



The Acquisitive Nature of Extraverted CEOs

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Abstract

This study examines how extraversion, a personality trait that signifies more or less positive affect, assertive behavior, decisive thinking, and desires for social engagement, influences chief executive officers' (CEOs') decisions and the ensuing strategic behavior of firms. Using a novel linguistic technique to assess personality from unscripted text spoken by 2,381 CEOs of S&P 1500 firms over ten years, we show that CEOs' extraversion influences the merger and acquisition (M&A) behavior of firms above and beyond other well-established personality traits. We find that extraverted CEOs are more likely to engage in acquisitions, and to conduct larger ones, than other CEOs and that these effects are partially explained by their higher representation on boards of other firms. Moreover, we find that the acquisitive nature of extraverted CEOs reveals itself particularly in so-called "weaker" situations, in which CEOs enjoy considerable discretion to behave in ways akin to their personality traits. Subsequent analyses show that extraverted CEOs are also more likely than other CEOs to succeed in M&As, as reflected by stronger abnormal returns following acquisition announcements.

Keywords: personality, chief executive officers, mergers and acquisitions, extraversion

The personalities of chief executive officers (CEOs) affect not only their own individual behavior but also the behavior of the firms they lead (e.g., Hambrick and Mason, 1984; Hiller and Hambrick, 2005). A dominant area in the field of strategic management focuses on the role of top executives in consequential strategic choices, such as engaging in mergers and acquisitions (M&As). For CEOs, the choice to acquire involves many decisions, such as whether, what, when, and for how much to acquire. As outcomes are highly uncertain and ambiguous, and opportunity costs are difficult to determine, there is considerable room for subjective influences in the form of personal preferences, biases,

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and personality (e.g., Chatterjee and Hambrick, 2011; Zhu, 2013; Malhotra, Zhu, and Reus, 2015). This has led scholars to study a wide range of CEO features, such as how CEOs' self-interested motivations (e.g., Sanders, 2001), hubris or overconfidence (Roll, 1986; Hayward and Hambrick, 1997; Malmendier and Tate, 2008), narcissism (Chatterjee and Hambrick, 2007), regulatory focus (Gamache et al., 2015), and even testosterone levels (Levi, Li, and Zhang, 2010) influence M&A activity.

Yet while scholars agree that a CEO's personality matters, there are at least three important shortcomings in our current knowledge. First, there is little systematic research on theories of core personality traits (for important exceptions, see Peterson et al., 2003; Giberson et al., 2009; Nadkarni and Herrmann, 2010; Herrmann and Nadkarni, 2014). Considering that the trait of extraversion is central in leadership research (e.g., Bono and Judge, 2004), it is particularly surprising that there is limited research on CEOs' extraversion. Extraversion is one of the Big Five personality traits, the others being openness, conscientiousness, agreeableness, and emotional stability (Digman, 1990; Goldberg, 1990; Costa and McCrae, 1992, 2008; John and Srivastava, 1999). Extraversion reflects a tendency for positive affect, assertive behavior, decisive thinking, and a desire for social engagement (Wilt and Revelle, 2009, 2016)—characteristics that may help explain why extraverted CEOs seek and enjoy large-scale growth opportunities, spot such growth opportunities more readily than other CEOs, view them more positively, and are more likely to transform these opportunities into collective action. We expect extraverted CEOs to have a more acquisitive nature than other CEOs.

Second, though scholars have linked CEOs' personality to firms' behavior, the mechanisms through which this link can be explained are rarely examined empirically. We examine CEOs' representation on boards as one potentially important mediating mechanism: because of their assertiveness, ambition, and desire for social engagement, extraverted CEOs are likely to seek out and attain more board memberships, which provide valuable information and how-to knowledge for CEOs to identify and act on potential acquisition opportunities quickly. Therefore we examine empirically whether the size of CEOs' board networks partially explains why CEOs' extraversion influences M&A behavior.

Third, there is limited understanding of *when* a CEO's personality matters, which is surprising because personality scholars generally agree that behavior is a joint function of individual differences and situational characteristics (e.g., Mischel, 1977a, 1977b). The influence of personality depends on situational strength—i.e., whether the situation prescribes formal and informal rules that constrain people in their behavioral options (Mischel, 1977b). For CEOs, situational strength likely constrains the influence of personality not only on individual behavior but also on firms' behavior. We consider two "weak" situations in which CEOs' personality will have a stronger influence on M&A behavior: reduced competition and high levels of managerial entrenchment.

Another important and related question is whether CEOs' extraversion influences M&A performance. Since the M&A boom of the 1990s, firms have spent trillions of dollars on M&As, even though many M&As have destroyed value (e.g., Moeller, Schlingemann, and Stulz, 2005). An underlying theme in the M&A literature therefore has been which CEO personality dimensions might help explain the large destruction of value through M&As. CEOs' hubris and narcissism are palpable examples, and previous research has shown that these

personality dimensions can lead to higher M&A premiums or irregular performance (e.g., Roll, 1986; Hayward and Hambrick, 1997; Chatterjee and Hambrick, 2007). In contrast, extraversion has been linked to effective and transformational leadership (e.g., Bono and Judge, 2004; Do and Misbashian, 2014). Thus we explore whether extraverted CEOs are not only more likely to engage in M&As but are also more likely to create rather than destroy value through M&As.

Most studies on CEO personality have been limited to small samples and specific industries or have used remote proxies, limiting generalizability. Clearly, it is difficult to obtain in-depth personality assessments or self-assessments from busy top executives, although Nadkarni and Herrmann (2010) and Hermann and Nadkarni (2014) were able to obtain Big Five personality scores through self-report surveys of Indian and Ecuadorian CEOs. For our own study, recent developments in computer programming gave us the opportunity to use a novel technique to study a large, cross-industry sample of 2,381 CEOs of S&P 1500 firms. We obtained non-scripted conversations between CEOs and shareholders over a ten-year period (2002–2012) and ran a linguistic application, resulting in a unique database of CEOs' personality scores. Using these data, we examine whether, why, and when CEO extraversion might influence M&A behavior, also providing insight into how CEOs' extraversion is related to value creation following M&As.

THEORY

Extraversion and Leadership

Extraversion is a fundamental personality trait, but the concept and what constitutes it have evolved considerably over time (for reviews, see Watson and Clark, 1997; John and Srivastava, 1999; Wilt and Revelle, 2009, 2016). In their reviews of the extraversion literature, Wilt and Revelle (2009, 2016) built on the notion that personality traits are abstractions that describe coherence in affect, behavior, cognition, and desire (the "ABCD" of personality). They explained that extraversion reflects the likelihood that people experience or display positive affect, assertive behavior, decisive thinking, and desires for social engagement and attention.¹ Positive affect is a tendency to experience more positive than negative emotions, such as excitement and happiness, which some scholars suggest is the glue that holds together extraversion's lower-order facets of affiliation, energy, and ascendancy (Tellegen, 1985; Watson and Clark, 1997). Other scholars have emphasized extraverts' assertive behavior, stemming from their inclination to display approach behavior rather than avoidance behavior (e.g., John and Srivastava, 1999). In their Five Factor Model, Costa and McCrae (1992) emphasized that while a disposition to engage in social behavior explains lower-order facets of warmth and gregariousness, it also explains assertiveness, activity, excitement seeking, and positive emotion. Moreover, extraverts, through their social dispositions, influence the behaviors and emotions of others and thus create a more positive social environment around them (Eaton and Funder, 2003). In terms of cognition, scholars have linked extraversion to

¹ Although early research also associated impulsivity with extraversion (e.g., Eysenck, 1959; Eysenck and Eysenck, 1975), there is now general agreement that the two should be viewed as independent (Watson and Clark, 1997).

people's tendency to view neutral environments more positively (Uziel, 2006) and recognize positive stimuli more quickly (Robinson, 2007). Extraverts are also more decisive than other people (Wilt and Revelle, 2016)—their ability to deal with situations in which multiple stimuli compete for attention may explain why they are more likely to excel in complex environments (Matthews, Deary, and Whiteman, 2003).

Reflecting on these variations, several scholars have argued that desires for interpersonal engagement that characterize extraverts have two components (e.g., Tellegen, 1985; Wiggins, 1991; Depue and Collins, 1999; Morrone-Strupinsky and Lane, 2007). First, affiliation captures "getting along" tendencies, including enjoying and valuing close interpersonal bonds, and being warm and affectionate, as reflected in lower-order facets such as gregariousness (Costa and McCrae, 1985), social closeness (Depue and Collins, 1999), and sociability (Guilford and Zimmerman, 1947). Second, agency refers to "getting ahead" tendencies, including enjoying and valuing being a differentiated individual within a social group, as reflected in lower-order facets such as urgency or ambition (Hogan, 1983; Costa and McCrae, 1985), social potency (Depue and Collins, 1999), and ascendance (Guilford and Zimmerman, 1947).

Of the Big Five personality traits, extraversion is the strongest and most consistent predictor of leadership emergence and of transformational and effective leadership (Judge et al., 2002; Bono and Judge, 2004). A recent meta-analysis indicated that this effect on leadership outcomes is due to the agentic facets of extraversion (Do and Minbashian, 2014). Affiliative and agentic tendencies both concern a desire for and sensitivity to social engagement, yet there are important motivational and emotional differences. Affiliation captures efforts to socialize and to achieve close connections for their own sake, regardless of whether they help with achieving organizational or work-related goals. After controlling for agentic aspects, such affiliative aspects of extraversion are unrelated to transformational leadership and are negatively related to effective leadership, perhaps because efforts to get along may prevent leaders from making difficult decisions that are often necessary to lead effectively (Do and Minbashian, 2014). In contrast, agency captures a tendency toward social ascendancy that prompts extraverts to achieve social connections not only for their own sake but also to influence and persuade others to pursue collective goals (Depue and Collins, 1999; Morrone-Strupinsky and Depue, 2004). Moreover, agency is associated with highly activated emotional states, such as excitement, joy, energy, and confidence (Watson and Clark, 1997), which allow extraverts to inspire others by conveying an optimistic vision and to display an intense enthusiasm for how to achieve that vision. There is some evidence that these contrasting effects between agentic and affiliative aspects of extraversion may become more pronounced for top managers (Do and Misbashian, 2014).

Given that extraversion is the strongest and most consistent personality predictor of effective and transformational leadership, it is surprising that scant research has investigated the role of CEOs' extraversion. A few studies have underscored its relevance, as scholars have found that CEOs' extraversion is related to top management teams' perceptions of CEOs' dominance (Peterson et al., 2003) and to a firm's strategic flexibility and strategic change initiatives (Nadkarni and Herrmann, 2010; Herrmann and Nadkarni, 2014).

CEO Personality and M&As

In his seminal work, Roll (1986: 199) stressed that although economists' assumption of rationality may hold under many conditions, it should be abandoned for M&As because "takeovers reflect individual decisions." In pursuit of M&As, senior management, and CEOs in particular, seem to have considerable latitude. For this reason, a dominant stream of M&A research has considered the role of CEOs' personality, making it important to compare and contrast extraversion to related personality constructs that have received attention.

