertising intensity	−8.102	−8.406	−9.139	−8.353
	(11.28)	(11.26)	(11.24)	(11.22)
Year dummies	Yes	Yes	Yes	Yes
CEO age	−0.002	−0.001	0.014	0.013
	(0.02)	(0.02)	(0.02)	(0.02)
CEO newness	−0.146	−0.134	−0.241	−0.233
	(0.19)	(0.19)	(0.21)	(0.21)
CEO salary	−0.006	−0.007	−0.005	−0.008
	(0.04)	(0.04)	(0.04)	(0.04)
CEO shares held	−0.005	−0.003	0.011	−0.005
	(0.05)	(0.05)	(0.05)	(0.05)
CEO sector experience	−0.016	−0.016	−0.014	−0.011
	(0.01)	(0.01)	(0.01)	(0.01)
Board independence	0.245	0.393	0.282	0.152
	(1.90)	(1.90)	(1.90)	(1.89)
Board CSR committee	−0.411	−0.339	−0.438	−0.392
	(0.63)	(0.63)	(0.63)	(0.63)
Shareholder concentration	−0.285	−0.448	−0.318	−0.543
	(1.59)	(1.59)	(1.59)	(1.59)
Level of BOD env'tal experience		−0.341†	−0.311	−0.325†
		(0.19)	(0.19)	(0.19)
CEO informal expert power			−0.893*	−1.083**
			(0.35)	(0.36)
CEO formal power over BOD			−0.115	−0.120
			(0.08)	(0.08)
CEO informal*formal power BOD				−0.339*
				(0.14)
Constant	8.766*	8.436*	8.266*	8.735*
	(3.43)	(3.43)	(3.48)	(3.48)
R^2 (within)–xtreg	4.38 %	4.68 %	5.51 %	6.04 %
R^2 (adjusted)–areg	95.43 %	95.44 %	95.47 %	95.49 %

$n = 1320$; † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 4 Fixed-effects regression of shareholder activism and power for environmental impact

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Firm performance	0.535	0.537	0.542	0.526	0.499	0.517
	(0.62)	(0.62)	(0.62)	(0.62)	(0.62)	(0.62)
Firm size	−0.527†	−0.469	−0.524	−0.545†	−0.487	(0.32)
	(0.32)	(0.32)	(0.32)	(0.32)	(0.32)	
Sales growth (1 year)	−0.053	−0.049	−0.053	−0.057	−0.056	−0.058†
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Leverage	−0.003	−0.007	−0.002	0.001	−0.002	−0.001
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Capital intensity	1.735	1.589	1.688	1.716	1.316	1.335
	(1.52)	(1.52)	(1.53)	(1.52)	(1.53)	(1.53)
R&D intensity	−0.057	−0.039	−0.053	−0.081	−0.040	−0.040
	(0.60)	(0.60)	(0.60)	(0.60)	(0.60)	(0.60)
Advertising intensity	−6.754	−7.317	−6.912	−9.843	−8.097	−9.636
	(11.29)	(11.27)	(11.31)	(11.32)	(11.30)	(11.30)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
CEO age	−0.000	−0.003	0.001	−0.000	0.013	0.012
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
CEO newness	−0.117	−0.123	−0.157	−0.161	−0.241	−0.247
	(0.19)	(0.19)	(0.21)	(0.21)	(0.21)	(0.21)
CEO salary	−0.006	−0.006	−0.005	−0.007	−0.006(0.04)	−0.006
	(0.04)	(0.04)	(0.04)	(0.04)		(0.04)
CEO shares held	−0.002	−0.008	−0.000	0.006	0.013	0.020
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
CEO sector experience	−0.016	−0.015	−0.015	−0.014	−0.015	−0.015
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Board independence	0.025	−0.099	−0.016	0.165	0.198	0.291
	(1.90)	(1.89)	(1.90)	(1.90)	(1.90)	(1.90)
Board CSR committee	−0.469	−0.534	−0.469	−0.549	−0.424	−0.497
	(0.63)	(0.63)	(0.63)	(0.63)	(0.63)	(0.63)
Shareholder concentration	−0.061	0.179	−0.103	−0.063	−0.273	−0.262
	(1.59)	(1.59)	(1.59)	(1.59)	(1.59)	(1.59)
Shareholder activism	−0.290	−0.181	−0.284	−0.249	−0.249	−0.260
	(0.27)	(0.27)	(0.27)	(0.27)	(0.27)	(0.27)
CEO informal expert power	−0.965**	−0.711†	−0.931*	−0.904*	−0.911**	−0.892*
	(0.35)	(0.36)	(0.37)	(0.36)	(0.35)	(0.35)
Activism*CEO informal power		−1.278*				
		(0.51)				
Level of TMT env'tal experience			−0.198	−0.074		
			(0.72)	(0.72)		
CEO formal power over TMT			−0.026	0.009		
			(0.06)	(0.06)		
Activism*CEO formal power TMT				−0.334**		
				(0.12)		
Level of BOD env'tal experience					−0.300	−0.315†
					(0.19)	(0.19)
CEO formal power over BOD					−0.113	−0.080
					(0.08)	(0.08)

