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Authors

Bromiley, Philip
Rau, Devaki

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Social, Behavioral, and Cognitive Influences on Upper Echelons During Strategy Process: A Literature Review

Philip Bromiley

University of California, Irvine

Devaki Rau

Northern Illinois University

This study reviews research on the social, behavioral, and cognitive influences on CEOs, top management teams (TMTs), and the CEO-TMT interface during strategic decision making. We identify the key issues examined in this research over the past 10 years and relate developments in the field to previous knowledge in this area. We also attempt to identify what constitutes an established body of knowledge in the field and, therefore, areas that need additional examination. Our review indicates that while there has been an explosion of research on the influence of CEO personality and TMT social processes on strategy process, much remains to be done in terms of examining CEO and TMT cognition, particularly at the level of the CEO-TMT interface.

Keywords: *upper echelons; social; behavioral; cognitive influences; review*

Introduction

Strategy scholars have an enduring concern with strategy process—the mechanisms by which organizations formulate and implement strategy. A significant and growing stream of research in this area focuses on the role of upper echelons of the firm (chief executive officers [CEOs], other senior managers, and top management teams [TMTs]) during strategy process.

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Corresponding author: Philip Bromiley, Merage School of Management, University of California, Irvine, Irvine, CA 92697-3125, USA.

E-mail: bromiley@uci.edu

Sparked by Hambrick and Mason's (1984) seminal article tracing firm strategic decisions back to the characteristics of upper echelon managers making those decisions, upper echelon research has generally focused on how senior managers' characteristics influence firm strategic decisions and performance. Recent research in this area has generated many new theoretical and empirical insights. Our study reviews published research over the past 10 years that has examined how social, behavioral, and cognitive factors associated with CEOs, TMTs, and the CEO-TMT interface influence strategy process, strategic decisions, and firm performance.

Our article contributes to the research on strategy process at the upper echelons of a firm. Following the last published general reviews on strategy process (Hutzschenreuter & Kliendienst, 2006) and upper echelons (Carpenter, Geletkanycz, & Sanders, 2004) in the *Journal of Management*, articles on the intersection of these topics have proliferated; we identified 149 articles published in the major journals in 10 years. Our review presents a comprehensive identification and coverage of these articles identifying key empirical and theoretical developments in the field. We synthesize these developments by identifying common underlying research themes and link these developments to previous knowledge in the area to identify how our understanding has developed over the years. We attempt to identify what constitutes an established body of knowledge and, therefore, areas that need additional examination. The variety of the studies, however, also points to some major empirical and theoretical issues that continue to challenge research in this area. We conclude with a discussion of these issues and suggest some potential solutions.

Identification of the Literature

Recent reviews on strategy process have reviewed the field either broadly (Hutzschenreuter & Kliendienst, 2006) or focused on a specific construct (Kellermanns, Walter, Lechner, & Floyd, 2005), level of analysis (e.g., Menz, 2012), or theoretical perspective (Narayanan, Zane, & Kemmerer, 2011). We review the literature on strategy process at the upper echelons of the firm for relevant articles (i.e., articles dealing with social, behavioral, and cognitive constructs) published in the past 10 years.

We limit our review to high-impact scholarly journals in strategic management, organization behavior, organization theory, human resource management, psychology, and sociology. The journals we searched for articles included *Academy of Management Journal*, *Academy of Management Review*, *Administrative Science Quarterly*, *Decision Science*, *Human Relations*, *Industrial & Labor Relations Review*, *Journal of Applied Psychology*, *Journal of International Business Studies*, *Journal of Management*, *Journal of Management Studies*, *Journal of Organizational Behavior*, *Long Range Planning*, *Management Science*, *Organizational Behavior and Human Decision Processes*, *Organization Science*, *Personnel Psychology*, *Research in Organizational Behavior*, and *Strategic Management Journal*.

We searched the Business Source Complete database from January 2005 to June 2014 for the following terms in the titles, abstracts, or keywords of papers: *Chief Executive Office*, *CEO*, *executive*, *top management team*, *TMT*, *strategy* (or *strategic*) and *process*, *strategy process*, *strategy making*, *strategy formulation*, *strategy formation*, *strategy* (or *strategic*) and *decision making*, *strategic decision*, *strategic planning*, *strategy implementation*, and *strategy realization*. We excluded articles on specific members of the TMT other than the CEO, such as the Chief Strategy Officer, since a recent review addressed these (Menz, 2012). We reviewed the abstracts of the articles for their relevance to our topic. Our screening

generated a list of 149 articles. We collected copies of these articles and used them as a basis for our review. The online supplemental reference list provides a complete list of these articles along with summaries of their content.

The next section defines social, behavioral, and cognitive influences. We then review studies on social/behavioral influences at the CEO, TMT, and CEO-TMT interface levels and follow with studies on cognitive influences at these three levels. Our review attempts to identify the major research questions or relations among core constructs emphasized by the studies, not to summarize individual studies. Following the review sections, we summarize the current state of knowledge in each area, concluding with a discussion of our findings.

Review of the Literature

Defining Social, Behavioral, and Cognitive Influences

We have structured our review around the two major groupings of social/behavioral and cognitive influences on strategy process. Under the *social/behavioral* label, we examine the literature on CEOs, TMTs, and the CEO-TMT interface for elements or constructs that directly or indirectly influence these executives' behaviors and actions and that are either intrinsic to the executives or relate to their interactions with others. Under the *cognitive* label, we examine the literature for elements related to executives' thinking, particularly information processing. Although both social/behavioral and cognitive groupings include psychological concepts, we differentiate between social/behavioral versus cognitive in that the cognitive approach explicitly addresses information processing. For example, stable personality differences and CEO perceptions of TMT benevolence will fall under social/behavioral, but problem framing and perceptions of industry changes will fall under cognitive.

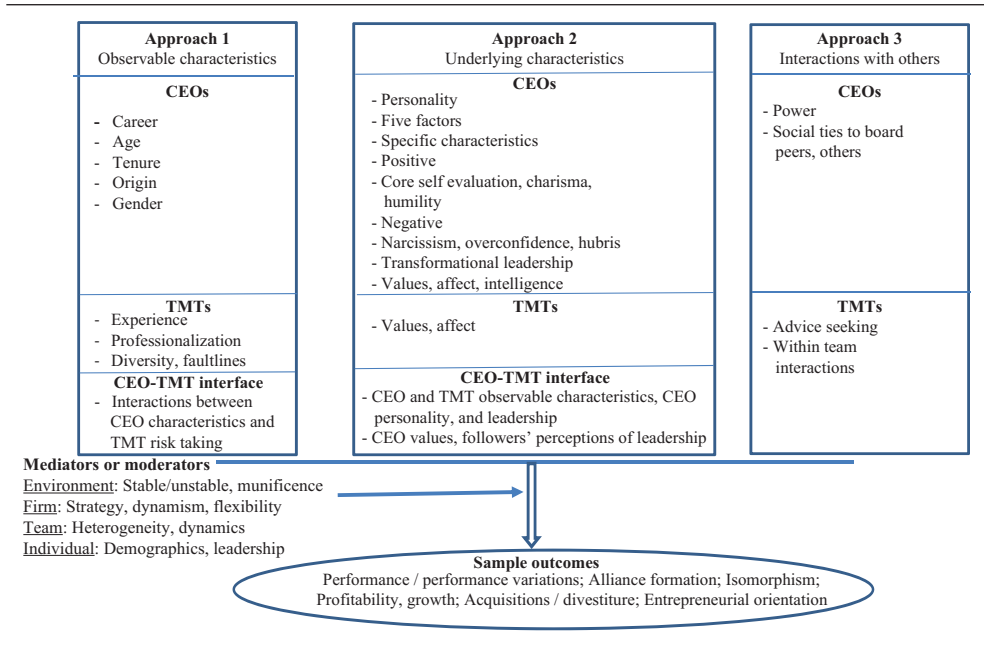
Social/Behavioral Influences on CEOs, TMTs, and the CEO-TMT Interface

Research on social/behavioral influences on CEOs and TMTs has revolved around the question of how senior managers' characteristics influence strategy process and firm outcomes. Over the past 10 years, studies in this area have used three different approaches to examine this question. The top part of Figure 1 graphs these approaches.