Roll's (1986) unease with rational explanations for M&As led him to introduce the hubris hypothesis, whereby he argued that the exaggerated self-confidence among some CEOs explains why they attempt to build empires and why they overestimate their capacity to generate returns from M&As. Hubristic or overconfident CEOs have been found to make more M&As, pay higher premiums, and destroy more value than other CEOs (e.g., Hayward and Hambrick, 1997; Malmendier and Tate, 2005, 2008). Extraverts' positive affect is in part reflected by their self-confidence (e.g., Diener and Fujita, 1995) or self-esteem (e.g., Cheng and Furnham, 2003); they are often viewed as strong, confident individuals (Watson and Clark, 1997). Extraversion has also been linked to overconfidence—greater confidence unmatched by greater accuracy in cognitive tasks (Schaefer et al., 2004). For complex tasks, however, extraverts' greater confidence may be matched by related agentic qualities, such as their ambition and energy and their ability to bring others into the fold. Scholars have argued that extraverts are more likely to be transformational leaders not just because they are more confident but also because they generate confidence among others (Bono and Judge, 2004).

Scholars have also emphasized CEOs' narcissism—excessive interest in, or admiration of, oneself (e.g., Chatterjee and Hambrick, 2007)—involving an intense need to confirm one's own superiority and to be in the spotlight, which results in favoring visible and bold actions to attract attention and receive applause (e.g., Wallace and Baumeister, 2002). M&As, especially large ones, appeal to narcissistic CEOs (e.g., Chatterjee and Hambrick, 2007, 2011; Zhu and Chen, 2015). Extraversion and narcissism share some features such as boldness, self-confidence, and a desire for social attention (Wilt and Revelle, 2009), and narcissists have been labeled "disagreeable extraverts" as they have high extraversion and low agreeableness scores (Paulhus and Williams, 2002). When it comes to leadership, extraversion may be a more constructive trait than narcissism: a recent meta-analysis revealed that extraversion explains the positive effect of narcissism on leadership emergence (Grijalva et al., 2015), and while extraversion relates to leadership effectiveness (Judge et al., 2002), narcissism does not (Grijalva et al., 2015).

Using regulatory focus theory (Higgins, 1998), Gamache et al. (2015) argued that CEOs with a promotion focus (preferring gains and growth), rather than a prevention focus (preferring stability and security), are more likely to conduct M&As because they have higher aspirations for their firms and view more opportunities for growth. The positive affect, reward sensitivity, and approach behavior of extraverts (Watson and Clark, 1997; John and Srivastava, 1999; Lucas et al., 2000) are clearly associated with this promotion focus, and a recent meta-analysis affirmed that extraverts are more likely to have this focus (Gorman et al., 2012).

CEOs' Extraversion and Firms' M&A Behavior

We argue that more-extraverted CEOs participate in more M&A activity than other CEOs due to their tendency to seek and enjoy large-scale growth opportunities, spot acquisitive growth opportunities and view these opportunities more positively, and transform these opportunities into collective action. Considering that CEOs likely attain their positions not just by getting along with others but also by having a drive to get ahead together with others (cf. Do and Minbashian, 2014), this effect likely is influenced more by agentic rather than affiliative aspects of extraversion.

Extraverted CEOs are more likely to seek and enjoy large-scale growth due to their distinctive motivational tendencies. M&As generally prompt the involvement of many parties, including boards, consultants, lawyers, regulators, and target firm members, and they attract considerable media attention (e.g., Liu and McConnell, 2013). Though less extraverted CEOs may view such stakeholder interaction as necessary but challenging, more-extraverted CEOs enjoy and may actively seek such interaction (e.g., Ashton, Lee, and Paunonen, 2002; Wilt and Revelle, 2016). Moreover, extraverted CEOs are more likely to seek ambitious growth plans like M&As because they have more of a promotion than prevention focus (Gorman et al., 2012).

Extraverted CEOs are also likely to have greater access to information about M&A opportunities. A recent meta-analysis by Fang et al. (2015) indicated that while more-extraverted people may not take a more-central place than others in expressive networks of friendships, they do so in instrumental networks that have a job- or firm-related purpose. Fang et al. (2015) also showed that extraverts seek brokerage roles in such instrumental networks and emphasized agentic features—assertiveness and ambition—to explain this effect. Such instrumental networks are a critical source of task-related knowledge, expertise, and information (e.g., Forret and Dougherty, 2001), and for CEOs they provide a rich source of growth opportunities. Extraverted CEOs likely will interact more in instrumental networks, and as a result they more often engage with other CEOs, board members, and consultants at work and social events where critical M&A-related information is shared, thus increasing the likelihood that extraverted CEOs spot M&A opportunities and attractive targets before their less extraverted counterparts.

Because of their positive affect and promotion focus, extraverted CEOs also are more likely than other CEOs to perceive growth opportunities more positively and to consider more positive information on potential targets. Moreover, because of their higher level of engagement with the environment and their approach temperament (Watson and Clark, 1997; John and Srivastava, 1999), extraverted CEOs likely are more enthusiastic about growth opportunities (Gorman et al., 2012). In contrast, less extraverted CEOs may perceive and emphasize more hurdles and caveats, and they may consider more negative and neutral information in combination with positive information.

Finally, extraverted CEOs likely act on M&A opportunities more successfully than other CEOs and generate the necessary collective action for completing these deals. Extraverts excel when placed in complex environments, as they are more assertive and decisive (Wilt and Revelle, 2016) and are more likely to influence and persuade others to join the effort (cf. Morrone-Strupinsky and Depue, 2004). In the context of M&As, extraverted CEOs will be better at

sifting through contradictory information and divergent stakes, and with their optimistic perspective and transformational leadership style (Bono and Judge, 2004; Do and Minbashian, 2014), they are more likely to bring others into the fold by instilling confidence and enthusiasm.

These effects on seeking, spotting, positively valuing, and acting on M&A opportunities likely also influence the size of deals done by extraverted CEOs. Larger deals are more complex and more likely affect the firm as a whole, and they exert greater influence on more diverse stakeholders (e.g., Chatterjee, 2009; Ellis et al., 2011). As such, compared with smaller deals, larger deals require more social engagement and more persuasion and enthusiasm to rally the troops. Thus we expect extraverted CEOs to make not only more M&As but also larger M&As.

Hypothesis 1a (H1a): CEO extraversion is positively related to a firm's M&A likelihood.

Hypothesis 1b (H1b): CEO extraversion is positively related to a firm's M&A deal size.

The Mediating Effect of a CEO's Board Network

The effect of CEOs' extraversion on M&A behavior may be explained, in part, by their board networks because of the importance of board networks in identifying M&A opportunities and the higher likelihood of extraverted CEOs being on other firms' boards. For CEOs, board networks often are the most influential sets of connections among their instrumental networks. Board activities provide CEOs with rich information on industry trends, market conditions, latest business practices, and private insights into other firms. Such insights directly affect CEOs' decision making and, as a result, the behavior and performance of their firms (Haunschild and Beckman, 1998; Westphal, 1999; Larcker, So, and Wang, 2013).

There are many ways in which M&A opportunities surface in board-related meetings or social events (cf. Haunschild and Beckman, 1998). Connected board members may know of attractive targets, serve on boards of targets, and discuss acquirers that are seeking targets (Haunschild, 1993). Board networks provide valuable, private information on potential target firms, which helps reduce information asymmetry and expedite M&A decisions (Cai and Sevilir, 2012; El-Khatib, Fogel, and Jandik, 2015). They also are a source of how-to knowledge for doing M&As, enabling CEOs to learn from network partners about which investment bankers to use, how to structure deals, how to deal with competing bids, etc. (Haunschild, 1993).

Board positions require commitment and regular interactions with other members. Considering that extraverts tend to take a more-central place in instrumental networks than their peers and are more likely to connect with others in these networks (Fang et al., 2015), extraverted CEOs should be more likely to be asked to serve and stay on boards. Given their desire for social engagement (Costa and McCrae, 1985; Wilt and Revelle, 2016), extraverted CEOs should also be more likely to actively pursue and accept these invitations than their less extraverted counterparts.

Extraverted CEOs likely seek board memberships not merely for the sake of socializing but because their ambition, energy, and assertiveness lead them to

actively build these influential networks with an eye for growth opportunities (cf. Do and Minbashian, 2014; Fang et al., 2015). Thus extraverted CEOs are more likely to seek central positions in board networks, which may give them better insights into M&A opportunities. Indeed, highly connected CEOs seem to make more M&As (El-Khatib, Fogel, and Jandik, 2015). As such, we propose that:

Hypothesis 2a (H2a): CEOs' board network size partially mediates the positive relationship between CEOs' extraversion and firms' M&A likelihood.

Hypothesis 2b (H2b): CEOs' board network size partially mediates the positive relationship between CEOs' extraversion and firms' M&A deal size.

The Moderating Influence of Situational Strength

The strong-situation hypothesis suggests that variance in situational strength influences the extent to which personality affects behavior (for reviews, see Cooper and Withey, 2009; Meyer, Dalal, and Hermida, 2010). In strong situations, prescribed rules dictate appropriate behavior, allowing little margin for personality to influence behavior. In weak situations, people enjoy more discretion to behave in ways guided by their personality. Mischel (1977b) suggested that situations are likely to be stronger when people have similar interpretations of the situation, have uniform expectations about the most appropriate response in the situation, see acceptable incentives for that response, and perceive that they have the skills necessary to construct and execute the response. When it comes to the influence of CEOs' extraversion on M&A behavior, we expect industry competitiveness and managerial entrenchment to be powerful indicators of situational strength.

Industry competitiveness. Industry competitiveness refers to the number of firms competing for the same product market (Porter, 1980; Eisenhardt and Schoonhoven, 1996). In terms of situational strength, it indicates whether CEOs and others have clear and consistent information that pursuing M&As is an adequate response to competitive dynamics.

In highly competitive industries, speed to market is crucial (Brown and Eisenhardt, 1998), and firms—as well as industry experts, consultants, and investors—perceive a constant pressure to grow profits and fend off competitive actions (Eisenhardt, 1989; D'Aveni, 1994). CEOs have strong incentives to seek new growth opportunities and to act fast to stay competitive (Aghion et al., 2001). M&As are widely considered to be a critical strategic tool and to be important for success and survival in such industries, as alternatives tend to be too slow. Most CEOs, regardless of personality, see logic in pursuing M&As to stay agile in these markets, and persuading others is easy because they also more readily see M&As as a salient option. Thus in the most competitive industries, M&As are the norm.

