

Strategic Leadership: An Empirical Study of Factors Influencing Leaders' Strategic Thinking

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Researchers suggest individual differences play a significant role in leaders' strategic thinking; however, empirical investigation of this topic is sparse. This study drew from the current leadership literature and assessed whether personality traits and information processing styles influence leaders' strategic thinking. A self-report survey was used to collect data from a random sample of 48 U.S. executives and managers across professions and industries. Multiple regression analysis was used to measure extraversion, agreeableness, conscientiousness, emotional stability, openness to experiences, rational engagement, and experiential ability. The results indicate extraversion and agreeableness, in particular, statistically significantly influence leaders' strategic thinking. This study has practical implications for leadership development and provides a pragmatic framework to identify leaders capable of filling strategic positions across organizations. Finally, further research is recommended to replicate this study and investigate the ways contextual factors may shape this model.

Key Words: Decision-making, information processing, leadership development, personality traits, strategy


Introduction

The past few decades have seen unprecedented shifts in the world economy (Dicken, 2015). Emerging poles of business activities, innovative products, flexible and lean manufacturing systems, and advanced technology of information and communication have redefined the competitive landscape (Cavusgil & Knight, 2015; Doh, McGuire, & Ozaki, 2014; Nakahara, 1997; O'Brien & Williams, 2013). Increasingly, leaders are seeking new skills to overcome unconscious biases, test initial assumptions, and make rational decisions. Responsiveness, creativity, speed, and innovation (Guenzi, De Luca, & Troilo, 2009, 2011; Guenzi & Troilo, 2007) have become the hallmark of creating and sustaining superior advantage. The essential leadership skills, according to Schoemaker, Krupp, and Howland (2013), are those that "allow leaders to think strategically and navigate the unknown effectively: the abilities to anticipate, challenge, interpret, decide, align, and learn" (p. 1). In other words, strategic thinking is essential to effective leadership.

Strategic leadership involves strategic planning and executing of those plans, which requires strategic thinking. Mumford, Zaccaro, Harding, Jacobs, and Fleishman (2000) asserted that effective leaders should be capable of solving complex social problems that arise in organizations, which requires a high level of thinking. More often, leaders spend their energy and

resources in planning strategy, with a minimum of consideration of elusive challenges that can undermine its successful execution. A growing number of reports (Goldman & Casey, 2010; Pisapia, Ellington, Tous-saint, & Morris, 2011; Pisapia, Pang, Hee, Lin, & Morris, 2009; Pisapia, Reyes-Guerra, & Coukos-Semmel, 2005) suggested that strategic thinking marks the difference between effective leaders and noneffective leaders. Strategic thinking is now a sought-after skill by headhunters looking to fill strategic positions. Interestingly, prior researchers suggested that leaders who think strategically display certain personality traits (McClain, 2013) and cognitive skills (Dilchert & Ones, 2009). While goals differ and the plans to achieve them vary, strategic thinking remains a catalyst for strategy success and a core competency that enables leaders to adapt effectively to a complex and ever-changing environment. This study tested a predictive model that can be useful for both private and public organizations.

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Theoretical Considerations

Strategic thinking is a cognitive process that defines an individual's ability to anticipate threats, discern opportunities, examine alternative actions, and make decisions that maximize short-term values and create long-term competitive advantage. Several studies have provided insights into the different ways leaders can stretch their thoughts and adapt to dynamic, complex, and uncertain environments. Four theoretical shifts have occurred over the years, which have put strategic thinking at the forefront of effective leadership. First, the attributes of leadership have evolved and expanded with the recognition that leaders have a unique responsibility to accomplish their organizations' goals (Zaccaro, 1996). This recognition led scholars to investigate the requisite behaviors of effective leaders. Reviewing research of the past half century, Yukl (2012) identified four meta-categories of leadership behaviors: task-oriented behaviors, relation-oriented behaviors, empowering behaviors, and external behaviors. Each category of behavior has been studied widely. So far, no agreement has been reached about universal characteristic traits or behaviors that describe leadership effectiveness (Henman, 2011).