Table 4 continued

Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Activism*CEO formal power BOD						−0.315*
						(0.14)
Constant	9.447**	9.125**	9.407**	9.523**	8.294*	8.025*
	(3.43)	(3.42)	(3.47)	(3.46)	(3.48)	(3.47)
R^2 (within)–xtreg	5.16 %	5.75 %	5.18 %	5.87 %	5.59 %	6.03 %
R^2 (adjusted)–areg	95.46 %	95.48 %	95.45 %	95.48 %	95.47 %	95.49 %

$n = 1320$; $^{\dagger}\ p < 0.10$, * $p < 0.05$, ** $p < 0.01$

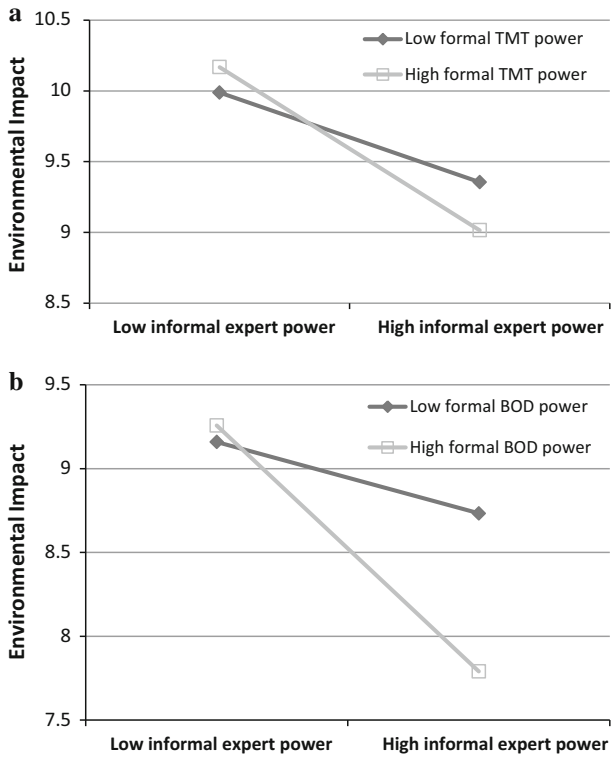

Fig. 1 **a** Interaction plot—informal expert power and formal TMT power. **b** Interaction plot—informal expert power and formal BOD power

formal power over the TMT did not make a statistical difference. Figure 1b shows a lower environmental impact with high informal expert power, and this effect was stronger with high formal BOD power. Figure 2a–c indicates that the presence of shareholder activism did not always improve (i.e., lower) environmental impact. Indeed, it was only firms whose CEOs had high informal expert power (Fig. 2a) and high formal TMT and BOD power (Fig. 2b, c respectively) that were able to translate this pressure into meaningful action.