Each approach focuses on a different part of Hambrick and Mason's (1984) model. The first set of studies examines how CEOs' and TMTs' observable characteristics or demographics such as tenure, experience, or gender directly or indirectly influence various outcomes, the center of Hambrick and Mason's (1984) model. The second set of studies, corresponding to the psychological characteristics part of Hambrick and Mason's (1984) model, tests whether demographics proxy for underlying psychological characteristics of senior managers affect firm outcomes and examines the effects of constructs like CEO personality, CEO and TMT values, affect, and so on on firm outcomes. The third approach focuses on and extends the group characteristics part of Hambrick and Mason's (1984) model, where it was originally characterized as a type of observable characteristic. This approach argues that both CEOs' and TMTs' observable and underlying characteristics influence CEOs' and TMTs' interactions with others within and outside the firm and thus influence firm outcomes. This research stream clusters around topics that include CEO power, the social ties of the CEO, and TMT interactions.

We examine each type of study in turn. Tables 1, 2, and 3 list the research examining social/behavioral influences on CEOs, TMTs, and the CEO-TMT interface, respectively. The

Figure 1
Social and Behavioral Influences on Chief Executive Officers (CEOs),
Top Management Teams (TMTs), and the CEO-TMT Interface



tables group the studies according to approach and further subgroups them by the key constructs examined within each approach. Online versions of Tables 1, 2, and 3 (Tables S-1, S-2, and S-3, respectively) present detailed information on each of these studies.

Note that while we present these three approaches as distinct, some studies (particularly those examining the CEO-TMT interface or TMT interactions with others) use a combination of approaches to examine the influence of CEO/TMT characteristics on strategy process and firm outcomes. We classify studies according to the dominant approach adopted but note overlaps among approaches as they occur.

Approach 1: CEO and TMT Observable Characteristics

At the CEO Level: CEO Experience, Tenure, Origin, Succession, and Gender

Many studies have examined the effects of CEO experience, broadly defined in terms of CEO career, age, tenure, career horizon (or time to retirement), origin, and succession (see CEO experience, tenure, origin, and succession under Approach 1 in Tables 1 and S-1). Most studies in this area examine the effects of CEO tenure and tenure-related variables on firm outcomes including performance, profitability, growth, divestiture, and strategic change, often mediated or moderated by industry and firm factors and occasionally by CEO or TMT factors such as commitment to status quo (e.g., Henderson, Miller, & Hambrick, 2006).

A few studies have examined gender differences and their performance related effects (see Approach 1: Gender in Tables 1 and S-1). For example, Dixon-Fowler, Ellstrand, and Johnson

(2013) examine media discussions of appointment of male versus female CEOs and the effects of appointment of a female CEO on stock price.

A couple of studies examine the effect of the job itself (e.g., Ganster, 2005; see also Approach 1: Executive job demands in Tables 1 and S-1). The underlying premise of these

Table 1
Social and Behavioral Influences on CEOs

Approach 1: CEO observable characteristics

CEO experience

Crossland, Zyung, Hiller, and Hambrick, 2014
Fern, Cardinal, and O'Neill, 2012
Herrmann and Datta, 2006
Mackey, 2008

Tenure

Henderson, Miller, and Hambrick, 2006
Hayward and Shimizu, 2006
Lewis, Walls, and Dowell, 2014
Luo, Kanuri, and Andrews, 2014
Matta and Beamish, 2008
McClelland, Liang, and Barker, 2010
Souder, Simsek, and Johnson, 2012
Wu, Levitas, and Priem, 2005

Origin

Karaevli, 2007
Karaevli and Zajac, 2013
Zhang and Rajagopalan, 2010

Succession

Cao, Maruping, and Takeuchi, 2006
Chen and Hambrick, 2012
Quigley and Hambrick, 2012

Gender

Dixon-Fowler, Ellstrand, and Johnson, 2013
Smith, Smith, and Verner, 2013

Executive job demands

Ganster, 2005
Hambrick, Finkelstein, and Mooney, 2005a, 2005b

Approach 2: CEO personality and other underlying characteristics

Five factors

Nadkarni and Herrmann, 2010

Narcissism

Chatterjee and Hambrick, 2007, 2011
Peterson, Galvin, and Lange, 2012
Wales, Patel, and Lumpkin, 2013

Overconfidence

Billett and Qian, 2008
Galasso and Simcoe, 2011
Park, Westphal, and Stern, 2011
Pandher and Currie, 2013

Hubris

Li and Tang, 2010

(continued)

Table 1 (Continued)

Core self-evaluations
Hiller and Hambrick, 2005
Simsek, Heavey, and Veiga, 2010
Charisma
Fanelli and Misangyi, 2006
Humility
Morris, Brotheridge, and Urbanski, 2005
Personality and leadership
Americ, Craig, and Tourish, 2007
Ling, Simsek, Lubatkin, and Veiga, 2008a
Peterson, Walumbwa, Byron, and Myrowitz, 2009
Resick, Weingarden, Whitman, and Hiller, 2009
Waldman, Siegel, and Javidan, 2006
Values
Adams, Licht, and Sagiv, 2011
Berson, Oreg, and Dvir, 2008
Boivie, Lange, McDonald, and Westphal, 2011
Chin, Hambrick, and Trevino, 2013
Dahl, Dezso, and Ross, 2012
Ling, Zhao, and Baron, 2007
Ormiston and Wong, 2013
Affect
Delgado-Garcia and De La Fuente-Sabate, 2010
Intelligence
Baum and Bird, 2010
Baum, Bird, and Singh, 2011
Approach 3: CEO characteristics and their interactions with others
Power
Combs, Ketchen, Perryman, and Donahue, 2007
Dowell, Shackell, and Stuart, 2011
Galema, Lensink, and Mersland, 2012
Haynes and Hillman, 2010
Miller, Le Breton-Miller, Minichilli, Corbetta, and Pittino, 2014
Tang, Crossan, and Rowe, 2011
Social ties
Crossland and Hambrick, 2011
Geletkanycz and Boyd, 2011
Li and Qian, 2013
McDonald, Khanna, and Westphal, 2008
McDonald and Westphal, 2010, 2011
Miller, Le Breton-Miller, and Lester, 2011
Nguyen, 2012
Park and Westphal, 2013
Peters and Heusinkveld, 2010
Siegel and Brockner, 2005
Sundaramurthy, Pukthuanthong, and Kor, 2014
Westphal and Bednar, 2008
Westphal, Boivie, and Chng, 2006
Westphal and Deephouse, 2011

Note: Complete references for articles listed in Table 1 appear in the online supplement.

Table 2
Social and Behavioral Influences on Top Management Teams (TMTs)

Approach 1: TMT observable characteristics**TMT experience**

Beckman and Burton, 2008
 Kwee, Van Den Bosch, and Volberda, 2011
 Lee and Park, 2008
 Somaya, Williamson, and Zhang, 2007
 Souitaris, Zerbinati, and Liu, 2012
 Yoo, Reed, Shin, and Lemak, 2009

TMT diversity and faultlines

Barkema and Shvyrkov, 2007
 Bell, Villado, Lukasik, Belau, and Briggs, 2011
 Boeker and Wiltbank, 2005
 Cannella, Park, and Lee, 2008
 Certo, Lester, Dalton, and Dalton, 2006
 Dezso and Ross, 2012
 Kor, 2006
 Minichilli, Corbetta, and MacMillan, 2010
 Nielsen and Nielsen, 2013
 van Knippenberg, Dawson, West, and Homan, 2011

Approach 2: TMT underlying characteristics**Values**

Waldman et al., 2006

Affect

Hmieleski, Cole, and Baron, 2012
 Liu and Maitlis, 2014

Approach 3: TMT characteristics and their interactions with others**TMT advice seeking**

Alexiev, Jansen, Van den Bosch, and Volberda, 2010

TMT interactions

Barrick, Bradley, Kristof-Brown, and Colbert, 2007
 Chen, Lin, and Michel, 2010
 Chen, Liu, and Tjosvold, 2005
 Clark and Soulsby, 2007
 Clark and Maggitti, 2012
 de Wit, Greer, and Jehn, 2012
 Foo, Sin, and Yiong, 2006
 Lin and Shih, 2008
 Lubatkin, Simsek, Ling, and Veiga, 2006
 Qian, Cao, and Takeuchi, 2013
 Raes, Bruch, and De Jong, 2013
 Simsek, Veiga, Lubatkin, and Dino, 2005
 Westphal and Clement, 2008

Note: Complete references for articles listed in Table 2 appear in the online supplement.

studies is that executive job demands (the degree to which an executive experiences his or her job as difficult or challenging) influence executive affect and the types of strategic decisions made by the executive.