Second, in 1950, the seminal works of Burns, Woodward, Lawrence, and Lorsch led to the contingency theory of leadership (Marchall, 1998). The theory upholds the notion that there is more than one way to lead because organizational tasks and operational environments are different. Also, Fiedler (1964) and Hersey and Blanchard (1969) found that leadership effectiveness depends on multiple factors. Similar to their many predecessors, contingency theorists describe leadership effectiveness in relationship to job performance (Evans, 1970). Although a stream of research has supported this connection, scholars have noted several limitations when this theory is applied to strategic management (Ginsberg & Venkatraman, 1985). Hence, in 1973, Vroom and Yetton developed the normative decision theory, which focuses exclusively on the leader's decision-making process (Seyranian, 2009). Despite its limitations, normative decision theory energized contingency proponents as they began to consider the mindset of an individual as a potential contributor to leadership effectiveness.

Third, strategic leadership emerged in the 1980s as a field that pertains to the way a manager's mental capacity reflects on an organization's ability to adapt to its environment (Phipps & Burbach, 2010). This line of theory marked the beginning of the cognitive approach to leadership effectiveness. According to Jacobs and Jaques (1987), leadership, for the most part, reflects a mental or problem-solving process. Hambrick (1989) wrote, "The study of strategic leadership focuses on the people who have overall responsibility

for the organization" (p. 6). This responsibility includes envisioning (Eacott, 2008), conceptualizing (Davies, 2006; Davies, Davies, & Ellison, 2005), engaging, articulating, implementing, and monitoring (Davies, 2006; Davies et al., 2005; Eacott, 2008). Moreover, Boal and Hooijberg (2001) considered a strategic leader as possessing the absorptive capacity, adaptive capacity, and managerial wisdom. Likewise, Eacott (2010) described strategic leadership as creating a vision for a desirable future, setting the direction, and building the skill to achieve that future.

Fourth, the lack of consensual delineation of the domains of strategic leadership led researchers to adopt divergent and sometimes overlapping points of view (Heracleous, 1998). Some researchers argue that creativity and intuition—and not analyses and rational processes—drive successful strategies (Ohmae, 1982). Others suggest these two approaches are the same because both are driven by analytical and cognitive processes (Zabriskie & Huellmantel, 1991). There are also researchers who believe strategic thinking is a new approach to strategy (Wilson, 1994). While the various perspectives of a strategy's success are legitimate, it is worth noting, as Mintzberg (1987) warned, "The real challenge in crafting strategy lies in detecting the subtle discontinuities that may undermine a business in the future. And for that, there is no technique, no program, just a sharp mind in touch with the situation" (p. 17). For many years, Mintzberg's views have dominated the strategic management literature. Several other views have also provided invaluable insights into the nature of strategic thinking. Two of the most popular are stratified systems theory and human agency.

Stratified systems theory links with strategic thinking. Psychoanalyst Elliot Jaques and his colleagues developed stratified systems theory (SST) in the late 1970s as an attempt to match leadership level with requisite skills in bureaucratic organizations (Meindl, 1994; Skyttner, 2005). They identified two factors of cognitive development: complexity and time span (Jaques & Stamp, 1990). As a result, Zaccaro (2001) argued that as a person moves up the hierarchy, "problem types and decision choices become more ambiguous, less structured, more novel, and more differentiated" (p. 24). Therefore, leaders must match their cognitive skills with the complexity of their roles in order to make appropriate decisions (Jacobs & Jaques, 1987; Jaques & Clement, 1991).

SST suggests that people have a natural capacity to grow intellectually and that their growth occurs in predictable time spans (Skyttner, 2005). The theory distinguishes seven strata in an organization's hierarchy ranging from three months or less to 20 years or more, which determines individuals' perceptions of

where they belong in the hierarchy. Each stratum corresponds to a specific time span and role complexity. For example, the time span of a chief executive officer (CEO) of a major organization might be between 15 and 20 years. As a result, Jaques and his colleagues introduced the concept of *requisite organization* as one in which each level in the hierarchy has its unique time span. Later, Jacobs and Clement (2007) summarized SST time span in three broad categories: less than two years (*operational*), two to ten years (*comprehensive*), and ten years plus (*strategic*). According to this scheme, the strategic behaviors that are expected at the highest level of the organization include, for example, creating and integrating complex systems, crafting policy, and forming organizational resources. These responsibilities are bestowed upon leaders who are at the top level in the organization (Jacobs & Clement, 2007).