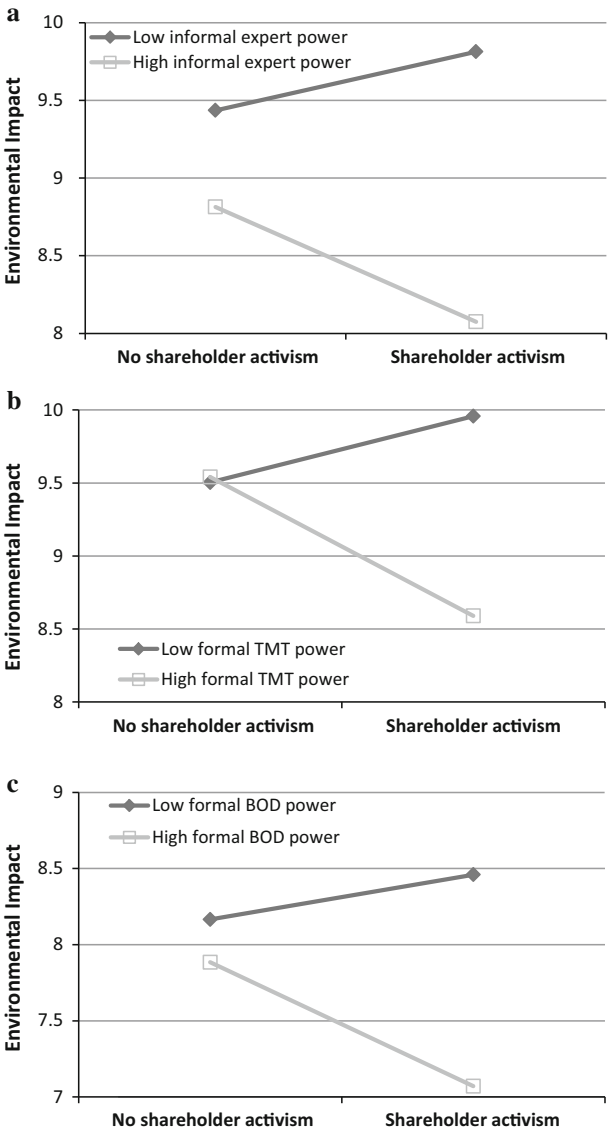

Fig. 2 **a** Interaction plot—shareholder activism and informal expert power. **b** Interaction plot—shareholder activism and formal TMT power. **c** Interaction plot—shareholder activism and formal BOD power

Robustness Tests

We conducted a number of robustness tests to assess the sensitivity of our results. Since the majority of control variables were not statistically significant, we re-ran the regressions using random-effects models that included dummy variables for industry and state. These models showed that the majority of the variance was captured by industry dummies, and some state-level dummies (but not other control variables). Nevertheless, our hypothesized results did not change in these models. We speculate that the lack of significance in control variables could be due to our dependent variable using Trucost data which differs from measures used in most environmental performance studies in that it captures actual footprint rather than more symbolic environmental efforts. More extensive research would need to be done to verify this conjecture.

Second, we split our sample into thirds, based on CEO formal power over the TMT and BOD, respectively, to observe if our effects held. The results indicated support for all our regressions using BOD, and in addition sharpened the results for TMT regressions. In the split data, results showed that CEO informal expert power mattered most when CEO formal power over the TMT was low.

A third series of tests were run to assess whether our results were affected by multicollinearity and sample selection concerns. The reason we investigated this was because the correlation between CEO informal power and environmental impact was positive ($r = 0.35$) in Table 2, but negative in the regression models. To ensure that this was not due to multicollinearity we ran the Stata-coldiag2-command. This test showed that firm size, board independence, and possibly CEO age were potentially causing problems. We re-ran all our models excluding these variables, but our regression results did not change. We then considered sample selection bias. That is to say, firms that already have a large environmental footprint might seek to hire CEOs with environmental expertise (i.e., high informal power) in order to address this issue. We ran a two-stage Heckman selection procedure, to control for this possible bias, but the regression results held.

Discussion

This paper aims to provide a more fine-grained understanding of CEOs' ability to leverage social sources of power to direct their companies on a path toward environmental sustainability. In general, our results show that CEOs' informal environmental expert power is associated with improved environmental performance for firms. We also find that CEOs' formal power over the BOD moderated this relationship, but there is no evidence of formal TMT power as a moderator. Our results additionally show that all types of CEO power strengthen the relationship between shareholder activism for corporate greening and lower environmental impact. This suggests that in the absence of shareholder activism, CEOs' informal environmental expert power is an important determinant of firm environmental performance, but in the presence of shareholder activism, CEOs can use any source of power to instigate environmental improvements.

Implications for Scholarly Research

Traditionally, research on environmental management and CSR has focused on understanding how macro-level forces affect firm-level outcomes. More recently, scholars have analyzed the micro-foundations of environmental behaviors by focusing on individual characteristics and preferences (Cordano and Frieze 2000; Lewis et al. 2014; Sharma 2000; Waldman and Siegel 2008). However, these two streams of research have largely burgeoned orthogonally. Our work helps to close the gap by showing that effective implementation of environmental practices in organizations substantially depends on their leaders. Because CEOs are at the apex of their organization, they have the potential to shape firm outcomes. However, to fully realize this potential, managers must enjoy both formal and informal power.

More specifically, this study shows that while CEOs' informal power emanating from their environmental expertise has a direct effect on corporate environmental performance, formal sources of power constitute an effective catalyst, particularly when the CEO has power over the board. Moreover, both types of CEO power are effective to convert pressure from shareholders into a lower environmental footprint. Accordingly, we respond to the recent calls in CSR research to integrate macro- with micro-based literatures (Siegel 2014). In this sense, our work confirms the need to account for managerial characteristics when analyzing organizational and field-level environmental issues.

Moreover, our work contributes to the literature on power. We rely on the accepted notion that formal and informal power are distinct but related constructs, but we take one step further to understand the intertwined nature of these two dimensions. We show that in the context of corporate environmentalism, the greatest improvement arises when CEOs' informal power is coupled with CEOs' formal power over the board. This suggests that informal and formal sources of power are not substitutes of one another but complements. By contrast, CEOs' formal power over top managers, when combined with informal expert power, does not seem to result in environmental performance. We conjecture that CEO control over the board is perhaps more critical to corporate greening than CEO power over the TMT.