Table 3
**Social and Behavioral Influences on the CEO–Top Management
 Team (TMT) Interface**

Approach 1: Observable characteristics

CEO-TMT experience

Simsek, 2007

Approach 2: Underlying characteristics

Personality traits and leadership

Agle, Nagarajan, Sonnenfeld, and Srinivasan, 2006

Colbert, Barrick, and Bradley, 2014

Colbert, Kristof-Brown, Bradley, and Barrick, 2008

Cruz, Gomez-Mejia, and Becerra, 2010

Elenkov, Judge, and Wright, 2005

Hmieleski and Ensley, 2007

Ling, Simsek, Lubatkin, and Veiga, 2008b

Ou, Tsui, Kinicki, Waldman, Xiao, and Song, 2014

Values

de Luque, Washburn, Waldman, and House, 2008

Approach 3: CEO/TMT characteristics and their interactions with others

Arendt, Priem, and Ndofo, 2005

Cao, Simsek, and Zhang, 2010

Chen, Tjosvold, and Liu, 2006

de Jong, Song, and Song, 2013

Note: Complete references for articles listed in Table 3 appear in the online supplement.

At the TMT Level: TMT Experience

Some research on TMT observable characteristics focuses on the effects of TMT experience on various organizational outcomes including performance, time to initial public offering (IPO), number of international alliances, strategic renewal, and the focus of firms' isomorphism efforts (see Approach 1: TMT experience in Tables 2 and S-2). While all of these studies address TMT experience, they measure experience and its outcomes in differing ways. For example, Beckman and Burton (2008) look at the influence of founder experience on start-ups' early decisions and the influence of these decisions on subsequent top manager backgrounds. Souitaris, Zerbinati, and Liu (2012) examine the effects of TMT professionalization on the similarity of new units to their parent companies.

TMT Diversity and Faultlines

Several studies on TMT observable characteristics examine the influence of different kinds of TMT diversity (functional, nationality, demographic, educational, and gender) on organizational outcomes (usually firm performance but also others such as R&D investment intensity and change in the TMT) (see Approach 1: TMT diversity and faultlines in Tables 2 and S-2). While some of these studies examine the direct unmoderated effects of TMT diversity on organizational outcomes, most find TMT diversity's influence on organizational outcomes is mediated or moderated by environmental, firm, and team factors such as

environmental munificence, firm strategy, and TMT tenure (e.g., Nielsen & Nielsen, 2013). Increasingly, studies consider the effects of demographic faultlines (i.e., divisions of the TMT into subgroups) on organizational outcomes (e.g., Barkema & Shvyrkov, 2007; Van Knippenberg, Dawson, West, & Homan, 2011; see Approach 1: TMT diversity and faultlines in Tables 2 and S-2).

CEO-TMT Interface

We found only one study in this category. Simsek (2007), using a sample of about 500 small- and medium-sized enterprises in the United States, examines the influence of CEO tenure on performance through TMT risk-taking propensity and the firm's pursuit of entrepreneurial initiatives (see Approach 1: CEO-TMT experience in Tables 3 and S-3).

Approach 2: CEO and TMT Underlying Characteristics

At the CEO Level

Research on CEO underlying characteristics has focused mainly on CEO personality and its interaction with leadership as well as factors such as CEO values, affect, and intelligence. We begin with research on CEO personality.

CEO Personality

Research on CEO personality traits has grown significantly over the past decade. Several studies examine the direct or indirect (through mediating environmental-, firm-, or individual-level factors such as strategy dynamism, strategic flexibility, entrepreneurial orientation, or servant leadership) influence of CEO personality on firm performance and outcomes such as dynamism, acquisitions, and the firm's entrepreneurial orientation (see Approach 2 in Tables 1 and S-1).

These studies tend to look at CEO personality in one of two ways. A few (e.g., Nadkarni & Herrmann, 2010) examine CEO personality in terms of the five factors that many in psychology claim represent the major dimensions of personality: conscientiousness, emotional stability, agreeableness, extraversion, and openness to experience (Peterson, Smith, Martorana, & Owens, 2003). Many more studies address specific dimensions of CEO personality including both positive (e.g., core self-evaluation, charisma, humility) and negative (e.g., narcissism, overconfidence, hubris) dimensions (e.g., Chatterjee & Hambrick, 2007; see Approach 2 in Tables 1 and S-1).

CEO Personality and Leadership

In addition to these studies, some studies consider the interaction of CEO personality with transformational leadership (e.g., Resick, Weingarden, Whitman, & Hiller, 2009; see also Approach 2: Personality and leadership in Tables 1 and S-1). Some of these studies overlap with the first approach by including demographic characteristics as moderating factors in their models (e.g., Ling, Simsek, Lubatkin, & Veiga, 2008).

CEO Values, Affect, and Intelligence

Some research examines the effects of CEO values (e.g., collectivism, novelty, self-direction, benevolence, organizational identification, and political liberalism) on firm outcomes such as performance, sales growth, shareholderism, employee wages, and corporate social responsibility. Paralleling studies on positive and negative CEO personality traits, one study examines the influence of CEOs' negative and positive affective traits on firm strategies and performance (Delgado-Garcia & De La Fuente-Sabate, 2010). Two studies by Baum and colleagues examine the relations between different types of intelligence in entrepreneurs in the printing and graphics industry and innovative activity and new venture growth (e.g., Baum & Bird, 2010). Approach 2: Values, affect, and intelligence in Tables 1 and S-1 present a complete list of studies.

At the TMT Level: TMT Values and Affect

We found no research that examines the personality or type of leadership of the TMT. Regarding TMT values, Waldman et al. (2006) examine the role of societal culture values (along with CEO visionary leadership and integrity) in predicting the social responsibility values reported by TMT members across 15 countries (see Approach 2: Values in Tables 2 and S-2).

A couple of studies have begun to examine TMT affect (see Approach 2: Affect in Tables 2 and S-2). Similar to studies at the CEO level, these studies examine the effects of positive affective tone (itself influenced by authentic leadership behavior) or, more generally, emotional dynamics in TMTs on firm strategizing processes and performance.

CEO-TMT Interface: Personality and Leadership

Several papers on social/behavioral influences on the CEO-TMT interface combine the first two approaches (i.e., examine both observable and underlying characteristics of CEOs/TMTs) to study the direct or mediating effects of types of leadership (e.g., strategic, transformational, charismatic, entrepreneurial) or humility on firm and individual outcomes such as corporate entrepreneurship, executive influence, and executive attitudes (see Approach 2: Personality traits and leadership in Tables 3 and S-3). In addition to leadership, these studies typically consider additional factors such as CEO demographic and personality characteristics, TMT heterogeneity, and TMT characteristics such as decentralization, risk taking, and behavioral integration (i.e., whether a TMT engages in mutual and collective interaction). Ou et al. (2014), for example, propose a very complex model where CEO humility leads to CEO empowering behaviors that lead to TMT integration.

Values

Similar to the studies on CEO and TMT values, we found one study on the influence of values on CEO-TMT relations (see Approach 2: Values in Tables 3 and S-3). This study, by De Luque, Washburn, Waldman, and House (2008), uses data on firms from 17 countries to examine the relations between CEOs' values, followers' perceptions of leadership, employees' effort, and firm performance.

Approach 3: CEO and TMT Interactions With Others

At the CEO Level

The social factors that influence decision making by CEOs relate mainly to their power and dominance over others in the organization and to their relations with others within and outside the organization such as boards, corporate elite, and society at large including journalists and politicians (see Approach 3: Power in Tables 1 and S-1).

Studies on CEO power typically examine the influence of CEO power on outcomes such as firm failure, performance extremeness, and variability in performance (e.g., Dowell, Shackell, & Stuart, 2011; Tang, Crossan, & Rowe, 2011; see also Krause, Semadeni, & Cannella, 2014, for a review of CEO duality, a typical measure of CEO power). Other studies assign a moderating role to CEO power, usually on the relations between board characteristics and firm strategy or outcomes (e.g., Combs, Ketchen, Perryman, & Donahue, 2007).