SST emphasizes the cognitive ability of people who are already at the top of the hierarchy or who aspire to climb the corporate ladder. Despite its popularity, the domain of cognitive ability is not well investigated within the SST framework, and the results of the few studies that are available are not clear (Jaques & Stamp, 1990). Another theory closely related to SST is Kegan's (1982) constructive development theory. Research in constructive development suggests there are different orders in which the human mind constructs reality, and whenever the meaning and complexity of this reality shift qualitatively, the mind operates at a higher level (Kegan, 1982, 1994; Laske, 2006). This view advocates that as individuals develop and become cognitively mature, they become progressively aware of the assumptions that influence their behaviors (Kegan, 1982, 1994).

Although SST has been successfully applied in large organizations mostly in public administration (e.g., military organizations and government), it has not been fully conceptualized and empirically tested (Meindl, 1994). Nevertheless, SST has substantially improved leadership effectiveness in many organizations (Barton & van den Broek, 2011; Jacobs & Clement, 2007). SST has also shed light on the way organizational structures, processes, and time spans interact to create a path for leadership development. Most important, SST implies that cognitive maturity, complexity, and time span are the drivers of strategic thinking.

Human agency links with strategic thinking.

Human agency derives from social cognitive theory, which describes behaviors as individuals' perceptions of their ability to act (Bandura, 1986, 1997). The concept suggests that thoughts are the results of brain activities that influence people's actions to achieve purposive outcomes (Bandura, 2001). *Human agency* refers to the ability of individuals to make choices, use

their experiences, and influence their circumstances (Bandura, 2000). Early psychologists argued that environmental stimuli shaped human behaviors with no internal control, whereas recent research has recognized the predominant role of human consciousness (Carlson, 1997). Bandura (2001) noted, "A functional consciousness involves purposive accessing and deliberative processing of information for selecting, constructing, regulating, and evaluating courses of action" (p. 3). In this view, strategic thinking is purposeful and deliberate. Furthermore, as a characteristic of an individual's general intelligence, a strategic thinker is someone who is deliberately capable of solving problems (Dilchert & Ones, 2009). Whether strategic thinking is a function of cognitive maturity, complexity, time span, human consciousness, or intelligence, the concept still lacks a universally accepted definition.

Models of Strategic Thinking

Strategic thinking has been discussed widely in the literature, but there is no universally accepted definition (Bonn, 2001). Research shows that strategic thinking is a multifaceted construct of human cognition (Fiske & Taylor, 2013; Mintzberg, 1978; Partlow, Medeiros, & Mumford, 2015; Schwenk, 1988; Stubbart, 1989). Despite the lack of consistency in defining strategic thinking, two frameworks have provided some areas of consensus.

Liedtka's (1998) five-factor model of strategic thinking. Liedtka (1998) reviewed various definitions and concluded that strategic thinking is simply a "particular way of thinking, with specific attributes" (p. 122). She matched strategic thinking with five elements: (a) systems perspective (Moore, 1993; Senge, 1990), (b) intent-focused (Hamel & Prahalad, 1994), (c) intelligent opportunism (Burgelman, 1991), (d) thinking in time (Hamel & Prahalad, 1994; Neustadt & May, 1986), and (e) hypothesis-driven. Although helpful as a general framework, Liedtka's five-factor model of strategic thinking lacks empirical validation. The question of how to conceptually define each element so it can be tested remains unanswered.