In contrast, there are no strong predefined norms about pursuing M&As in less competitive industries. Firms can take more time to grow, and they face fewer direct competitive threats and experience less volatility. This situation provides more scope for options regarding growth and speed (D'Aveni, 1994), so CEOs in less competitive industries enjoy more discretion to either pursue a

steady course or push for rapid growth. Less fiercely competitive industries are akin to weak situations, in which there is less clear or consistent information about whether M&As are an adequate response, allowing more room for preferences fueled by personality (cf. Mischel, 1977b; Meyer, Dalal, and Hermida, 2010). Less extraverted CEOs are more likely than extraverted CEOs to feel comfortable keeping a steady course. With less need for speedy or bold moves, the predisposition of less extraverted CEOs to emphasize more neutral and negative information (e.g., Watson and Clark, 1997) constrains the pursuit of M&As. Even when perceiving M&A opportunities, less extraverted CEOs might find it harder to convince diverse stakeholders who do not readily accept the need for acquisitive growth in less competitive industries.

In such industries, the acquisitive nature of extraverted CEOs likely reveals itself more distinctly because of their persistent ambition and their desires for social engagement and attention (e.g., Wilt and Revelle, 2016). Particularly when the situation does not readily call for acquisitive growth, the persuasive nature of extraverted CEOs can make a difference. Thus when an industry is less fiercely competitive, we expect a clearer distinction in the influence of CEOs' extraversion on M&A behavior.

Hypothesis 3a (H3a): Industry competitiveness moderates the relationship between CEOs' extraversion and firms' M&A behavior, such that in less competitive industries, the relationship between CEOs' extraversion and firms' M&A likelihood will be stronger.

Hypothesis 3b (H3b): Industry competitiveness moderates the relationship between CEOs' extraversion and firms' M&A behavior, such that in less competitive industries, the relationship between CEOs' extraversion and firms' M&A deal size will be stronger.

Managerial entrenchment. Corporate governance is intended to put controlling and monitoring provisions in place to assure the suitable alignment of a CEO's behavior with the interests of a firm's owners and other stakeholders (e.g., Forbes and Milliken, 1999; Daily, Dalton, and Cannella, 2003; Finkelstein, Hambrick, and Cannella, 2009). Managerial entrenchment reflects a lack of such provisions. Agency theorists have long argued that managers of public corporations may make self-interested decisions that may destroy corporate wealth (e.g., Jensen and Meckling, 1976), and research has focused on when conflicts of interest between managers and owners likely arise and which tools can be used to reduce them (e.g., Shleifer and Vishny, 1997; Dalton et al., 2007; Misangyi and Acharya, 2014). Corporate governance provisions not only constrain self-interest but also curb CEOs to act more generally according to stakeholders' terms (Finkelstein and D'Aveni, 1994).

Managerial entrenchment reflects the extent to which CEOs have the freedom to behave in accordance with their own personalities and thus reflects a form of situational strength. Bebchuk, Cohen, and Ferrell (2009) found that managerial entrenchment depends on whether board elections are staggered (i.e., only a fraction of the board is elected at one time), shareholder amendments of the bylaws are limited, and supermajority requirements are in place for both M&As and charter amendments. Each of these indicators gives CEOs increased protection from removal or the consequences of removal from the

firm (Bebchuck, Cohen, and Ferrell, 2009). Managerial entrenchment weakens the disciplinary power of the shareholders and the board, and it allows CEOs greater discretion and autonomy to act on their own (Hambrick and Finkelstein, 1987; Hambrick, 2007).

In contrast, weaker entrenchment reflects stronger situations in which there are more clearly defined formal and informal rules or processes that must be followed, as well as stronger incentives for CEOs to abide by them (cf. Mischel, 1977b; Meyer, Dalal, and Hermida, 2010). Under more scrutiny from monitoring bodies, and checks and balances, CEOs have fewer opportunities to exhibit behaviors akin to their personalities. This is particularly relevant in the context of M&A decisions, as these tend to attract attention from many internal and external stakeholders.

Hypothesis 4a (H4a): Managerial entrenchment moderates the relationship between CEOs' extraversion and firms' M&A behavior, such that in firms with higher managerial entrenchment, the relationship between CEOs' extraversion and firms' M&A likelihood will be stronger.

Hypothesis 4b (H4b): Managerial entrenchment moderates the relationship between CEOs' extraversion and firms' M&A behavior, such that in firms with higher managerial entrenchment, the relationship between CEOs' extraversion and firms' M&A deal size will be stronger.

The Relationship between CEOs' Extraversion and Shareholders' Reactions to M&As

Though our main focus is on understanding whether, why, and when CEOs' extraversion influences M&A behavior, we also consider whether it influences shareholders' reactions to M&As. There is strong evidence that M&As generally destroy value for acquiring firms (e.g., Moeller, Schlingemann, and Stulz, 2005), but at least some of the qualities of extraverted CEOs may also translate into more positive reactions from shareholders.

M&A decisions are complex, both cognitively and socially. They involve uncertain, ambiguous, and often conflicting information, as well as heightened scrutiny from diverse stakeholders. Such a dynamic social environment is the natural habitat for extraverts; they tend to perform well under high time pressure and when multiple stimuli compete for attention (e.g., Matthews, Deary, and Whiteman, 2003; Roskes et al., 2013; Wilt and Revelle, 2016). Moreover, extraverted CEOs are more comfortable than other CEOs when engaging with many stakeholders and are more persuasive in presenting the case for undertaking an M&A.

The strong link between extraversion—particularly its agentic aspects—and transformational leadership (e.g., Bono and Judge, 2004; Do and Minbashian, 2014) is particularly relevant to M&A success because, by their very nature, M&As involve considerable change. Under these conditions, extraverted CEOs' ability to instill confidence and generate commitment among members of both the acquiring firm and the target is crucial. Extraverted CEOs are more likely than other CEOs to convey a clear vision, guide the change, inspire others, and execute the M&A together with committed organization members.

Whether shareholders will react more positively to M&As by extraverted CEOs, however, is not assured. Less extraverted CEOs also have qualities that

shareholders may value, such as tending to excel in tasks that require enduring, focused attention (Matthews, Deary, and Whiteman, 2003). Also, the leadership effectiveness of extraverts may be conditional—working well for obedient subordinates but evoking resistance among assertive subordinates (e.g., Grant, Gino, and Hoffman, 2011). Moreover, scholars have linked extreme extraversion to risk taking and the self-serving pursuit of adventure (Judge et al., 2002); M&As driven by such CEO behavior will evoke more negative reactions. As the link between CEOs' extraversion and shareholders' reactions is unclear, we consider it an important empirical question, which we address in the Results section.

METHODS

Sample and Data Collection

To compile our sample, we used ExecuComp, which covers firms that are, or have been, listed on the S&P 1500 Index. To assess extraversion (discussed below), we obtained transcripts from Thomson Street Events of all recorded conference calls that covered quarterly earnings announcements in which CEOs participated between 2002 and 2012, a total of 87,632 calls. After removing observations with missing data, the final sample included personality scores for 2,381 CEOs. We matched these CEO data with SDC Platinum data on M&As completed between 2002 and 2013. To ensure that the deals required CEOs' attention, we included deals worth at least 5 percent of the acquirer's value (cf. Malmendier and Tate, 2005, 2008; Yim, 2013), amounting to 1,710 deals that matched CEO-firm observations.²

Following Malmendier and Tate (2008), we analyzed firm-year observations of each focal firm by first aggregating M&A data by each calendar year and then merging firm-year observations with CEO-firm data. We excluded those firm-years in which there was a change of CEO to ensure that the CEO led the firm for the full calendar year. We supplemented these data with firm, industry, and board information from Compustat and BoardEx. After merging all variables and removing missing values, we had a final dataset of 10,166 CEO-firm-year observations.

The fields of psychology and computational linguistics have identified numerous personality markers in language (e.g., Argamon et al., 2005; Mairesse et al., 2007; Gow et al., 2016). A popular tool to analyze text is the Linguistic Inquiry and Word Count (LIWC) created by Pennebaker and colleagues (Pennebaker and King, 1999; Pennebaker, Francis, and Booth, 2001), which matches words in text using a dictionary of 80 psychologically relevant categories, such as positive or negative emotions, self-reflection, and causal thinking. Unfortunately, the LIWC does not provide direct measures of the Big Five personality dimensions.

Measuring Extraversion

In the past decade, much progress has been made in gauging personality from text. Notably, Mairesse et al. (2007) used computer programming to derive Big Five personality scores from conversations and texts. They started with two training datasets from Pennebaker and King (1999) and Mehl, Gosling, and Pennebaker (2006) that consisted of spoken texts and essays from people for

² Our results remain the same if we use all completed mergers and acquisitions.

Table 1. Ten Most Important Linguistic Features in Measuring Extraversion

Linguistic feature	Source	Description	Relation with extraversion	Weights
Unique	LIWC	Measure of repetition of words in a given text.	–	.6457
MEANP	MRC	Paivio meaningfulness, defined as the mean value of written associations people list with a word in 30 seconds. (Paivio, 1968)	+	.3553
We	LIWC	The relative number of times the first-person plural is used, e.g., “we,” “us,” “our” (11 words).	+	.2845
T-L-FREQ	MRC	Measure of how frequently words are used in the English language. (Thorndike and Lorge, 1944)	–	.2544
Number	LIWC	The relative frequency of numbers in the text, e.g., “one,” “thirty,” “million” (29 words).	–	.2468
Motion	LIWC	The relative frequency of words related to motion in the text, e.g., “walk,” “move,” “go” (73 words).	+	.2464
Insight	LIWC	The relative frequency of words related to insight, e.g., “think,” “know,” “consider” (116 words).	–	.2355
Up	LIWC	The relative frequency of words like “up,” “above,” “over” (12 words).	–	.2296
NLET	MRC	Average number of letters in a word.	–	.2282
WPS	LIWC	Average number of words per sentence.	+	.2219

whom Big Five scores were available from self-reports and independent observers. Based on previous research that linked measurable linguistic features to personality traits, they extracted relevant features from these texts, including frequency counts of 88 word categories from the LIWC and 14 additional features from the MRC Psycholinguistic database (Coltheart, 1981).³ For extraversion, important linguistic features include word count, word repetition, concreteness, imageability, and references to family and friends.

To model personality traits, Mairesse et al. (2007) used the LIWC and MRC features as data input for machine learning, through which algorithms are developed (or learned) from input data. Through machine learning the algorithm is improved by adapting weights assigned to linguistic features in the text so that there is a better match with the personality scores from self-reports and independent observers. Mairesse et al. (2007) tested the predictive power of the models using texts from individuals who were not included in the training samples, and their “support vector machine model” performed best across all Big Five dimensions.⁴ We therefore used this algorithm to predict CEO personality.⁵ Table 1 presents the ten most important linguistic features and their respective weights to measure extraversion. Figure A1 in the Online Appendix

³ The MRC contains a machine-usable dictionary of over 150,000 words providing information on 26 different linguistic properties, such as estimates of the age at which a word is typically learned, the commonality of a word, and the general exposure to a word.