Studies on CEO relations with others highlight the importance of CEO social ties to board members and to others outside the firm (see Approach 3: Social ties in Tables 1 and S-1). These studies examine the beneficial or adverse influence of CEOs' social ties to their boards, peers, or others both on the CEO themselves (e.g., in terms of CEO turnover) and on firm performance (e.g., Nguyen, 2012). Some of these studies measure CEO effectiveness usually through survey items or performance attributions by external entities (e.g., McDonald & Westphal, 2011; Park & Westphal, 2013).

A few studies in this area adopt a somewhat different approach by examining how social factors (e.g., institutional pressures, informal national institutions, and the social contexts of different types of owners) influence other psychology-based factors that then influence CEO decision making (e.g., Crossland & Hambrick, 2011; see also Approach 3: Social ties in Tables 1 and S-1).

At the TMT Level

While some research at the TMT level, like the research on CEO social ties, examines TMT advice seeking, a majority of the research on social influences on TMTs focuses on within-team interactions.

We begin with TMT advice seeking. Very few studies examine this topic (see Approach 3: TMT advice seeking in Tables 2 and S-2). For example, similar to the research on the advice giving or seeking behaviors by CEOs to or from their peers, Alexiev, Jansen, Van den Bosch, and Volberda (2010) examine the influence of internal and external advice seeking by TMTs in a sample of small and medium firms from various industries in the Netherlands.

A much larger number of studies examines within-TMT interactions, mainly communication and cohesion within the TMT. These studies typically use a combination of the three approaches discussed in this article (examining observable characteristics in Approach 1, underlying characteristics in Approach 2, and CEO/TMT characteristics and their interactions with others in Approach 3), for example, examining the relations among diversity, team interactions, and outcomes, and suggest that the outcomes of diverse TMTs depend on various intra-team processes (see Approach 3: TMT interactions in Table 2 and S-2). Other

studies examine conflict within the TMT again sometimes using a combination of approaches (e.g., Qian, Cao, & Takeuchi, 2013). Several studies focus on the antecedents (including CEO and TMT demographics) or outcomes of team behavioral or social integration (e.g., Lubatkin, Simsek, Ling, & Veiga, 2006). These studies generally use surveys of CEOs and TMTs.

In addition, similar to the studies on CEO external social ties (but distinct from other studies on TMT interactions), one study examines reciprocity between top executives of large U.S. companies and security analysts (Westphal & Clement, 2008).

CEO-TMT Interface

Research on the CEO-TMT interface links the second and third approaches by examining the mediating role of interactions within the TMT (or between the TMT and the CEO) on the relations between CEO/TMT social or psychological characteristics and organizational outcomes (see Approach 3 in Tables 3 and S-3). De Jong, Song, and Song (2013), for example, examines the relations among lead founder personality, task conflict, relationship conflict, and new venture performance.

Cognitive Influences on CEOs, TMTs, and the CEO-TMT Interface

Research on cognitive influences on CEOs, TMTs, and their interface assumes that understanding the cognitive underpinning of decisions (their cognitive base in Hambrick and Mason's, 1984, model) will give us insights into CEOs' and TMTs' effects on strategy process and firm performance. This research focuses on the determinants and consequences of a few closely related concepts such as attention, perception, cognition, and information processing. Perception and attention relate to how individuals select information for processing, and cognition relates to how individuals use the information (Anderson, 1990). Some studies combine cognitive influences with some of the social/behavioral influences discussed previously.

In general, research on the cognitive influences on CEOs and TMTs differs in that research on CEOs has focused mostly on issues related to attention, cognition, and to some extent, information processing, while research on TMTs has focused on more specialized constructs related to cognition such as polychronicity, mindsets, cognitive diversity (thus paralleling the research on demographic diversity), information exchange, and integrative complexity, in addition to looking at TMT attention and cognition more generally. Figure 2 provides a roadmap to these studies.

Tables 4, 5, and 6 (with detailed online versions in the form of Tables S-4, S-5, and S-6 respectively) list the research examining cognitive influences on CEOs, TMTs, and the CEO-TMT interface, respectively.

CEO Attention, Perception, Cognition, and Information Processing

Several studies examine the effects of CEO attention, perception, cognition, and information processing (see CEO attention, perception, cognition, and information processing in Tables 4 and S-4). A few of these focus on CEO perceptions and patterns of attention, for example, CEO perceptions of the kinds of culture and structure that result in strategic flexibility and the effects of CEO attention toward an emerging technology and speed of entry into a new product market (e.g., Kaplan, 2008).

Figure 2
Cognitive Influences on CEOs, Top Management Teams (TMTs), and the CEO-TMT Interface

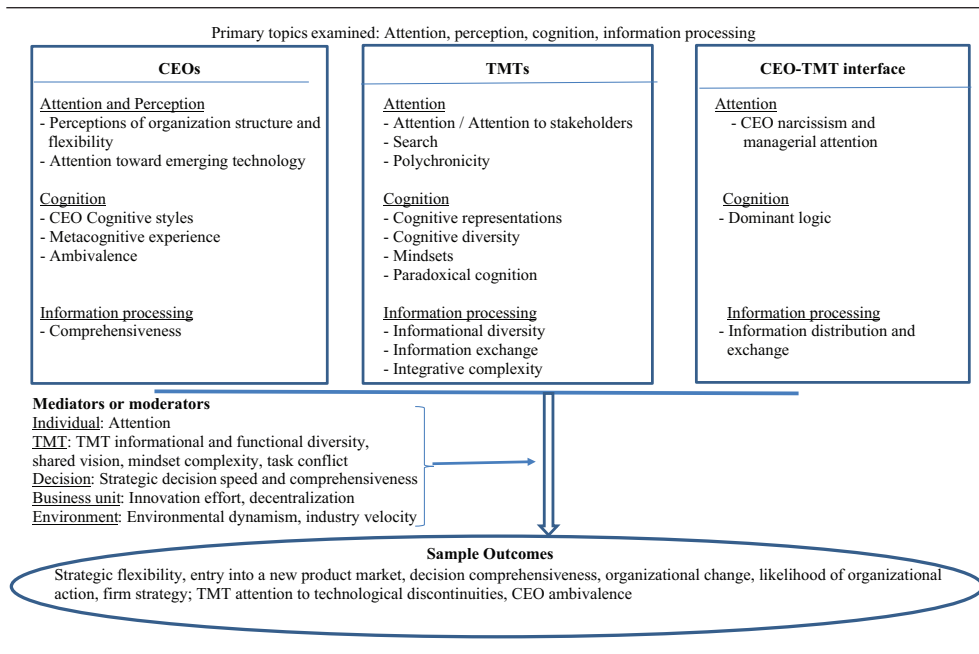


Table 4
Cognitive Influences on CEOs

CEO attention, perception, cognition, and information processing

- Bock, Opsahl, George, and Gann, 2012
- Eggers and Kaplan, 2009
- Heavey, Simsek, Roche, and Kelly, 2009
- Kaplan, 2008
- Mitchell, Shepherd, and Sharfman, 2011
- Plambeck and Weber, 2009, 2010
- Woiceshyn, 2009

Note: Complete references for articles listed in Table 4 appear in the online supplement.

Related to cognition, a couple of studies examine the effects of CEO cognitive styles and metacognitive experience on decision making. Mitchell, Shepherd, and Sharfman (2011), for example, use a field experiment to obtain data on over 2,000 decisions made by 64 CEOs of technology firms in Midwestern United States. The study relates CEO metacognitive experience (the ability to draw on similar experiences to handle difficult tasks) to erratic strategic decisions made by CEOs in different environments. A couple of other studies examine the antecedents and effects of CEO ambivalence on the likelihood and type of organizational responses to external events (e.g., Plambeck & Weber, 2009).

Table 5
Cognitive Influences on Top Management Teams (TMTs)

TMT attention	TMT cognition	TMT information processing
Ackermann and Eden, 2011	Clark, Gioia, Ketchen, and Thomas, 2010	Boone and Hendriks, 2009
Cho and Hambrick, 2006	Nadkarni and Barr, 2008	Hutzschenreuter and Horstkotte, 2013
Levy, 2005	Nadkarni and Perez, 2007	Ling and Kellermanns, 2010
Li, Maggitti, Smith, Tesluk, and Katila, 2013	Olson, Parayitam, and Bao, 2007	Mihalache, Jansen, Van den Bosch, and Volberda, 2012
Maula, Keil, and Zahra, 2012	Smith and Tushman, 2005	Smith, Collins, and Clark, 2005
Souitaris and Maestro, 2010	Wei and Wu, 2013	
Wong, Ormiston, and Tetlock, 2011		

Note: Complete references for articles listed in Table 5 appear in the online supplement.