Pisapia et al.'s (2005) three-factor model of strategic thinking. Another framework of strategic thinking is that of Pisapia et al. (2005), who introduced three basic cognitive skills that describe a leader's capacity to think strategically: systems thinking, reframing, and reflection. *Systems thinking* refers to a "leader's ability to see systems holistically by understanding the properties, forces, patterns and interrelationships that shape the behavior of the system, which hence provides options for action" (p. 48). *Reflection* refers to a "leader's ability to weave logical and rational thinking, through the use of perceptions,

experience, and information, to make judgments on what has happened, and the creation of intuitive principles that guide future actions” (Pisapia et al., 2005, p. 52). *Reframing* refers to a “leader’s ability to switch attention across multiple perspectives, frames, mental models, and paradigms to generate new insights and options for actions” (Pisapia et al., 2005, p. 56).

Overall, J. Pisapia et al. (2009) concluded that strategic thinking is an individual’s capacity to “recognize patterns, interdependencies, and make consequential decisions” (p. 47). They suggested this capacity could be developed by practicing three cognitive skills: systems thinking, reframing, and reflecting. They also developed the Strategic Thinking Questionnaire to assess a person’s capacity to use these skills and think strategically. In their recent article, Dragoni,

Oh, Vankatwyk, and Tesluk (2011) defined this new construct as “a composite of the knowledge, skills, and abilities needed to detect market opportunities, formulate a vision to capitalize on these opportunities, and engineer feasible strategies to realize organizational and stakeholder value” (p. 830).

At the time when early strategic management researchers were using the term *strategic thinking* interchangeably with *strategic planning*, Liedtka (1998) pointed out the concern Mintzberg had at the beginning: “The term is not merely alternative nomenclature for everything falling under the umbrella of strategic management; rather, it is a particular way of thinking, with specific characteristics” (p. 121). Table 1 presents additional definitions of *strategic thinking* found in the literature.

Table 1. Other Definitions of Strategic Thinking

Source	Strategic thinking is defined as . . .
Dragoni, Oh, Vankatwyk, & Tesluk (2011, p. 830)	“A composite of the knowledge, skills, and abilities needed to detect market opportunities, formulate a vision to capitalize on these opportunities, and engineer feasible strategies to realize organizational and stakeholder value.”
Dragoni, Oh, Vankatwyk, & Tesluk (2011, p. 840)	“Ability to articulate a vision and shape strategy, demonstrate sound business judgment and attend to global business issues.”
Casey & Goldman (2010, p. 3)	“Conceptual, systems-oriented, directional and opportunistic thinking leading to the discovery of novel, imaginative organizational strategies.”
Baloch & Inam (2007, p. 3)	“A planning process aiming to create a strategy that is coherent, unifying, integrative framework for decisions especially about the direction of the business and resource utilization.”
Abraham (2005, p. 5)	“The process of finding alternative ways of competing and providing customer value.”
Hughes & Beatty (2005, p. 44)	“The collection, interpretation, generation, and evaluation of information and ideas that shape an organization’s sustainable competitive advantage.”
Bonn (2005, p. 335)	“Way of solving strategic problems that combine a rational and convergent approach with creative and divergent processes.”
Kaufman, Oakley-Browne, Watkins, & Leigh (2003, p. 40)	“The way in which people in an organization think about, assess, view and create the future for themselves and their associates.
Goldsmith (1996, p. 1437)	“The ability to learn from the environment while taking a broad point of view.”
Mintzberg (1994, p. 107)	“Capturing what the manager learns from all sources and then synthesizing that learning into a vision of the direction that the business should pursue.”
Stumpf (1989, p. 31)	“Identifying different ways for people to attain their chosen objectives and to determine what actions are needed to get them into the position they want to be in.”
Beaufre (1965, p. 29)	“A mental process . . . which must be capable of synthesizing both psychological and material data.”

Precursors of Strategic Thinking

The literature is replete with multiple factors that influence strategic thinking, ranging from environmental contingencies to individual differences. Their nature varies according to the way the construct is defined. Following Pisapia et al.’s (2005) conceptualization of strategic thinking, Pisapia et al. (2009) conducted a quantitative nonexperimental exploratory study based on a sample of 328 leadership students

from different parts of the world, including the United States. The results indicated the use of strategic thinking skills increased as the age of the participant rose.