⁴ A support vector machine training algorithm is a non-probabilistic binary linear classifier—it builds a model that assigns features to one category (e.g., less extravert) or another (more extravert). The features can be viewed as points in space, mapped so that the features of the separate categories are divided by a clear gap that is as wide as possible, and subsequent features are then mapped into that same space and predicted to belong to a category based on which side of the gap they fall on (Cortes and Vapnik, 1995). Mairesse et al. (2007) applied regression models to produce continuous scores rather than just classification.

⁵ Mairesse et al. (2007) made the algorithm available through a Java command-line application, “The Personality Recognizer,” that reads text files and computes estimates of personality scores along the Big Five.

(<http://journals.sagepub.com/doi/suppl/10.1177/0001839217712240>) provides an illustrative analysis on text produced during Apple's Q4 conference call in 2010 by Steve Jobs and Tim Cook, who have been compared to *Star Trek's* extraverted Captain Kirk and less extraverted Dr. Spock, respectively.⁶

Quarterly earnings conference calls with financial analysts generally have a presentation segment and a Q&A segment. The presentation segment is not suitable for assessing CEO personality because the text used in the presentation is likely to be scripted by others. In contrast, text spoken by a CEO in response to questions is more likely to be the CEO's own words and unscripted (Matsumoto, Pronk, and Roelofsen, 2011). Text spoken during the Q&A segment is particularly appropriate for assessing CEOs' extraversion because people tend to reveal variations in extraversion more readily under complex and stressful conditions (Dewaele and Furnham, 1999). Conference calls can be quite difficult for CEOs because questions from analysts often are direct and not easily anticipated, and answers can be consequential—capital markets respond instantly to information provided in these calls (Frankel, Johnson, and Skinner, 1999). Because they are held quarterly over multiple years, these calls capture various contextual settings over time, allowing us to assess long-term stable traits of CEOs (Li, 2010).⁷ Because longer texts yield more-reliable personality scores, we aggregated all texts spoken by the CEOs in the Q&A segment from calls between 2002 and 2012. We included only those CEOs for whom we had at least 500 spoken words; the average word count was 23,088 words, with a range of 506 to 113,956 words.

Validating the Extraversion Measure

Mairesse et al. (2007) conducted a series of validity checks, and to assure the instrument is also valid for a sample of CEOs, we conducted several additional checks. A first indication of clear convergent validity is reflected in the strong association between the raw number of words spoken and extraversion ($r = .50$; $p < .0001$), which scholars have identified as one of the strongest linguistic correlates with extraversion (Mehl, Gosling, and Pennebaker, 2006). Also, the measure relates to other variables that have been associated with extraversion in previous personality research, which we discuss in the Results section.

We also performed validity checks using security analysts (cf. Chatterjee and Hambrick, 2007) and two trained psychologists—a recruiter and an academic—who were asked to rate the extraversion of CEOs who varied according to the algorithm. The analysts assessed well-known CEOs in the industries they followed, and the psychologists assessed CEOs based on background articles and videos. The respondents completed five extraversion items from the Big Five personality inventory: (1) "this CEO is outgoing, sociable," (2) "this CEO is full of energy," (3) "this CEO has an assertive personality," (4) "this CEO is reserved" (reverse scored), and (5) "this CEO generates a lot of enthusiasm," which we averaged to obtain extraversion scores on a four-point scale (1 = not at all extravert, 2 = slightly extravert, 3 = moderately

⁶ www.macobserver.com/tmo/article/the-real-reason-apples-tim-cook-has-been-underestimated.

⁷ To check the time consistency of the personality scores, in separate analyses, we split the dataset into two periods, 2002–2007 and 2008–2012, and derived the extraversion scores for each CEO in the two periods. Both scores were highly correlated ($r = .5$; $p < .01$), indicating the scores reflect a more enduring trait of the CEOs.

extravert, 4 = highly extravert). From 19 analysts, we obtained 47 usable ratings on 12 CEOs, and from the two psychologists, we obtained 34 usable ratings on 17 CEOs.⁸ The single-item intraclass correlation was .85 ($p < .01$) and .60 ($p < .01$) for the analysts and the psychologists, respectively, indicating satisfactory agreement among respondents. Spearman's rank correlation coefficient between the average rating for each CEO and the algorithm score was .81 ($p < .01$) and .65 ($p < .01$) for the analysts and psychologists, respectively, providing strong evidence of construct validity.

Mairesse et al. (2007) assessed the binary classification accuracy of their algorithms by considering how accurately algorithms classified people high or low on personality traits in the same way as observers' and self-reported measures did. They found that extraversion is the easiest trait to model, with binary classification accuracies as high as 73 percent. We extended these binary classification checks to consider how accurately the algorithm captured extraversion for a population of CEOs. We selected excerpts of about 300 words spoken by CEOs who varied in extraversion scores based on the algorithm. We then asked respondents to classify pairs of CEOs in terms of most and least extravert, and we determined the binary classification accuracy between the algorithm scores and the raters' scores. We first placed this exercise on Amazon Mechanical Turk, which yielded 56 participants providing 519 valid responses, resulting in 68 percent accuracy with the prediction based on the algorithm and a 73 percent interrater agreement.⁹ We then approached analysts and investors, who are more familiar with such texts from conference calls. We received responses from 21 analysts and investors who responded to an e-mail invitation, providing 168 valid responses that yielded 74 percent accuracy with the prediction based on the algorithm, with an 84 percent interrater agreement. We also collected videos and background articles featuring 40 CEOs who varied in extraversion scores based on the algorithm, and we asked master's students who had recently taken a psychology course to classify pairs of CEOs in terms of who was most and least extravert. This yielded 64 percent accuracy with the prediction based on the algorithm, with a 76 percent interrater agreement. These checks provide strong support that the algorithm also works well for a population of CEOs.

Dependent Variables

We used two proxies to measure a firm's likelihood to acquire: M&A propensity and M&A frequency. In line with previous research (e.g., Malmendier and Tate, 2008; Yim, 2013), we measured *M&A propensity* as a binary variable that equals 1 if the firm completed at least one deal in a particular year and 0 otherwise. Also in line with previous research (e.g., Levi, Li, and Zhang, 2014; Gamache et al., 2015), we measured *M&A frequency* as the total number of M&As made by each firm in a given year.

To measure *M&A size*, we first summed the transaction values of all completed M&As made by firm i in year t , and we then standardized the value by

⁸ We considered only those CEOs for whom we were able to obtain at least two scores. We removed responses when analysts indicated they were not familiar with the CEO and when psychologists indicated the material they examined was insufficient to assess extraversion.

⁹ We considered all participants who correctly answered a few simple questions about the meaning of extraversion and took at least five minutes with the survey.

dividing it by firm i 's total assets in year t . We also divided this measure by the number of M&As in the year to estimate the average transaction value of the deals. This gave us a continuous measure of M&A size.

Mediator and Moderators

To measure *CEO's board network size*, we collected information on CEOs' outside board memberships from BoardEx. In each fiscal year, we counted the number of boards on which a CEO served, excluding the focal firm's board. We used this count to run the mediation analysis.

We determined *industry competitiveness* by calculating the reversed Herfindahl–Hirschman index, which is based on the market share of all firms in each industry defined by four-digit Standard Industrial Classification (SIC) codes:

$$\text{Industry competitiveness} = - \sum_{i=1}^N S_i^2$$

where S_i is the market share of firm i in the four-digit SIC industry, and N is the number of firms in the same industry. We calculated market share based on sales data from Computstat. We reversed the measure so that a higher number reflects higher industry competitiveness.

To measure *managerial entrenchment*, we used the *E-index* developed by Bebchuk, Cohen, and Ferrell (2009), which measures the number of anti-takeover provisions in a firm's charter and in the legal code of the state in which a firm is incorporated. The index is developed based on six provisions: (1) staggered board, (2) limits to shareholder amendments of the bylaws, (3) supermajority requirements for charter amendments, (4) supermajority requirements for mergers, (5) golden parachutes, and (6) poison pills. Bebchuk, Cohen, and Ferrell (2009) counted the number of these provisions that the company had in a given year and assigned each firm a score from zero to six. A higher E-index score suggests that it is more difficult to remove management by takeovers, signaling weaker corporate governance and stronger managerial entrenchment.

Control Variables

CEO, firm, industry, and year controls. We controlled for various other personality traits that have been emphasized in previous research. Malmendier and Tate (2008) found overconfident CEOs to be more acquisitive, and we followed their approach to measure *CEO overconfidence* by using CEO stock option exercise data from the ExecuComp database. If a CEO has stock options that are deep in the money—it is highly profitable to exercise the options at the current stock price—but the CEO chooses to hold them, this suggests that the CEO is very optimistic about the company's future and signals CEO overconfidence. Risk-taking CEOs may also be more acquisitive, and in accordance with Cain and McKeon (2016), we measured *CEO risk-taking preference* by identifying CEOs who hold aircraft pilot licenses. We collected pilot-CEO information from the Federal Aviation Administration's Airmen Certification database and used a dummy variable of 1 for a CEO with a pilot

license and 0 otherwise.¹⁰ We followed Chatterjee and Hambrick (2007) in proxying *CEO narcissism* using relative cash pay—the CEO’s cash compensation divided by that of the second-highest-paid executive in the firm—and non-cash pay—the CEO’s non-cash compensation divided by that of the second-highest-paid executive in the firm.¹¹ We also controlled for *CEO regulatory focus* using word lists developed by Gamache et al. (2015). Finally, as extraversion tends to correlate with the other Big Five traits (e.g., Olson, 2005), we also controlled for the other four traits (*emotional stability*, *agreeableness*, *conscientiousness*, and *openness*) to reduce the likelihood of a spurious association.

We controlled for *CEO age*, because younger CEOs acquire more (Yim, 2013), *CEO tenure* (number of years the CEO has worked as a CEO in the focal firm), *CEO ownership* (percentage of issued stocks owned by the CEO), and *CEO gender* (a binary variable that equals 1 if the CEO is male). We obtained two proxies to capture CEO power as it affects CEOs’ influence over organizational behavior (Adams, Almeida, and Ferreira, 2005): *CEO-chairman duality* (a dummy variable that equals 1 if the CEO is also chairman of the board and 0 otherwise) and *founder CEOs* (a dummy variable that equals 1 if the CEO is also the founder of the company and 0 otherwise). Including these CEO controls in our models should ensure that our results are not confounded by other CEO characteristics that may also influence firms’ M&A behavior.

We controlled for a number of firm-level variables: *firm size*, measured as the logarithm of total assets of the firm; *Tobin’s Q* to control for a firm’s investment opportunities; *return on assets* to control for firm performance; *free cash flow to asset ratio* to control for a firm’s internal resources; *long-term debt to asset ratio* to further control for a firm’s risk-taking behavior (Cronqvist, Makhija, and Yonker, 2012); the *number of M&As made by the firm in the past three years* to account for previous M&A experience; and *firm age*, measured from the year the firm was founded—if the founding year was missing, we used the first year the company appeared in the Compustat database as the base year. We also controlled for board characteristics: *board size*, *percentage of independent board members* on the board, and the *percentage of female directors* on the board (Chen, Crossland, and Huang, 2016). Finally, we controlled for industry-level heterogeneity and seasonal variations by including both industry (SIC 4) and year dummy variables.