Table 6
Cognitive Influences on the CEO–Top Management Team (TMT) Interface

Attention, cognition, and information processing

Buyl, Boone, Hendriks, and Matthyssens, 2011
Gerstner, Konig, Enders, and Hambrick, 2013
Kor and Mesko, 2013

Note: Complete references for articles listed in Table 6 appear in the online supplement.

One study, by Heavey, Simsek, Roche, and Kelly (2009), examines CEO information processing. This study uses a survey of CEOs of small- and medium-sized enterprises in Ireland to examine the relations between decision comprehensiveness (the extent to which a firm's decision makers systematically consider information from the external environment in making and integrating strategic decisions in the face of uncertainty) and corporate entrepreneurship, moderated by CEOs' risk-taking propensity. The study not only extends a long line of previous research on comprehensiveness but also combines the study of CEOs' information processing with CEOs' underlying characteristics (Approach 2 in our review of social/behavioral influences).

At the TMT Level: TMT Attention

As with research on CEOs, some research on TMTs examines TMT attention. For example, a couple of studies examine the relations between TMT attention and a global strategic posture or new product introductions. As we noted earlier, however, a number of other studies examine more specific topics related to TMT attention and cognition such as ways to manage TMT attention to critical stakeholders and the effects of TMT search behavior or TMT polychronicity (how the TMT deals with multiple tasks simultaneously) on firm performance (see TMT attention in Tables 5 and S-5).

In addition, studies examining the antecedents of TMT attention often do so in combination with TMT demographics or interactions with others (i.e., Approaches 1 and 3 discussed

earlier) to investigate their influence on firm outcomes. Cho and Hambrick's (2006) study of U.S. airlines, for example, examines the relations among environmental deregulation, shifts in managerial attention, TMT composition, TMT changes, and strategic changes.

TMT Cognition

Mirroring the social/behavioral approach of examining the effects of TMT demographic diversity, cognitive research on TMTs examines the effects of TMT cognitive diversity, cognitive representations, and the complexity of TMTs' cognitive model of the domestic industry (termed *domestic mindset*) on organizational outcomes (see TMT cognition in Tables 5 and S-5). These studies typically examine the joint effects of TMT cognitive diversity or representations with other firm- or industry-level variables such as resource diversity or industry velocity or with team process constructs such as team interdependence and cohesion on outcomes such as speed of response or firm performance (e.g., Wei & Wu, 2013). These studies thus combine the study of cognitive diversity with Approach 3 (examining interactions with others) discussed in the research on social/behavioral influences.

Paralleling the research on CEO ambivalence, one study, by Smith and Tushman (2005), examines the relations between ambiguity and organizational identity. This study uses the idea of paradoxical cognition to develop a model explaining the mechanisms by which TMTs might manage the contradictions of both exploring and exploiting.

TMT Information Processing

While one study that we know of examines TMT informational diversity (Mihalache, Jansen, Van den Bosch, & Volberda, 2012), research on TMT information processing usually combines the study of information exchange within TMTs with demographic factors (e.g., faultlines) and/or social ties or interactions that enable or hinder TMT information processing, thus overlapping with Approaches 1 and 3 in social/behavioral influences that we discussed earlier (see TMT information processing in Tables 5 and S-5). Boone and Hendriks (2009), for instance, examine the effects of collaborative behavior and information exchange among TMT members on outcomes such as firm performance or new product introduction, moderated by different types of TMT diversity.

At the Level of the CEO-TMT Interface: Attention, Cognition, and Information Processing

The scant cognitive research on the CEO-TMT interface combines some of the aforementioned topics and approaches (see Attention, cognition, and information processing in Tables 6 and S-6). For example, in a study of U.S.-based pharmaceutical firms, Gerstner, Konig, Enders, and Hambrick (2013) examine the relations among CEO narcissism and TMT attention to an emerging technology. Related to cognition in particular, Kor and Mesko (2013) argue that CEO influence on TMT dynamics leads to learning and adaptation and eventually to the revitalization of the dominant logic of the firm. However, the theory remains untested. In terms of information processing, Buyl, Boone, Hendriks, and Matthyssens (2011) suggest that CEO demographics influence information exchange and integration within the TMT by moderating the relations between TMT functional diversity (thus overlapping with Approach 1 in the study of social/behavioral influences) and firm performance.

Established Research Findings and Future Research Directions

Social/Behavioral Influences

CEO and TMT Observable Characteristics: What Do We Know?

CEO observable characteristics. Consistent with the upper echelons perspective, CEO experience (in the form of tenure within an organization, industry, or other experiences) clearly influences organizational performance as well as other outcomes including risk taking, invention, strategic novelty, product market choice, and internationalization, depending on contextual factors such as the industry volatility or stability. In addition, consistent with the CEO career seasons hypothesis (Hambrick & Fukutomi, 1991), the impact of CEOs varies over their tenure or their time in office. Henderson et al. (2006), for example, find firm performance positively increases with CEO tenure (up to a limit) in stable industries but declines with tenure in unstable industries. These results are very generalizable; studies have typically been conducted using archival data sources on large samples of firms from a variety of industries.

TMT observable characteristics. Research has just as firmly established that what TMT members bring to the firm—their background, experience, qualifications, and connections— influences a variety of firm outcomes including organizational structures, change, strategy, and performance (e.g., Beckman & Burton, 2008; Souitaris et al., 2012). Indeed, the influence of TMT characteristics on organizational outcomes has been one of the most widely researched areas over the past several decades. Consequently, in the past 10 years, several studies have attempted to encapsulate what we know about different aspects of TMTs through literature reviews or meta-analyses. We begin by briefly discussing the key points expressed in these studies prior to formulating any statement on the current body of knowledge regarding social/behavioral influences on TMTs during strategic decision making.

Carpenter et al.'s (2004) review of upper echelons research called for research into the processes through which demography influences firm outcomes, noting that demography is a coarse measure of underlying constructs. Furthermore, studies measure TMT demographics and heterogeneity in different ways, leading to ambiguous findings.

Following Carpenter et al. (2004), several studies dealt with these issues by incorporating demographic variables along with other measures of TMT processes. Others have conducted meta-analyses of the effects of TMT diversity on firm/group outcomes, albeit with mixed results. Two meta-analyses (on all types of teams, not just TMTs) suggest a direct (Horwitz & Horwitz, 2007), moderated, or mediated (Joshi & Roh, 2009) influence of task-related diversity (but not biographic diversity; Horwitz & Horwitz, 2007) on team performance, in contrast to a previous meta-analysis that finds no influence of job-related and other forms of diversity on group performance (Webber & Donahue, 2001). With respect to TMTs, Bell, Villado, Lukasik, Belau, and Briggs (2011) and Certo, Lester, Dalton, and Dalton (2006) find positive (and some negative; Bell et al., 2011) relations between different types of TMT demographic diversity and team performance. Differences in how the meta-analyses distinguish among the different dimensions of diversity may explain the variability in results (Bell et al., 2011; Harrison & Klein, 2007).

From the previous discussion, as Carpenter et al. (2004) states, TMT diversity matters. Consistent with substantial past research that finds TMT diversity beneficial, studies in the past 10 years find that different types of TMT diversity (functional, educational, nationality,

and gender; the latter two highlighted by Carpenter et al., 2004, as worthy of further study) positively influence a variety of firm outcomes such as firm performance, R&D intensity, and innovation (e.g., Nielsen & Nielsen, 2013).

Some recent research, however, also suggests a more nuanced view of the topic. Some studies find that the positive effects of diversity depend on various environmental-, organizational-, and group-related factors (e.g., Nielsen & Nielsen, 2013). Other studies find that diversity is not an unmixed blessing; it can limit firm outcomes such as change, create faultlines in groups (Barkema & Shvyrkov, 2007; Van Knippenberg et al., 2011), and, as we discuss in the section on TMT interactions, lead to dysfunctional, interpersonal conflict.