At times, strategic thinking denotes an individual’s ability to make a decision under time pressure, which describes how accurately and quickly an individual reaches a solution to a given problem. Sarmany-Schuller (2010) found an individual’s ability to solve more tasks and present more accurate solutions under time pressure increases with age. On other occasions,

strategic thinking is the indication of personality traits. For example, Seggelen-Damen (2013) examined the personality traits that influence the reflection element of strategic thinking. Among the three factors considered (need for cognition, openness to experience, and private self-consciousness), the need for cognition and private self-consciousness were found to have a substantive effect on reflection. Also, Karğın and Aktaş (2012) conducted a quantitative study to measure strategic thinking as conceptualized by Pisapia et al. (2005). The researchers used a cross-sectional survey to collect data from a sample of 244 certified professional accountants (CPAs) and CPA trainees. The results indicated that position difference significantly influenced all three dimensions of strategic thinking (systems thinking, reframing, and reflection).

Narayanan, Zane, and Kemmerer (2011) referred to strategic thinking as strategic cognition or the cognitive perspective of strategy. They conceptualized strategic cognition as top managers' beliefs about the organizational environment (cognitive structures), the cognitive activities (processes) involved in the strategic formulation (scanning, sense making, and decision making), and strategic implementation (sense giving, sense making, issue selling). Narayanan et al. conducted an integral review of strategic management literature. Using primary databases such as ABI/INFORM Global, the researchers selected 164 articles published from 1993 to 2007 and examined antecedents and outcomes of strategic cognition. Results showed causal relationships between cognitive structures and cognitive processes. Also, Narayanan et al. found various precursors for strategic cognition: uncertainty in environments, organizational routine, and global business experience.

In studying a sample of 703 executives, Dragoni et al. (2011) found that cognitive ability and accumulated work experience were the two most significant predictors for strategic thinking competency. Specifically, cognitive ability explained 78.9% of the variance in strategic thinking competency, followed by accumulated work experience (7.0%), openness (2.6%), and extraversion (2.3%). Several years ago, Wally and Baum (1994) conceptualized strategic thinking as an intellectual activity that takes place during a strategic decision-making process. They used a survey method to collect quantitative data from a sample of 151 CEOs from 306 firms, and they tested personal and structural determinants of strategic decision-making steps. The findings showed individual differences (e.g., cognitive ability, intuition, tolerance for risk, and propensity to act) and structural factor (centralization) positively influenced strategic decision making.

All things considered, strategic thinking does not occur in a vacuum. Environmental stimuli play a role, as organization culture theorists have suggested. After

all, organizational culture has been touted to relate to a wide range of strategic outcomes (Yafang, 2011; Yazici, 2011). Moreover, the problems facing today's leaders are complex, intertwined, and hard to predict. As a result, leaders tap into the culture of their organizations to shape their decisions (Deshpandé, Farley, & Webster, 1993). Additionally, Robbins and Coulter (2005) argued that organizational culture echoes the values, beliefs, or perceptions that employees hold within an organization, which they use to interpret and respond to internal or external situations they face.

In essence, researchers have classified organizational culture into four categories—clan, hierarchy, adhocracy, and market—based on the competing values framework of Quinn, Cameron, and Rohrbaugh (1983). The strategic emphasis of a *clan* is geared toward developing people, fostering employee commitment, and supporting the morale of the workforce (Deshpandé et al., 1993). The strategic emphasis of *hierarchy* is stability, predictability, and smooth operations (Deshpandé et al., 1993). In the *adhocracy* culture, the strategic focus is on innovation, growth, and new resources (Deshpandé et al., 1993). Finally, in a *market* culture, competitive advantage and market superiority are considered to be strategy drivers. Many potential predictors have also provided insights into the way leaders develop strategic thinking. They range from age, time span, and education level to position type. This study focused on the effect of personality traits and information processing styles.