Correction for endogeneity in CEO selection. It is possible that firms wishing to pursue high growth are more likely to recruit or attract extraverted CEOs, which could lead to a self-selection bias. We followed Chatterjee and Hambrick’s (2007) two-step method to address this concern. First, we estimated a model to test the determinants of CEO extraversion, as shown in table 2. Based on these determinants, we estimated a pooled sample regression model with CEO extraversion as the dependent variable. Following Chatterjee and Hambrick (2007), we used the significant determinants to estimate a predicted value of CEO extraversion; see table 2. We then controlled for this predicted

¹⁰ Available at <https://amsrvs.registry.faa.gov/airmeninquiry/>.

¹¹ To avoid losing too many observations, we included only these two indicators of narcissism in the full sample. As a robustness check, we also included the other three hand-collected narcissism indicators in a subsample analysis. Details about the analysis are discussed in the robustness tests section.

Table 2. Determinants of CEO Extraversion*

Variable	Model 1	Model 2	Model 3
Emotional stability	.360*** (.034)	.339*** (.037)	.348*** (.038)
Agreeable	-.801*** (.048)	-.824*** (.052)	-.835*** (.052)
Conscientious	.597*** (.035)	.601*** (.039)	.593*** (.039)
Openness	-.019 (.035)	-.035 (.039)	-.019 (.039)
CEO age		-.010*** (.002)	-.010*** (.002)
CEO tenure		.000 (.002)	.000 (.003)
CEO ownership		-.000*** (.000)	-.000*** (.000)
CEO duality		-.059** (.028)	-.056** (.028)
CEO founder		-.032 (.045)	-.034 (.046)
CEO gender		.205** (.091)	.157 (.098)
CEO relative cash pay		.025*** (.008)	.026*** (.008)
CEO relative non-cash pay		.007** (.003)	.006* (.003)
CEO pilot license		.086 (.095)	.087 (.096)
CEO overconfidence		.006 (.036)	.000 (.036)
Ivy League graduates		-.048 (.037)	-.044 (.036)
American CEOs		.059* (.033)	.061* (.034)
Firm size			.008 (.011)
Firm performance (ROA)			.294* (.155)
Firm debt			-.003 (.010)
Firm age			-.000 (.000)
Percentage of female directors			-.322** (.157)
Total M&As in the past three years			.024*** (.008)
Board size			-.000 (.001)
Percentage of independent directors			.165** (.079)
Constant	4.391*** (.262)	4.935*** (.329)	4.690*** (.347)
CEO-firm-year observations	13,695	11,000	10,711
Number of firms	1,858	1,655	1,639
R ²	.286	.309	.318

* $p < .10$; ** $p < .05$; *** $p < .01$.

* Robust standard errors are in parentheses. Year and industry fixed effects are included in all models.

value of CEO extraversion in our main regression models to predict firms' M&A behavior. This approach helped to control for the self-selection of extraverted CEOs and reduced the possibility of an endogenous bias.

Correction for sample selection bias. We included only firms for which a CEO personality score was available and therefore had to exclude a number of firms. We followed Heckman's (1979) two-step method to correct for any potential sample selection bias this could have caused. First, we downloaded data from Compustat on all publicly listed U.S. firms between 2002 and 2013. We compared the firm-year observations in our sample with this larger dataset and created a dummy variable that equaled 1 if the firm-year observation from our sample was also present in the larger dataset and 0 otherwise. We then ran a probit model using this binary variable to regress on specific firm characteristics, such as firm size, performance, Tobin's Q, and firm age, and CEO characteristics, including CEO age, tenure, and ownership. We subsequently estimated the probability of each sample observation based on the estimates from the probit model and included this estimate in our main regression models; following the literature, we call this variable the inverse Mills ratio.

Models and Estimation

Model estimations varied with respect to the dependent variables. First, for acquisition propensity, measured as a binary variable, we estimated the following logistic regression model:

$$\Pr\{Y_{it} = 1 | E_{ijt}, X_{it-1}\} = \text{Logit}(\beta_1 + \beta_2 E_{ijt} + \beta_3 X_{it-1})$$

where Y_{it} is the binary variable that measures the acquisition propensity of firm i in year t , E_{ijt} is the extraversion score of CEO j in firm i in year t , and X_{it-1} is a set of control variables for firm i in lagged year $t - 1$. Note that CEO extraversion is a static measure in the ten-year sample period. As a CEO may work for more than one firm during this ten-year period, we only regressed M&A propensity on the extraversion scores of the CEOs in the same M&A year so that the decision can be solely attributed to the focal CEO. We excluded years in which there was a CEO change because it was not possible to accurately determine whether the M&A decision was made by the outgoing or incoming CEO in those years.

Second, for acquisition frequency, which is a count measure, we estimated a Poisson regression model as follows:

$$F_{it} = \text{Poisson}(\beta_1 + \beta_2 E_{ijt} + \beta_3 X_{it-1})$$

where F_{it} is the number of M&As made by firm i in year t , E_{ijt} is the extraversion score of CEO j in firm i in year t , and X_{it-1} is a set of control variables for firm i in lagged year $t - 1$.

Third, for acquisition size, measured as a continuous variable, we ran the following ordinary least squares regression model:

$$S_{it} = \text{OLS}(\beta_1 + \beta_2 E_{ijt} + \beta_3 X_{it-1})$$

where S_{it} is the yearly average of relative total acquisition size to the assets value for firm i in year t , E_{ijt} is the extraversion score of CEO j in firm i in year t , and X_{it-1} is a set of control variables for firm i in lagged year $t - 1$.¹²

RESULTS

Table 3 details the descriptive statistics and correlations. The correlations between CEO extraversion and the three M&A behavior variables are all positive and significant, providing preliminary support for H1a and H1b. Tables 2 and 3 also show that CEO extraversion relates to other variables that have been associated with extraversion in previous personality research: it correlates with conscientiousness, emotional stability, openness, and income, and it correlates negatively with age (Neugarten, 1977; Costa et al., 1986; John and Srivastava, 1999; Judge et al., 1999; Seibert and Kraimer, 2001; Grav et al., 2012). Moreover, although gender differences tend to be small for extraversion scores in general, women usually score higher on affiliative facets and men score higher on agentic facets (Feingold, 1994; Helgeson and Fritz, 1999; Costa, Terracciano, and McCrae, 2001; Weisberg, DeYoung, and Hirsh, 2011). CEO extraversion is higher for men than for women, providing some evidence that agentic rather than affiliative features are more important for CEOs (cf. Do and Minbashian, 2014).

Table 4 shows the results for the direct effect of CEO extraversion on the three dependent variables. The regression coefficients of the control variables reveal that firms with more internal resources (*cash flow*) and M&A experience tend to acquire more. The results also confirm prior research—CEOs with stronger promotion focus acquire more (Gamache et al., 2015), and firms with higher female board representation acquire less (Chen, Crossland and Huang, 2016). In support of H1a and H1b, the models show that CEO extraversion is positively related to a firm's propensity to make M&As, frequency of M&As, and size of M&As.

Table 5 presents the mediating role of CEO board network size. Following Baron and Kenny (1986) and De Jong and Elfring (2010), we estimated three stages of separate regression equations. In the first stage (models 1, 2, and 3), we regressed firms' M&A behavior on CEO extraversion and the control variables, thus confirming the direct effect of CEO extraversion on M&A behavior. In the second stage, we regressed CEO board network size on CEO extraversion, and the results (model 4) show that CEO extraversion has a significant, positive relationship with CEO board network size. Next, we regressed M&A behavior on CEO board network size. Models 5, 6, and 7 show that CEO board network size has a positive and significant relationship with M&A behavior: propensity, frequency, and size. Finally, we regressed M&A behavior on CEO extraversion, CEO board network size, and the control variables, and models 8, 9, and 10 show that the significant and positive relationships between CEO extraversion and M&A behavior that we found in models 1, 2, and 3 are reduced for M&A propensity, frequency, and size. We also ran a Sobel test to determine the significance of the mediated effect in accordance with Preacher

¹² Our results remain the same when using the total transaction value divided by total asset value in each firm-year. In all models, we ran a pooled regression with standard errors clustered by CEO-firm observations.

Table 3. Sample Descriptive Statistics and Correlation

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. M&A propensity	.10	.30															
2. M&A frequency	.11	.36	.92														
3. M&A size	.75	1.61	.81	.73													
4. Extraversion	6.44	.69	.06	.05	.05												
5. Emotional stability	3.07	.54	.04	.04	.05	.14											
6. Agreeable	3.31	.37	-.02	-.01	-.01	-.16	.24										
7. Conscientious	6.31	.66	-.02	-.01	.00	.25	-.16	.43									
8. Openness	6.03	.64	-.03	-.01	-.02	.11	-.30	.33	.74								
9. CEO outside board network	.69	.83	.05	.06	.04	.07	.03	.00	-.01	-.08							
10. Industry competition	-.23	.16	.00	.01	.01	-.07	.02	.04	-.05	-.08	-.06						
11. Managerial entrenchment index	2.56	1.22	.03	.04	.01	.02	-.02	.06	.07	.07	.06	.02					
12. Firm size	8.20	1.66	-.03	-.02	-.05	.03	.10	-.04	-.09	-.18	.17	.05	-.02				
13. Tobin's Q	1.67	.67	-.04	-.05	.07	-.02	-.04	.07	.06	.04	-.03	-.07	-.11	-.26			
14. Cash flow	.93	1.91	.02	.03	.03	-.02	-.03	-.03	-.04	-.03	-.04	.06	-.09	.05	.18		
15. Firm performance (ROA)	.09	.07	-.04	-.04	.05	.05	-.02	.02	.02	.00	.04	-.10	-.05	-.06	.59	.29	
16. Firm debt	.66	1.02	-.02	-.02	-.06	-.02	.05	.01	-.05	-.03	.03	-.05	.01	.22	-.19	-.12	-.13
17. Firm age	30.27	17.88	-.03	-.02	-.07	.02	.05	-.04	.00	-.01	.16	-.11	.08	.39	-.25	-.12	-.03
18. CEO age	56.21	6.23	.00	.02	-.03	-.04	-.04	-.07	.00	-.06	.17	-.06	.01	.09	-.14	-.02	-.01
19. CEO tenure	8.54	7.10	.00	.01	-.02	-.01	-.03	-.03	.02	-.03	.02	.03	-.11	-.13	.01	.02	-.03
20. CEO ownership	.14	.43	-.02	-.01	-.02	-.07	-.06	.01	.02	.04	-.10	.00	-.16	-.17	.07	.05	-.03
21. CEO duality	.72	.45	.00	.00	-.02	-.03	-.03	-.08	-.03	-.08	.09	-.04	.06	.21	-.03	-.01	.05
22. Percentage of female directors	.11	.09	-.05	-.05	-.05	-.02	.02	-.08	-.03	-.03	.09	-.02	.07	.26	-.06	-.02	.03
23. Total M&As in last three years	.87	1.54	.20	.22	.29	.08	.05	-.01	.03	-.01	.06	-.02	.01	.05	.08	.01	.06
24. Board size	12.91	9.94	-.03	-.03	.00	-.03	.03	-.02	-.04	-.05	.07	.02	-.01	.31	.09	.05	.04
25. Independent directors	.70	.20	.01	.01	-.03	.09	.02	.04	.03	.04	.02	-.04	.10	-.10	-.22	-.05	-.09
26. Founder CEOs	.16	.37	.00	.00	.02	-.02	.05	.13	.06	.02	-.12	.02	-.13	-.18	.10	.04	-.01
27. Male CEOs	.98	.14	.01	.01	.02	.02	-.01	.06	.02	.00	-.05	.03	.10	.06	.00	-.02	.02
28. CEO pilot license	.03	.18	.00	.00	.00	-.03	-.04	.00	.00	-.01	-.02	.06	-.03	-.03	.00	-.05	.00
29. CEO overconfidence	.36	.48	.02	.02	.03	.06	.00	.00	.07	.02	.04	.01	.01	.05	.10	.05	.11
30. CEO relative cash pay	1.95	.99	.06	.05	.06	.07	-.01	-.01	-.01	.00	.06	-.04	.06	.00	.01	-.01	.05
31. CEO relative non-cash pay	2.66	2.67	.00	.00	-.01	.09	.00	-.05	-.01	.00	.04	-.05	.04	-.02	.01	-.01	.02
32. CEO promotion focus	.01	.00	.02	.01	.02	.03	-.10	-.15	.07	.14	-.02	-.09	.02	-.10	.03	-.03	.04
33. CEO prevention focus	.04	.95	.06	.05	.07	.40	.28	.10	.17	-.01	.11	-.07	-.01	.16	-.02	.07	.02