Future research directions. While CEO experience, tenure, and age clearly influence firm outcomes, how they influence such outcomes appears complex. For example, CEO tenure appears to have either an inverted U shaped or downward sloping relation with firm performance depending on industry stability (Henderson et al., 2006). The results on succession and CEO origin are likewise complex; the replacement of an incumbent CEO by a new CEO for a firm in a turnaround situation appears to have positive results only if the new CEO has characteristics that match firm conditions (Chen & Hambrick, 2012). Further investigation is merited on the effects of recruiting an outsider for CEO: Different studies find either no effect, an indirect effect, or a moderating role for CEO outsidership. Future research also needs to examine further the influence of context (e.g., Crossland & Hambrick, 2011) and types of demographics such as gender (e.g., Dixon-Fowler, Ellstrand, & Johnson, 2013) on the CEO-firm performance link.

All of these areas of research have an immense potential for practical impact. Most boards treat CEO selection as a critical decision assuming the CEO strongly influences firm performance. To identify what would make a potential CEO a good fit with the firm, research on CEO observable characteristics needs to draw clear connections between CEO characteristics and firm performance. While this requires adherence to the standard prescriptions (e.g., including appropriate control variables and running tests to rule out alternative relations between variables), the research needs to establish whether CEO characteristics such as tenure, gender, or outsidership directly influence firm outcomes or simply enhance or suppress the effects of other factors (e.g., strategy change) on performance. If the CEO effect derives from moderating the influence of other factors, then firms must handle both CEO selection and these other factors in a coordinated manner. What is desirable in a CEO could easily depend on the moderating factors.

At the TMT level, given the vast quantity of prior research linking TMT observable characteristics with firm performance, research in the past decade emphasized how these characteristics influence more immediate outcomes such as firm patenting performance or the formation of international alliances. While these efforts allow a more fine-grained look at firm outcomes that can be directly linked to TMTs, we see some new research directions as more interesting. The study of faultlines, in particular, offers some promising avenues for research. While previous studies tended to suggest that the presence of faultlines in groups is negative, the empirical evidence on this issue is mixed. For example, in a sample of small- and medium-sized U.K. manufacturing firms, Van Knippenberg et al. (2011) find that while gender, tenure, and functional background diversity can lead to faultline influences, only faultlines involving gender influence performance. Moreover, factors such as shared objectives appear to diminish faultlines' negative effects on performance (e.g., Barkema & Shvyrkov, 2007).

Future research needs to establish whether these differences in results reflect different measures and constructs related to TMT diversity, different outcome variables, or the

moderating influence of other factors such as faultlines or type of firm. Research needs to consider the factors that trigger or dissipate faultlines in TMTs. For example, does diversity automatically result in faultlines, or does the emergence of faultlines depend on other factors such as incentives or group processes? How do time together, firm dominant logic, diversification, and other factors influence faultlines? While firms can directly control the composition of a TMT and some of these factors, others like industry are largely predetermined. We need a deeper understanding of the factors generating faultlines and the influence of faultlines on behavior and performance to provide useful insight on how to manage the dynamics of the TMT. Exploring performance differences among firms with different combination of such factors may yield more insightful results than simply examining the performance effects of different types of diversity or faultlines.

Underlying Characteristics of CEOs and TMTs: What Do We Know?

CEO underlying characteristics. Research on CEO personality expanded following Peterson et al.'s (2003) findings that CEO personality influences TMT dynamics. Peterson et al.'s (2003) research, in turn, traces its intellectual roots back to leadership research that attempted to correlate personality characteristics with leadership emergence. Following a couple of influential reviews that concluded that no consistent relations existed between personality and leadership (e.g., Stogdill, 1974), using meta-analysis techniques Judge, Bono, Ilies, and Gerhardt (2002) concluded the opposite, that significant associations exist between each dimension of the five factor model of personality and leadership effectiveness.

Over the past 10 years, upper echelons research has extended the Peterson et al. (2003) and Judge et al. (2002) studies to examine the influence of various aspects of CEO personality on a variety of organizational outcomes. Research in this area has not only established that CEO personality matters (e.g., Nadkarni & Herrmann, 2010) but also that specific dimensions of CEO personality, such as narcissism and core self-evaluation, strongly influence firm and individual outcomes (e.g., Chatterjee & Hambrick, 2007).

In addition, consistent with their origins in leadership research, some studies on upper echelons research at the CEO level have examined and found a link between personality, transformational leadership, and firm outcomes (e.g., Resick et al., 2009). These studies find similar results using two different measures of transformational leadership, raising our confidence in these results. In addition, not all dimensions of transformational leadership appear equally important. One dimension of transformational leadership, charismatic leadership, in particular, seems to not influence firm outcomes such as performance or engaging in corporate social responsibility (e.g., Agle, Nagarajan, Sonnenfeld, & Srinivasan, 2006).

Similar to the findings on narcissism and transformational leadership, research on CEO values finds that CEO values have important consequences for organizations. A range of values such as moral identity symbolization, collectivism, and political ideologies influence a variety of outcomes such as shareholderism and corporate social responsibility, although these influences may vary by level of organization and type of firms (e.g., Ling, Zhao, & Baron, 2007). These studies use data from a variety of industry contexts and countries, use different sources of data (typically survey or archival), and usually employ large sample sizes, increasing our confidence in the importance of CEO values for organizations.

TMT/CEO-TMT interface underlying characteristics. Unlike the studies on CEOs' underlying characteristics, we do not have a vast body of research on TMTs' underlying psychological characteristics or on the characteristics of the CEO-TMT interface. The few studies on this topic, however, point to interesting relations between TMT confidence, emotions, and values on the one hand and strategic decision processes and firm outcomes on the other. CEO leadership appears to play an important role in the CEO-TMT interface, influencing firm- and team-level processes and outcomes either directly or through (or as) an intervening variable (e.g., Agle et al., 2006; De Jong et al., 2013). The influence of CEO characteristics, however, may depend on TMT perceptions; Agle et al. (2006) find CEO charisma is only important to the extent that it influences TMT perceptions of the CEO. Likewise, CEO perceptions of the TMT (and TMT benevolence, in particular) also appear have important consequences for the types of actions taken by the CEO (Cruz, Gomez-Mejia, & Becerra, 2010).

Future research directions. While we know that different dimensions of CEO personality significantly influence organizational outcomes, whether these dimensions have positive or negative effects on organizations needs more examination. With respect to the "dark side" personality dimensions, for example, studies find that narcissism leads to a variety of outcomes such as higher individual risk taking and firm entrepreneurial orientation, lower servant leadership, and extreme and fluctuating organizational performance (e.g., Chatterjee & Hambrick, 2007). That is, personality dimensions generally seen as undesirable can increase some firm behaviors generally perceived as desirable as well as some generally perceived as undesirable. These results, moreover, have been established largely in high-technology industries, albeit with both archival and survey data sources, making them hard to generalize.

With respect to the "bright side" personality dimensions, preliminary evidence indicates that these dimensions influence organizational outcomes through the mediating effect of transformational leadership (e.g., Resick et al., 2009). Other studies examine topics that include the antecedents and consequences of humility; the influence of CEO core self-evaluation and emotion on entrepreneurial orientations, strategy, and performance; the antecedents of CEO attitudes and commitment; and the antecedents and outcomes of intelligence in entrepreneurs (e.g., Baum & Bird, 2010; Delgado-Garcia & De La Fuente-Sabate, 2010).

While these studies provide interesting results and span a variety of firms, industries, and countries, the findings are fragmented. We need more studies on each of these topics before we can identify general relations among these social/behavioral influences and their outcomes.

From a prescriptive standpoint, we need to think deeply about what would constitute useful knowledge about CEO characteristics. Using personality characteristics to select CEOs requires reliable ties between such characteristics and outcomes, but we find seemingly negative personality characteristics can result in positive outcomes. Using personality characteristics to select CEOs requires boards accurately assess such characteristics. Firms do not subject CEO candidates to psychological tests. Instead, boards generally select CEOs based on CEO past experience, reputation, and CEO interviews with board members and the TMT. We lack data on how accurately CEO search committees can assess the personality of candidates. Moreover, should these committees actively seek CEOs with a certain type of personality? Instead, a focus on the candidate's leadership (evidenced by say, his or her track record

with subordinates) may yield better results, especially since transformational leadership appears to mediate the relations between personality and outcomes. Firms may also perform better if they focus not on assessing CEO personality per se but on assessing how the CEO is likely to interact with others in the organization. Park, Westphal, and Stern (2011), for example, indicate that high levels of flattery and opinion conformity heighten CEOs' overconfidence, thereby reducing CEOs' perceptions of the need to change firm strategies in response to poor performance.