We also find that any source of power, whether informal or formal, interacts positively with shareholder activism for corporate greening. While informal power may be the most relevant for a direct effect on environmental performance to stimulate others in the firm to enact the CEO's vision, the presence of shareholder activism brings attention and urgency to environmental issues, allowing CEOs to use any source of power to enact relevant strategies. Thus, our analysis suggests that formal CEO power, whether over the TMT or the BOD, is a sufficient condition to render pressures for corporate greening into action. We speculate that CEOs with formal power may delegate the task of addressing environmental issues to other managers in the company who have the right experience while supporting such actions via formal position and official sanction. It also suggests that shareholder activism on its own may not be enough to spur companies to improve their environmental footprint; only companies with powerful CEOs can respond effectively to such pressures. More research needs to be done to stipulate the process of how CEOs transform pressures into action for corporate greening.

Our study also contributes to power studies conducted in the field of ethics. Work in this stream has sought to understand the use of CEO power for opportunistic and self-serving reasons (Werbel and Carter 2002), leading to noxious consequences such as the abuse of power (Vredenburgh and Brender 1998) and narcissistic behaviors that result in fraud (Rijsenbilt and Commandeur 2013). In contrast to this "dark side" perspective, our paper offers a more positive view of power—one that allows the individuals to make responsible use of power to engage in ethical and environmentally beneficial corporate action.

Indirectly, we contribute to the emerging stream of literature on the intersection between corporate governance and environmental management (Walls et al. 2012). We show that CEO power operates as an important amplifier of the complex ties between shareholder pressure and firm performance. Much of the traditional literature on corporate governance and strategy considers too much CEO power as disruptive. By contrast, our work suggests that CEO power may be a necessary condition for meaningful environmental performance. We thus add to a nascent body of work that argues different corporate governance mechanisms are needed for different contexts (Aguilera et al. 2015; Walls et al. 2012).

Implications for Practice

Managers should realize that a lack of power may be an important barrier to the implementation of social practices (Chin et al. 2013). Thus, managers who aim to pursue an environmental agenda may need to secure power from both their expertise (informal) and their relative position (formal) within their organization. As our study suggests, CEOs with both sources of power are in a better position to foster environmental improvements. For practitioners gaining expertise, such as through training or involvement in environmental matters, can be an important source of power to influence their firm strategy.

Our work also provides insight for shareholder activism. Shareholders who are concerned about the environment should focus their efforts in companies that are managed by experienced, powerful CEOs. Without the support and experience of the top manager in the firm, and the level of influence CEOs have over the board, shareholders will face severe difficulties in pressuring firms' environmental performance through shareholder proposals. That is, if a powerful CEO is not in place, shareholder activism by itself may not translate into firm-based action.

Caveats and Future Research

Our work has limitations that can be rectified in future research endeavors. By focusing our dependent variable on the direct impact of a company's activities on the natural environment, we cannot capture how powerful CEOs might respond to pressures from the institutional field to adopt other, perhaps more symbolic, environmental practices (Berrone et al. 2013). Studying such responses may give interesting insights into the way CEOs use their power with less definitive practices to appease stakeholder concerns. Managers are particularly likely to adopt such practices when they perceive low economic or social gains from strategic initiatives, as they are more likely to manipulate the criteria or conditions of conformity (Oliver 1991).

Our work also provides opportunities for some interesting extensions. For instance, in our work, the range of the effect of CEOs' informal 'expert' power is restricted to CEOs' relevant area of expertise. In other words, we do not anticipate that CEOs' informal expert power *based on environmental experience* is relevant to other (non-environmental) strategic outcomes. Nevertheless, future research can explore the extent to which our results may be generalizable to other types of informal expert power. For example, in the case of ethical crises, CEOs with expertise in ethics may enhance stakeholder acceptance and legitimacy.

Finally, another intriguing avenue for research is a longitudinal investigation of the different roles of CEOs' informal and formal power in the adoption of environmental practices. We conjecture that CEOs' informal power, for instance, may have greater importance in the early stages of implementing environmental action when ideas are presented and stakeholder engagement is necessary, whereas CEOs' formal power may have a greater effect in the later stages of pursuing this agenda when the focus is on continual improvement and innovation to execute this agenda.

Conclusion

An overarching conclusion of our work is that the power of one can make a difference. CEOs are uniquely positioned within firms to enact their personal agendas and those placed on their shoulders by outsiders. Power affords CEOs the tools to execute such strategies. Informal environmental expert power allows CEOs to navigate the complexities of issues related to environmental sustainability in shaping corporate action, whereas formal sources of power rooted in CEOs' level of influence over the executive suite and board members act as a complement to informal sources of power. Both types of power can help translate pressure from important stakeholders into meaningful action.

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