Variable	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
17. Firm age	.16																
18. CEO age	-.01	.14															
19. CEO tenure	-.06	-.15	.46														
20. CEO ownership	-.05	-.16	.18	.41													
21. CEO duality	.02	.12	.18	.17	.10												
22. Percentage of female directors	.08	.27	-.05	-.18	-.10	.10											
23. Total M&As in last three years	-.05	-.06	.01	.02	-.04	.01	-.04										
24. Board size	.01	.07	-.03	-.07	-.05	.05	.08	.04									
25. Independent directors	.06	.14	.08	-.01	-.11	-.07	.14	-.03	-.64								
26. Founder CEOs	-.08	-.34	-.01	.33	.14	-.02	-.19	.02	-.03	-.08							
27. Male CEOs	.01	-.01	.09	.06	.02	.06	-.30	.04	.02	-.02	.06						
28. CEO pilot license	-.01	-.01	.06	.01	.02	.06	-.01	.00	-.02	.02	-.03	.03					
29. CEO overconfidence	-.05	-.04	.06	.25	.04	.09	.03	.08	.08	-.08	.12	-.03	-.03				
30. CEO relative cash pay	.03	.04	.02	-.04	-.03	.03	.02	.01	.01	-.01	-.05	.01	.00	.03			
31. CEO relative non-cash pay	-.02	.03	.04	.04	.06	.04	.02	-.02	-.03	.06	-.05	-.01	-.02	.03	.09		
32. CEO promotion focus	-.06	.02	-.11	-.13	-.15	-.04	.04	.00	-.03	.05	-.06	-.02	-.07	-.03	.02	-.03	
33. CEO prevention focus	.00	-.01	-.02	-.03	-.09	.00	.01	.11	.03	.04	-.01	.05	-.05	.09	.03	.04	.06

* Correlations > (.03) are significant at $p < .05$.

Table 4. Effect of CEO Extraversion on Firms' M&A Behavior*

Variable	M&A propensity	M&A frequency	M&A size
Extraversion	.155** (.063)	.174*** (.058)	.072** (.029)
Firm size	-.043 (.030)	-.042 (.027)	-.012 (.013)
Tobin's Q	-.527*** (.071)	-.501*** (.062)	-.021 (.036)
Cash flow	.050*** (.014)	.040*** (.013)	.030*** (.009)
Firm performance (ROA)	.095 (.527)	.124 (.479)	.089 (.276)
Firm debt	-.011 (.026)	-.001 (.023)	-.015 (.011)
Firm age	-.009*** (.003)	-.009*** (.003)	-.001 (.001)
CEO age	-.006 (.010)	-.005 (.009)	-.003 (.004)
CEO tenure	-.001 (.008)	.002 (.008)	-.006* (.003)
CEO ownership	-.002 (.001)	-.001 (.001)	-.000*** (.000)
CEO duality	.032 (.081)	.038 (.073)	.019 (.040)
Percentage of female directors	-.677 (.458)	-.737* (.401)	-.355* (.213)
Total M&As in the past three years	.265*** (.024)	.179*** (.020)	.268*** (.017)
CEO pilot license	.018 (.188)	-.033 (.169)	.019 (.095)
CEO overconfidence	.097 (.088)	.050 (.084)	.052 (.045)
CEO relative cash pay (narcissism)	.044 (.033)	.036 (.029)	.024 (.016)
CEO relative non-cash pay (narcissism)	.007 (.014)	.013 (.013)	.004 (.007)
CEO promotion	.059 (.038)	.069** (.034)	.033* (.018)
CEO prevention	.020 (.040)	.030 (.035)	.003 (.020)
Inverse Mills ratio	.604 (.702)	.003 (.729)	.553* (.294)
Control for CEO selection	-.040 (.387)	.128 (.458)	.111 (.181)
Constant	-.825 (2.180)	-1.371 (2.482)	.206 (1.009)
CEO-firm-year observations	10,166	10,166	10,166
Number of firms	1568	1568	1568
R ²	.079	.0768	.101

* $p < .10$; ** $p < .05$; *** $p < .01$.

* Robust standard errors are in parentheses. To ease interpretation of the table, we did not list all control variables here. Additional controls included in the models were emotional stability, agreeableness, conscientiousness, openness, CEO founder, CEO gender, board size, percentage of independent directors, and industry and year fixed effects.

Table 5. Mediating Effect of CEO's Board Network*

Variable	(1) M&A propensity	(2) M&A frequency	(3) M&A size	(4) CEO network	(5) M&A propensity	(6) M&A frequency	(7) M&A size	(8) M&A propensity	(9) M&A frequency	(10) M&A size
Extraversion	.190** (.095)	.234*** (.090)	.093** (.042)	.100** (.041)				.167* (.094)	.196** (.085)	.025 (.041)
CEO board network					.189*** (.061)	.226*** (.057)	.056** (.028)	.179*** (.061)	.213*** (.056)	.055* (.028)
Firm size	-.095* (.049)	-.078* (.043)	-.005 (.021)	.084*** (.023)	-.109** (.049)	-.097** (.042)	-.008 (.020)	-.112** (.049)	-.100** (.042)	-.008 (.020)
Tobin's Q	-.613*** (.121)	-.496*** (.105)	-.089 (.061)	-.016 (.041)	-.623*** (.122)	-.511*** (.107)	-.073 (.058)	-.616*** (.122)	-.503*** (.107)	-.072 (.058)
Cash flow	.045 (.030)	.060** (.026)	.010 (.017)	-.010 (.010)	.047 (.030)	.061** (.026)	.010 (.014)	.047 (.030)	.061** (.026)	.010 (.014)
Firm performance (ROA)	-.825 (.999)	-1.221 (.916)	.300 (.509)	.186 (.292)	-.773 (1.011)	-1.098 (.945)	.196 (.485)	-.839 (1.009)	-1.178 (.937)	.191 (.485)
Firm debt	-.035 (.047)	-.021 (.043)	-.041** (.019)	.017 (.019)	-.043 (.048)	-.029 (.042)	-.036** (.017)	-.041 (.047)	-.028 (.042)	-.036** (.017)
Firm age	-.000 (.005)	-.001 (.004)	-.004* (.002)	.002 (.002)	-.001 (.005)	-.001 (.004)	-.003 (.002)	-.001 (.005)	-.001 (.004)	-.003 (.002)
CEO age	.031 (.019)	.027 (.018)	.009 (.008)	.020*** (.007)	.025 (.019)	.018 (.020)	.008 (.007)	.027 (.020)	.020 (.020)	.009 (.007)
CEO tenure	-.015 (.013)	-.004 (.014)	-.012** (.006)	.012* (.006)	-.018 (.013)	-.009 (.012)	-.013** (.005)	-.017 (.013)	-.008 (.012)	-.013** (.005)
CEO ownership	-.003 (.003)	-.002 (.003)	-.000 (.001)	-.002*** (.001)	-.003 (.003)	-.002 (.003)	-.000 (.001)	-.002 (.003)	-.002 (.003)	-.000 (.001)
CEO duality	.044 (.128)	-.010 (.116)	-.011 (.062)	.050 (.054)	.038 (.127)	-.010 (.114)	-.027 (.060)	.040 (.127)	-.010 (.114)	-.026 (.060)
Percentage of female directors	-.736 (.735)	-.458 (.650)	-.301 (.327)	.318 (.252)	-.990 (.746)	-.776 (.658)	-.242 (.311)	-.867 (.744)	-.609 (.654)	-.230 (.310)
Total M&As in the past three years	.257*** (.031)	.176*** (.025)	.260*** (.021)	.010 (.018)	.257*** (.031)	.178*** (.025)	.261*** (.020)	.255*** (.030)	.176*** (.024)	.261*** (.020)
CEO pilot license	.070 (.251)	.126 (.216)	-.005 (.134)	-.156 (.139)	.094 (.267)	.163 (.236)	-.028 (.117)	.092 (.256)	.158 (.222)	-.027 (.115)
CEO overconfidence	.045 (.124)	-.033 (.117)	.058 (.059)	.010 (.059)	.068 (.123)	.023 (.104)	.065 (.057)	.059 (.122)	.015 (.103)	.064 (.057)
CEO relative cash pay (narcissism)	.136*** (.045)	.109*** (.036)	.073*** (.026)	.018 (.018)	.142*** (.045)	.119*** (.035)	.071*** (.025)	.136*** (.045)	.112*** (.036)	.070*** (.025)
CEO relative non-cash pay (narcissism)	-.007 (.022)	-.006 (.019)	-.009 (.010)	.004 (.007)	-.006 (.021)	-.004 (.018)	-.008 (.010)	-.008 (.022)	-.007 (.018)	-.009 (.010)
CEO promotion	.030 (.059)	.073 (.052)	-.007 (.028)	.019 (.027)	.014 (.058)	.048 (.050)	-.006 (.027)	.023 (.059)	.058 (.050)	-.004 (.027)
CEO prevention	.060 (.060)	.055 (.051)	.026 (.029)	-.012 (.029)	.071 (.060)	.061 (.050)	.024 (.028)	.058 (.061)	.046 (.051)	.022 (.028)
Inverse Mills ratio	2.261 (1.385)	1.076 (1.445)	.739 (.544)	.182 (.352)	2.259 (1.384)	.854 (1.519)	.710 (.518)	2.206 (1.388)	.810 (1.510)	.693 (.520)
Control for CEO selection	.061 (.472)	.086 (.382)	.119 (.275)	-.066 (.162)	.134 (.478)	.181 (.388)	.166 (.246)	.113 (.476)	.165 (.383)	.165 (.246)
Constant	-3.278 (3.098)	-3.519 (2.717)	-.737 (1.531)	-.769 (1.241)	-2.595 (3.072)	-2.294 (2.816)	-.463 (1.390)	-3.300 (3.111)	-3.189 (2.790)	-.566 (1.400)
CEO-firm-year observations	5,035	5,035	5,035	5,035	5,035	5,035	5,035	5,035	5,035	5,035
Number of firms	857	857	857	857	857	857	857	857	857	857
R ²	.104	.102	.126	.170	.105	.105	.121	.106	.107	.121

* $p < .10$; ** $p < .05$; *** $p < .01$.