This in turn leads to some future research directions for the TMT and more particularly, the CEO-TMT interface. While studies in this area have separately examined CEO and TMT perceptions as well as issues of fit between TMT composition and CEO leadership (e.g., Hmieleski & Ensley, 2007), a promising way of increasing our understanding of top management dynamics and its influence on firm performance may be to examine CEOs' and TMTs' mutual perceptions of "fit" with one another since fit appears to be critical for firm performance.

CEO and TMT Interactions With Others: What Do We Know?

CEO characteristics and interactions. Research in this area, both in the past decade as well as prior to that period, focuses primarily on two topics: the influence of CEO power and the influence of CEO social ties or interactions with entities both within and outside the firm. CEO power has been hypothesized to have either negative (in an agency theory paradigm) or positive (in a stewardship theory or resource dependence theory paradigm) effects (see Krause et al., 2014, for a review). In general, the literature in this area is "rife with conflicting evidence, small effect sizes, and a meta-analysis showing no overall direct and simple relationship" (Krause et al., 2014: 265).

Consistent with this statement, while some recent studies find that high CEO power leads to negative outcomes such as declining or extreme performance (i.e., either big wins or losses; e.g., Tang et al., 2011), other studies find that high CEO power benefits firms in financial distress (Dowell et al., 2011). In addition, too little CEO power may harm firms by leading shareholders to discount a firm's shares (e.g., Combs et al., 2007).

A similar situation exists with respect to CEO social ties, particularly with members of the board (see Boyd, Haynes, & Zona, 2011, for a review) and external entities such as corporate peers or journalists. While empirical results demonstrate these ties have important and often beneficial implications for organizations, recent studies have adopted a more fine-grained approach to understanding exactly how CEO-board relations influence the firm, the CEO, and the CEO's relations with others. For example, in a study of publicly listed French companies, Nguyen (2012) finds CEOs and directors belonging to the same social circles reduces the likelihood the board will oust a CEO for poor performance. Further, socially connected CEOs are more likely to find new and better employment after forced departure. Other studies find corporate governance efforts have unintended influences on CEO social ties, for example, reducing social identification and provision of help by CEOs of other companies (e.g., McDonald & Westphal, 2011). Given the substantial differences across countries in social structures, this is an area in which we should expect substantial international variation. Most of these studies address firms in single countries; hence, their generalizability to other countries remains unclear.

TMT interactions. A number of studies on TMTs over the years have focused specifically on communication and conflict within TMTs. As we noted earlier, these studies find that TMT observable characteristics and particularly TMT diversity lead to task (cognitive) and relation (affective) conflict. While task conflict appears beneficial, the approach used to managing conflict is also critical (Amason, 1996). Some studies over the past 10 years confirm these findings. For example, De Wit, Greer, and Johnson's (2012) meta-analysis indicates that relationship and process conflict negatively and task conflict positively influence TMT performance, especially when performance is measured as decision quality or financial performance.

In this context, the results from Qian et al.'s (2013) study of 122 Chinese high-technology firms are noteworthy. The study finds that when institutional support (the government implementing beneficial policies and programs, providing technology and other support, and helping the firm obtain licenses for import of technology and equipment) is weak, functional diversity results in both cognitive and affective conflict. Cognitive conflict increases innovation in low uncertainty environments, while affective conflict increases innovation in high uncertainty environments. The positive relation between affective conflict and innovation is particularly interesting because it is opposite the received wisdom that affective or interpersonal conflict has negative effects on TMT performance (Amason, 1996).

While few studies have examined behavioral integration (TMT engaging in mutual and collective interaction) in recent years, the research indicates that behavioral integration positively influences firm ambidexterity as well as increasing employee job satisfaction and reducing turnover (e.g., Lubatkin et al., 2006). Social integration and team interdependence both influence team and firm outcomes and performance, although the literature differs on whether those influences are mediated or moderated by other factors or whether social integration and team interdependence mediate the effects of other organizational factors on team or firm outcomes (e.g., Barrick, Bradley, Kristof-Brown, & Colbert, 2007).

CEO-TMT interactions. The few studies that examine this topic hint at relations similar to those observed for CEOs and TMTs, for example, CEO social ties to the TMT increase ambidexterity, and CEO personality influences task and relationship conflict within the TMT, which then positively or negatively influence firm performance, respectively (e.g., De Jong et al., 2013).

Future research directions. As with the research on CEO observable and underlying characteristics, research has established that CEO power and interactions with others are critically important to firm outcomes. More specifically, research on power suggests the most desirable level of CEO power depends on the firm's specific situation and also may depend on the existence of other governance mechanisms such as powerful boards (Tang et al., 2011). Likewise, in terms of CEO interactions with others, we know that CEOs' relations with the board and with external actors such as journalists and politically influential others (e.g., Park & Westphal, 2013) have critical positive and negative effects (some apparently intended and some apparently unintended) on firms.

We see the intersection of research on CEO power and social ties as promising, particularly in the context of what we already know about CEO personality. More specifically,

research on power indicates that people primed for power experience significant changes in their behavior, for example, making them more self-confident, more willing to take risks, and less positively, more self-centered (Galinsky & Schweitzer, 2015). Since appointment as a CEO is a strong “power priming,” this raises the issue of whether such appointment encourages CEOs to be self-centered and take risks. If this phenomenon is indeed real, how should organizations respond? We suggested earlier firms may need to focus on managing how people interact with the CEO rather than on CEO personality per se. We now extend this to suggest that in addition to examining CEO-TMT interactions, research should consider the structural constraints on CEO power (e.g., separating CEO and chair roles, appointing strong directors) to understand the relations among CEO power and personality, CEO-TMT interactions, and firm performance.

In addition, with respect to CEOs’ interactions with external actors, the rules governing the interaction of firm managers with external actors (including stock analysts) have changed recently. The patterns of behavior found in some earlier studies appear illegal under current U.S. legislation. These changes in national laws along with differences in national norms and social structures also suggest a need for careful attention to national differences in these behaviors. Consequently, either replication of studies in other domains or explicitly cross-national studies appear essential.

In terms of TMT interactions, the direct effects of TMT interactions at least in terms of conflict, trust, and integration are well established. However, the effects of these interactions in various institutional contexts may merit study. More importantly, future research could look at the interactions among TMT information processing, demographics, and team interactions; this is a promising area of exploration that we discuss in more detail in the following.

Cognitive Influences

Cognitive Influences on CEOs

Consistent with previous literature (e.g., Thomas, Clark, & Gioia, 1993; also see Narayanan et al., 2011, for a review of a related topic, strategic cognition), recent studies in this area find that cognitive influences on CEOs, whether examined in terms of their perceptions, attention, amount of information processed, or metacognitive experience, significantly influence a variety of firm outcomes including firm performance, flexibility, corporate entrepreneurship, and decision making (e.g., Kaplan, 2008; Mitchell et al., 2011). These studies examine firms in a variety of industries and use multiple techniques such as surveys, archival data, and field experiments, increasing our confidence in the validity and generalizability of the results.

Cognitive Influences on TMTs

Also consistent with previous research (e.g., Kilduff, Angelmar, & Mehra, 2000), recent research finds substantial interactions between cognitive and social/behavioral influences on TMTs. Specifically, to benefit from their demographic diversity, TMTs need to show certain kinds of behaviors and information processing mechanisms, such as collaboration and information exchange (Boone & Hendriks, 2009). Likewise, team processes such as task conflict, trust, or cohesion appear to moderate the relations between TMT cognitive diversity and performance (e.g., Wei & Wu, 2013). It also appears clear, from a number of studies based in different industries and that use different methods of data collection, that TMT demographics

and interactions with others influence one specific aspect of TMT cognition, namely, TMT attention. TMT attention and search patterns in turn directly or indirectly influence a variety of firm strategic outcomes such as firms' strategy changes, global strategic posture, and new product introductions.

Future Research Directions

Overall, we see much scope for the study of cognitive influences on CEOs and TMTs given the current fragmented findings on this topic. For example, future research could examine the relations between CEO cognitive styles and strategic decision making (e.g., Woiceshyn, 2009)—a topic we still know little about. With regard to TMTs in particular, a number of studies examine several interesting topics and present some intriguing results that merit further investigation. These include the moderating effect of TMT informational diversity on the relations between offshoring and innovativeness, the impact of TMT polychronicity on firm performance, the relation between TMT advice seeking and exploratory innovation, the influence of TMT integrative complexity on corporate social performance, and the effect of faultlines on TMT information processing (e.g., Alexiev et al., 2010; Hutzschenreuter & Horstkotte, 2013).