* Robust standard errors are in parentheses. To ease interpretation of the table, we did not list all control variables here. Additional controls included in the models were emotional stability, agreeableness, conscientiousness, openness, CEO founder, CEO gender, board size, percentage of independent directors, and industry and year fixed effects.

and Hayes (2004). Our results confirm the mediating effect of CEO's board size in the M&A propensity model ($z = 2.615$; $p < .01$), M&A frequency model ($z = 5.463$; $p < .01$), and M&A size model ($z = 2.523$; $p < .05$). The results suggest that CEO board network size partially mediates the relationship between CEO extraversion and M&A likelihood and fully mediates the relationship between CEO extraversion and M&A size, supporting H2a and H2b.

Table 6 shows the moderating effect of industry competitiveness and managerial entrenchment. In support of H3a and H3b, the interaction between CEO extraversion and industry competitiveness has a negative and significant effect on a firm's M&A propensity, frequency, and size. Thus the effect of CEO extraversion on M&A behavior is indeed stronger in less competitive industries. Table 6 also shows support for H4a and H4b. The interactions between CEO extraversion and the managerial entrenchment index on a firm's M&A propensity, frequency, and size are positive and significant, so the effect of CEO extraversion on M&A behavior increases with greater managerial entrenchment.

CEOs' Extraversion and Shareholders' Reactions

To analyze the effect of CEO extraversion on shareholders' reactions following M&As, we followed previous research on M&A performance (e.g., Halebian and Finkelstein, 1999; Uhlenbruck, Hitt, and Semadeni, 2006) that relied on short-term stock market reactions to M&A announcements. We collected the daily stock price of each acquirer in the sample around the deal announcement period from the CRSP database, and we collected the corresponding stock market index for the same period. Similar to Halebian and Finkelstein (1999), we used standard market-adjusted models to calculate daily abnormal stock returns around the M&A announcement date for each acquirer. We calculated these returns as:

$$AR_{j,t} = R_{j,t} - R_{m,t}$$

where $AR_{j,t}$ was the daily abnormal return for firm j on day t , $R_{j,t}$ was firm j 's daily stock return on day t , and $R_{m,t}$ represented the daily return of the local stock market index on day t . We then added daily abnormal returns to measure the cumulative abnormal return (CAR) for acquirer j . In line with other studies (e.g., Fuller, Netter, and Stegemoller, 2002; Masulis, Wang, and Xie, 2009; Gaur, Malhotra, and Zhu, 2013), we used the five-day period (-2, +2 days) around the M&A announcement to calculate the CAR:

$$CAR_j = \sum_{t=-2}^{+2} AR_{j,t}$$

A positive CAR suggests that investors believe that the deal will create shareholder value, while a negative CAR suggests the deal will destroy shareholder value. We regressed the CAR value of each deal on CEO extraversion score and the other control variables, and we also included several other important deal characteristics that usually affect M&A short-term performance: payment method (cash vs. stock payment), tender offers, private vs. public target firms, industry relatedness of the acquiring and target firms, and deal value relative to the acquirer's size. As table 7 shows, we found a positive relationship between CEO extraversion and CAR.

Table 6. Moderating Effect of Industry Competitiveness and Managerial Entrenchment*

Variable	(1) M&A propensity	(2) M&A frequency	(3) M&A size	(4) M&A propensity	(5) M&A frequency	(6) M&A size
Industry competition × Extraversion	-1.267*** (.408)	-1.185*** (.364)	-.417*** (.147)			
Entrenchment index × Extraversion				.699*** (.167)	.326*** (.096)	.244*** (.063)
Industry competition	8.868*** (2.687)	8.611*** (2.440)	2.930*** (.936)	.477 (.354)	.480* (.247)	.222 (.141)
Entrenchment index	.189* (.113)	.167* (.096)	.065 (.050)	-4.479*** (1.115)	-2.121*** (.648)	-1.533*** (.396)
Extraversion	-.145 (.121)	-.086 (.104)	-.045 (.048)	.001 (.083)	.039 (.054)	.003 (.035)
Firm size	-.053 (.037)	-.056* (.033)	-.007 (.016)	-.046 (.037)	.097*** (.025)	-.006 (.016)
Tobin's Q	-.593*** (.094)	-.523*** (.081)	-.043 (.043)	-.602*** (.095)	-.093 (.063)	-.046 (.043)
Cash flow	.062*** (.021)	.059*** (.018)	.018 (.011)	.062*** (.021)	.019 (.015)	.018 (.011)
Firm performance (ROA)	-.388 (.782)	-.570 (.696)	.183 (.351)	-.232 (.792)	.748 (.563)	.230 (.352)
Firm debt	-.024 (.038)	-.015 (.033)	-.031** (.012)	-.023 (.037)	-.074*** (.027)	-.030** (.012)
Firm age	-.003 (.004)	-.004 (.003)	-.002 (.002)	-.004 (.004)	-.002 (.002)	-.003 (.002)
CEO age	.008 (.013)	.004 (.012)	.003 (.005)	.010 (.013)	.003 (.008)	.003 (.005)
CEO tenure	-.005 (.010)	.001 (.010)	-.006* (.004)	-.007 (.010)	-.009 (.007)	-.007* (.004)
CEO ownership	-.004 (.003)	-.003 (.003)	-.001 (.001)	-.004 (.003)	-.002 (.001)	-.001 (.001)
CEO duality	.053 (.099)	.043 (.090)	.030 (.045)	.042 (.099)	.040 (.063)	.024 (.045)
Percentage of female directors	-1.201** (.591)	-.986* (.520)	-.405 (.251)	-1.079* (.589)	-.539 (.372)	-.366 (.250)
Total M&As in the past three years	.238*** (.028)	.166*** (.021)	.245*** (.018)	.236*** (.028)	.182*** (.019)	.245*** (.018)
CEO pilot license	.053 (.250)	.021 (.220)	-.005 (.104)	.017 (.245)	-.070 (.137)	-.018 (.101)
CEO overconfidence	.066 (.105)	.017 (.097)	.043 (.049)	.082 (.105)	-.024 (.067)	.051 (.049)
CEO relative cash pay (narcissism)	.096*** (.037)	.079** (.032)	.045** (.019)	.100*** (.037)	.046** (.021)	.046** (.019)
CEO relative non-cash pay (narcissism)	-.013 (.017)	-.003 (.015)	-.008 (.007)	-.007 (.017)	-.000 (.011)	-.006 (.007)
CEO promotion	.059 (.046)	.083** (.041)	.029 (.021)	.064 (.045)	.037 (.031)	.029 (.021)
CEO prevention	.011 (.046)	.028 (.039)	-.006 (.021)	.011 (.046)	.036 (.031)	-.003 (.021)
Inverse Mills ratio	1.176 (1.021)	.170 (1.012)	.513 (.385)	1.247 (1.019)	-.114 (.629)	.504 (.381)
Control for CEO selection	.452 (.420)	.507 (.354)	.367* (.200)	.395 (.419)	.754*** (.286)	.345* (.202)
Constant	-1.712 (2.619)	-1.582 (2.308)	-.464 (1.148)	-2.608 (2.556)	-5.175*** (1.697)	-.654 (1.150)
CEO-firm-year observations	7,333	7,333	7,333	7,333	7,333	7,333
Number of firms	1105	1105	1105	1105	1105	1105
R ²	.098	.096	.120	.100	.136	.121

* $p < .10$; ** $p < .05$; *** $p < .01$.

* Robust standard errors are in parentheses. To ease interpretation of the table, we did not list all control variables here. Additional controls included in the models were emotional stability, agreeableness, conscientiousness, openness, CEO founder, CEO gender, board size, percentage of independent directors, and industry and year fixed effects.

Table 7. Effect of CEO Extraversion on Cumulative Abnormal Return*

Variable	Model 1	Model 2
Extraversion		.003** (.001)
Firm size	-.003*** (.001)	-.004*** (.001)
Tobin's Q	.001 (.002)	.001 (.002)
Cash flow	.000 (.000)	.000 (.000)
Firm performance (ROA)	-.007 (.017)	-.008 (.017)
Firm debt	.001 (.001)	.001 (.001)
Firm age	-.000 (.000)	-.000 (.000)
CEO age	.000 (.000)	.000 (.000)
CEO tenure	.000 (.000)	.000 (.000)
CEO ownership	-.000 (.000)	-.000 (.000)
CEO duality	.002 (.002)	.002 (.002)
Percentage of female directors	-.009 (.009)	-.009 (.009)
CEO pay slice	-.004 (.008)	-.003 (.008)
Past M&A experience	.000 (.000)	.000 (.000)
CEO pilot license	-.005 (.004)	-.005 (.004)
CEO overconfidence	.000 (.002)	.000 (.002)
Cash payment	.003* (.002)	.003* (.002)
Tender offer	-.001 (.004)	-.001 (.004)
Private targets	-.003* (.002)	-.003* (.002)
Industry relatedness	.002 (.002)	.002 (.002)
Deal size (relative to firm size)	-.000 (.004)	-.001 (.004)
CEO promotion	.002* (.001)	.001 (.001)
CEO prevention	-.001 (.001)	-.001 (.001)
CEO relative cash pay (narcissism)	.000 (.001)	.000 (.001)
CEO relative non-cash pay (narcissism)	-.000 (.000)	-.000 (.000)
Constant	-.004 (.016)	-.015 (.023)
Deal observations	3,464	3,464
R ²	0.059	0.061

• $p < .10$; ** $p < .05$; *** $p < .01$.

* Robust standard errors are in parentheses. To ease interpretation of the table, we did not list all control variables here. Additional controls included in the models were emotional stability, agreeableness, conscientiousness, openness, CEO founder, CEO gender, board size, percentage of independent directors, and industry and year fixed effects.

Robustness Tests

The control variables in our models help to rule out several alternative explanations for our results. For example, we ruled out the possibility that the relationship between CEO extraversion and firm M&A behavior is driven by other CEO personality traits and characteristics examined previously. We also carried out several additional tests to confirm the robustness of our results. In the existing models, we partially controlled for CEO narcissism by including relative cash pay and non-cash pay. For a subsample of S&P 100 firms, we further hand-collected the remaining three indicators of CEO narcissism: the prominence of the CEO's photograph in the company's annual report, the CEO's prominence in the company's press releases, and the CEO's use of first-person singular pronouns in interviews (Chatterjee and Hambrick, 2007). We calculated the composite measure of CEO narcissism based on the five indicators and controlled it in the models of M&A behavior. We included the significant control variables in the models in addition to the Big Five personality measures. The relationships between CEO extraversion and the three outcomes remain significant and positive.

We also used two alternative measures of risk-taking behavior. First, we used a standardized return on assets (ROA) ratio in the firm's sample period (e.g., John, Litov, and Yeung, 2008). Second, Malmendier and colleagues found that individuals who grew up during the Great Depression tend to take less risk in their investment decisions (Malmendier and Nagel, 2011) and to follow less risky corporate strategies (Malmendier, Tate, and Yan, 2011), so we used a dummy variable to identify CEOs who were born between 1920 and 1929. We included these variables in the main effect models and continued to find significant effects of CEO extraversion on firm M&A behavior, suggesting that CEO risk-taking behavior did not influence our results.

There may be a concern that the value of the dependent variable varies by year while the CEO personality measure is constant over the entire sampling period. To ensure that our results were robust for a cross-sectional analysis involving the entire sampling period, we collapsed the yearly measure and summed all M&As completed between 2002 and 2013 by each acquiring firm. We removed observations of firms that experienced a CEO change during the sampling period. In other words, we tracked the number of M&As made by the same CEO in each firm for the same number of years. We used the firm-level control variable values at the beginning of the sampling period (John, Litov, and Yeung, 2008). Again, we continued to find a significant and positive relationship between CEO extraversion and M&A behavior over the entire sample period. Finally, we also re-ran our models with two split-period measures of CEO extraversion (2002–2007 and 2008–2012); our results remained robust.

DISCUSSION

We sought to understand and examine the role of CEOs' extraversion in explaining firms' M&A behavior, and our findings—after controlling for a large number of personality traits and other CEO characteristics—provide compelling evidence that CEO extraversion matters. Extraverted CEOs are more likely to engage in M&As, do so more frequently, and also conduct larger M&As than less extraverted CEOs. The effect is substantial and economically significant.

An increase in CEO extraversion from one standard deviation below the mean to one standard deviation above the mean increases the odds of making an M&A by 11.2 percent per year, increases the frequency of M&As by 13 percent per year, and increases the size of M&As by 6.7 percent per year.

We argued that extraverted CEOs acquire more because they are inclined to seek and enjoy large-scale growth opportunities, spot acquisitive growth opportunities and view them more positively, and transform these opportunities into collective action. An important mechanism through which these effects materialize is the tendency for extraverts to have larger instrumental networks (Fang et al., 2015), have a stronger desire to be differentiated members of these networks, and use them more actively than other CEOs do (e.g., Costa and McCrae, 1985; Forret and Dougherty, 2001). We found strong support that this instrumental network role explains the relationship between CEOs' extraversion and M&A behavior. Extraverted CEOs are more likely to have larger board networks, which partially explains the likelihood of acquiring and fully explains the likelihood of making larger, more consequential M&As.

Strategic management scholars have increasingly stressed the role of CEO personality, but scant research has investigated when it matters. Building on rich personality research in the psychology literature, we considered whether the influence of personality depends on the extent to which situations constrain people from acting according to their own preferences (Mischel, 1977a, 1977b; Barrick and Mount, 1993). We found that situational strength indeed plays an important role in whether CEO extraversion explains M&A behavior. In highly competitive industries, in which M&A behavior is the norm rather than a preference, the situation, rather than personality, seems to dictate M&A behavior. In contrast, in weakly competitive industries, CEO personality explains much more of firms' M&A behavior. We also found that the more CEOs are unfettered by corporate governance rules and processes, as expressed by higher managerial entrenchment scores, the more CEOs' personalities are likely to affect M&A behavior.

The role of situational strength adds nuance to the claim that top executives influence organizational outcomes (Hambrick and Quigley, 2014; Quigley and Hambrick, 2015). Upper echelon scholars view the firm as a reflection of its top management and emphasize the influence of the implied or explicit preferences of CEOs and their immediate associates. At least in the case of CEO extraversion, the extent to which the firm becomes a reflection of its CEO's personality depends on whether the firm happens to be in a weak situation. Scholars advocating a population ecology or institutional view tend to view executives as being constrained by conventions and norms set by external forces that determine how their firms evolve and adapt (e.g., Hannan and Freeman, 1977; Di-Maggio and Powell, 1983). Our study suggests that this may also be the case but only in strong situations.

Finally, we found that shareholders generally react more positively to announcements of M&As that are made by extraverted CEOs. A one-standard-deviation increase in CEO extraversion increases the abnormal stock returns upon M&A announcements by .2 percent, which translates to a \$14.7 million gain for the shareholders of an average acquirer in our sample. Positive reactions may stem from extraverted CEOs' ability to identify and complete higher-quality M&As through their more extensive board networks or from their ability to convince shareholders of the value that they can reap through M&As. This

finding is revealing, particularly considering that shareholders tend to suffer losses following M&As (Agrawal and Mandelker, 1992; Moeller, Schlingemann, and Stulz, 2005). Moreover, this finding places CEOs' extraversion in stark contrast with other personality traits that have been considered before: CEOs' hubris leads to higher M&A premiums, which negatively influence shareholders' reactions (Hayward and Hambrick, 1997), and CEOs' narcissism leads to irregular performance (Chatterjee and Hambrick, 2007) and, in combination with social praise, leads to higher M&A premiums (Chatterjee and Hambrick, 2011). Our finding addresses the performance implications of CEOs' regulatory focus. Given the significant relationship between extraversion and promotion focus (Gorman et al., 2012), the positive shareholder reactions to M&As undertaken by extraverted CEOs may in part be explained by their promotion focus. Although in the control model CEO promotion focus is positively related to cumulative abnormal returns, the significance disappears when adding CEO extraversion.

In this study, we examined the role of CEOs' extraversion using powerful linguistics software. Computational linguistics is a rapidly developing field, and techniques used to recognize personality traits from texts are improving continuously. The method developed by Mairesse et al. (2007) is currently considered to be the state-of-the-art (Celli and Rossi, 2015). Though it is new to management research, computational linguistics is being used in an increasingly wide range of textual contexts such as Twitter conversations (Lima and De Castro, 2014; Celli and Rossi, 2015), Facebook posts (He et al., 2014), blogs (e.g., Iacobelli et al., 2011), job application texts (Faliagka et al., 2014), and broadcast news (Alam and Riccardi, 2014). We hope that our study encourages more scholars to adopt these novel methodologies to explore the psychological foundation of strategy that can be very difficult to examine through surveys or remote proxies.

We controlled for self-selection bias by estimating a pooled sample regression model, using CEO extraversion as the dependent variable. This analysis resulted in findings that resonate with extant research on extraversion. For example, in agreement with other studies that used different methodologies, we find that CEO extraversion is related to other personality dimensions (e.g., Herrmann and Nadkarni, 2014). Also, in agreement with findings on a more general population, we find similar effects of the roles of age (e.g., Viken et al., 1994), American nationality (e.g., Cattell and Warburton, 1961), and gender (e.g., Watkins, 1976): the extraverted CEOs in our sample were more likely to be young American males.

Limitations and Future Research

The focus and analysis of our methods have a number of limitations. First, the strength of the CEO extraversion measure depends on the extent to which the linguistic programs and algorithm fit the population of CEOs. Mairesse et al. (2007) developed and tested their method thoroughly and provided strong support for its validity, but they did so with the purpose of assessing the extraversion of a more general population. Although we performed several conclusive validations, the algorithms could be improved further to fit the CEO population if it becomes possible to tap into other sources of CEO extraversion (e.g., survey reports) among a wide group of CEOs. Moreover, the measure we used

depends on the appropriateness of the spoken text that is considered. The conference calls we examined seem to be suitable, as scholars have found that it is easier to differentiate between more and less extraverted people when texts are spoken during more complex tasks, as anxiety levels are likely to be higher (Dewaele and Furnham, 1999). We used the Q&A section, which we assumed to be unscripted, so that we could be more confident that we coded the CEOs' own words. Yet our findings are limited by the fact that we cannot completely rule out that others may have coached or even scripted possible answers that CEOs gave.

Second, we focused on the personality of CEOs, who arguably play the most central role in firms' strategic decision making. But CEOs generally do not come to these decisions on their own; they rely on top management teams, as well as other internal and external advisors. Therefore it would be interesting to also consider the role of personality traits of CEOs' close associates. For example, the role of CEOs' extraversion might depend on the level of proactivity or extraversion of their direct associates (cf. Grant, Gino, and Hoffman, 2011).

Third, to determine whether the role of CEOs' extraversion influences M&A behavior above and beyond other CEO personality traits and characteristics that have been the focus of previous research, we included a large number of control variables, such as CEO risk taking, power, hubris, narcissism, and regulatory focus, all of which have received recent scholarly attention (e.g., Hayward and Hambrick, 1997; Chatterjee and Hambrick, 2007; Gamache et al., 2015). But still other personality traits may also affect M&A behavior and are extremely difficult to assess for the large sample of CEOs we considered. For example, scholars have found that an internal locus of control may be related to risk taking (Miller, de Vries, and Toulouse, 1982) and small firms' performance (Boone, Brabander, and van Witteloostuijn, 1996), and Morrisson (1997) found that extraversion is significantly related to locus of control among a more general population. Future research can examine whether the effects we observe can be explained in part by a CEO's locus of control.

Fourth, we recognize that conference calls may be limited in the extent to which they capture all personality traits and that they may be better suited for recognizing variation in extraversion rather than the other traits. We cannot rule out that other personality traits may be somewhat suppressed under conference call conditions. Future research should further improve the algorithm to examine and validate the extent to which it captures CEOs' extraversion, as well as the other Big Five dimensions. In a similar vein, important progress can be made in training the algorithm so that it not only measures extraversion in general but also can distinguish between agentic and affiliative aspects of extraversion. Fifth, although our results reveal a substantial economic effect of CEOs' extraversion on firms' M&A behavior, and we included a large number of explanatory variables, a large amount of variance still remains unexplained.

Finally, our study finds preliminary evidence that CEOs' extraversion leads to more positive M&A performance, as indicated by positive shareholder reactions. To gain a better understanding of the influence on M&A performance, future research might explore critical mediating mechanisms, such as whether extraverted CEOs are better at motivating stakeholders toward M&As, retaining CEOs of their acquired firms, or uniting organization members across former firm boundaries following post-merger integration. With the continued

development of programming skills and technologies, the field is rife with opportunities to further address whether, why, when, and how CEOs' extraversion matters to firms.

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