With respect to faultlines in particular, Hutzschenreuter and Horstkotte (2013) find diversity (faultlines) influence TMT cognition (information processing); previous research had not found a relation between demographics and strategic cognition (Narayanan et al., 2011). We see such crossovers (e.g., simultaneously examining social/behavioral influences—using one or more of the approaches we discuss in this article—and cognitive influences, perhaps at multiple levels) as particularly promising for future research. In the previous section, we suggested examining the relations between CEO power and CEO-TMT interactions on the one hand and firm outcomes on the other. Extending this model to examine intermediate effects on CEO and TMT information processing could yield important insights on strategic decision-making processes within firms. Likewise, we suggested previously that future research can examine CEO proclivities for intuitive or analytical decision making. Since the effectiveness of intuition depends on learning or past experience, research could examine the relations among CEO experience or tenure, CEO cognitive style, and decision-making speed and quality. All of these suggestions relate to our earlier discussion of CEO selection: Do CEOs influence firm outcomes because of who they are or because of how they influence others?

These kinds of crossover research studies could also revive some dormant areas of research. For example, while Narayanan et al.'s (2011) review of the cognitive perspective on strategy identifies organizational identity as a proximal predictor of strategic action, very few studies have examined organizational identity in recent years. Given recent trends that have the potential to weaken organizational identity (e.g., an increasing number of firms employing independent contractors rather than employees), scholars may want to examine social/behavioral factors that influence the joint evolution of CEO, TMT, and employee perceptions about what their organization is and how it operates.

Discussion

We began this review expecting to identify a group of key findings that answer the central question in the research on upper echelons: How do senior managers' characteristics and management approaches influence firm strategic decisions and performance?

However, we found such findings hard to identify. On the one hand, the literature has conclusively demonstrated very general, high-level support for Hambrick and Mason's (1984) model finding, for instance, that CEO demographic and experience characteristics, personality, values, leadership behaviors, social ties, attention, perception, and cognition all influence firm behavior and performance. In many cases, parallel research demonstrates similar influences for TMT measures. On the other hand, the field has developed a variety of very specific findings. For example, CEO tenure increases firm performance up to a point in stable industries but decreases performance in unstable industries. Overall, the field as a whole has not coalesced around a coherent set of findings.

We see two reasons for this. First, the field uses a diversity of explanatory constructs and dependent variables. While this multiplicity expands our understanding of the relevant phenomena, it reduces our ability to develop cumulative knowledge. The categories noted in Tables 1 and 2 if anything understate the diversity of approaches and variables in use in the area; many of the categories in these and the other tables contain several related but distinct constructs.

Second, the question underlying upper echelons' research—the relation between senior managers' characteristics and firm strategic decisions and performance—is inherently complex. Studies that demonstrate direct relations between many of the most commonly studied strategy process variables and outcomes probably understate the complexity of the problem; many other studies demonstrate that other factors moderate the influence of managerial variables on behavior and performance. In addition, many of the explanatory variables studied separately in independent studies like kinds of experience, dimensions of personality, and cognitive processes undoubtedly correlate substantially. These interactions and correlations make it likely that studies of any one or two factors that do not include related variables will suffer from omitted variables bias or spurious correlations and present a distorted picture of how CEO and TMT characteristics, management style, and cognition matter for firms. To some extent, the entire field of strategic management scholarship shares this problem—the field has a plethora of explanations of performance, making it difficult to execute studies that control for all of the reasonable alternative explanations.

Our review of the current research probably understates the size of this problem. We have only discussed mediators and moderators already demonstrated to matter. Further research will almost certainly add additional mediators and moderators.

We see several tactics that might ameliorate these problems. First, more studies should use common dependent variables. At a minimum, archival measures of firm performance allow one common kind of dependent variable outcome that many studies might use.

Second, given the diversity of and interactions and correlations among explanatory constructs, researchers may want to control for a greater number of constructs within a given study. While studies increasingly examine interactions among management-related constructs, many still do not. To the extent feasible, strategy process studies should attempt to expand the number of constructs used within a single study, facilitating both appropriate controls for alternative explanations and a deeper understanding of the connections among the different constructs related to strategy process. We have identified many such studies that combine multiple constructs from different approaches to examining the senior managers' characteristics-performance relation.

The third tactic deals with the underlying theory. Part of the diversity in findings derives from upper echelon research's lack of a unifying theory. Hambrick and Mason (1984)

provided a unifying perspective for studying senior managers but not a unifying theory. It opened the field to examining any number of characteristics in any number of settings. While, as we note previously, this has served to develop the field and increase our knowledge of why senior managers matter, it makes it extremely hard to identify a core set of coherent findings.

However, the reality may not fit a single unifying theory. For example, we know personality and incentives matter, but theories of personality do not address incentives, and most theories of incentives ignore personality. Likewise, some factors may be individual-level constructs (e.g., CEO personality), but others may reflect organization- or even industry-level factors. A single unifying theory may not be feasible, but scholars may still want to work toward a smaller set of theories that help frame what is currently a very diverse set of findings. In addition, instead of continually identifying new constructs that might explain CEO and TMT effects on strategy process, scholars might emphasize synthesizing existing constructs, perhaps through macro constructs. Hiller and Hambrick's (2005) construct of core self-evaluation provides one such example.

Fourth, scholars may want to emphasize the context in which CEOs and TMTs make decisions more than identifying new dimensions of CEO personality or TMT characteristics that influence firm performance. For example, we know that CEO personality and TMT diversity influence performance. Given that firms use managerial characteristics to select managers, studies may want to address the organizational and institutional selection factors that determine the characteristics of those who reach the TMT or become CEO. A few studies highlighting the role of institutional and national pressures on CEO and TMT decision making exemplify this trend (e.g., Crossland & Hambrick, 2011; Waldman et al., 2006).

Fifth, researchers need to pay attention to the interconnected structure inherent in these issues. Building on the selection issues described previously, boards choose CEOs for reasons that probably depend on their beliefs about the CEO's ability to increase firm performance. Likewise, the structure of the top management team depends on purposeful choices. Consequently, researchers need to consider such selection or endogeneity issues. The personality and characteristics of the CEO or top managers are not exogenous to the firm's situation.

Some of our recommendations strongly resemble those made by Carpenter et al.'s (2004) review of the upper echelons literature over a decade ago. Carpenter et al. called for a "tremendous need and opportunity for additional investigation into how executive-level variables interact and their combined, cumulative effects on individual and organizational outcomes" (2004: 771) and "the need to simultaneously consider alternative mechanisms and control, to the extent possible, for additional mechanisms associated with executive effects on firm outcomes" (2004: 773).

All of these recommendations inherently require substantial data sets to usefully estimate complex models. Consequently, perhaps the time is right for a definitive study of CEO and TMT characteristics conducted by a consortium of scholars, using a large sample across many firms, with data that include survey measures of multiple constructs. In the management literature, the GLOBE study on organizational culture served to both define and validate a set of national culture factors (Chhokar, Bodbeck, & House, 2007; the Waldman et al., 2006, study we include in this review resulted from the GLOBE study). In the operations management area, work described in Schroeder and Flynn (2001) used an international team

of scholars to develop a large, global data set that included a wide variety of operations management variables on a great many firms. In organizations, work described in Huber and Glick (1993) used multiple investigators to collect a common data set dealing with organizational design issues. Such a data collection effort might be independently underwritten by management scholars or could be a joint effort between management scholars and major organizational consulting organizations (see e.g., Bloom, Genakos, Sadun, & Van Reenen, 2012). Such data might open new vistas and help scholars address the discriminant and nomological validity of measures of managerial characteristics and how non-survey measures relate to survey measures of similar constructs. Such data would also help scholars develop and test comprehensive models of managerial characteristics that recognize selection factors, moderating variables, and mediating variables.

Conclusion

To summarize, an exceedingly active and important set of research on CEOs and top management team has developed a plethora of constructs and empirical findings. While continuing on this course would obviously add to our understanding, scholars may wish to turn to attempting to understand and compare the plethora of constructs, perhaps by finding more parsimonious constructs that have more general and reliable relations with behavior and outcomes.

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