Personality traits. Researchers have conceptualized personality traits from various perspectives. One of the popular frameworks is the five-factor model developed in 1976 by Costa and McCrae. The five-factor model comprises five dimensions: agreeableness, conscientiousness, neuroticism, extraversion, and openness to experience (McCrae & John, 1992). Among these personality traits, extraversion and openness to experience were found to positively influence a leader's ability to think strategically, in a study that examined 703 executives (Dragoni et al., 2011). Research also shows that individuals with the extraversion personality trait are proactive (Fuller & Marler, 2009); they assume tough and complex roles and like to take on new challenges (Judge, Higgins, Thoresen, & Barrick, 1999). Also, Bono and Judge (2004) found a robust and consistent correlation between extraversion and transformational leadership. Although Ellis et al. (2003) cautioned that agreeableness could lead to a premature conclusion on strategic issues when leaders fail to reflect on their preferences, Neuman and Wright (1999) contended those leaders are nevertheless good at building consensus and avoiding interpersonal conflicts.

Furthermore, research shows that people who are open to experience are imaginative, curious, broad-

minded, and intelligent (Barrick & Mount, 1991). They are known as being creative and motivated to grow (Hendricks & Payne, 2007). Specifically, researchers found that experiential learning influences the development of strategic thinking (Casey & Goldman, 2010; Goldman & Casey, 2010). In Judge, Bono, Ilies, and Gerhardt's (2002) meta-analysis, both extraversion and openness to experience were positively related to leadership effectiveness. Koruklu (2015) found these two personality traits were positively correlated with social problem solving. Given these points, this researcher posited that personality traits, according to McCrae and John's (1992) five-factor model, would influence leaders' strategic thinking. Hence, the following hypotheses guided the study:

Hypothesis 1: Extraversion influences leaders' strategic thinking.

Hypothesis 2: Agreeableness influences leaders' strategic thinking.

Hypothesis 3: Conscientiousness influences leaders' strategic thinking.

Hypothesis 4: Emotional stability influences leaders' strategic thinking.

Hypothesis 5: Openness to experiences influences leaders' strategic thinking.

Information processing styles. Information processing styles derive from cognitive-experiential self-theory, proposed by Epstein (1994). Cognitive-experiential self-theory refers to two independent and interactive ways in which people process information: rational system and intuitive-experiential system (Epstein, 2003). Together, these two information processing styles describe people's preference for thinking styles. According to this theory, rational information-processing people process information consciously and logically but mostly slowly. They rely on logic and facts. In contrast, intuitive-experiential information-processing people process information rapidly but mostly nonconsciously. They rely on experience (Epstein, 1998).

Research shows that information processing styles influence the speed and quality of strategic decisions. For example, Wally and Baum (1994) found that intuition information processing positively links with quick strategic decision making. Further, Khatri and Ng (2000) studied 281 senior managers from computer, banking, and utility companies in the United States, and found the use of intuition in decision making was positively related to organizational performance. Also, Neuert and Hoeckel (2013) found evidence that people who use unconscious thoughts (intuition-experiential) perform well when facing complex and uncertain decision-making situations, whereas people who use conscious and deliberate strategies (rational) perform well when facing simple decision-making situations. As a result, this researcher

postulated that information processing styles, as conceptualized by Epstein, Pacini, and Norris (1998), would influence leaders' strategic thinking. Hence, the following hypotheses guided the study:

Hypothesis 6: Rational engagement influences strategic thinking.

Hypothesis 7: Experiential ability influences strategic thinking.

In summary, the working assumption underlying this study is that leaders who have specific personality types and process information in a particular way will likely exhibit a strategic thinking skill. As this skill has become the archetype of leadership success, specific factors that contribute to its development still lack an empirical validation. The purpose of this study was to add to the field of strategic leadership by examining the influence of personality traits and information processing styles on strategic thinking from a viewpoint that is measurable and predictable.

Method

Traditionally, critical factors of strategic thinking have been investigated using experiments, expert judgments, and observers' ratings. In this study, the researcher used a nonexperimental quantitative method with a cross-sectional survey to test a predictive model of strategic thinking. The strength of this approach is grounded in its historical contribution to various fields of social sciences (Duffy, 1986; Meha, 1982). This approach derives from the positivist paradigm, according to which reality is objective, measurable, unbiased, and independent from both the researcher and the subject under investigation (Bielefeld, 2006; Firestone, 1987; Johnson & Onwuegbuzie, 2004). This detachment ensures the neutrality of the research and prevents the researcher from biasing the findings (Carr, 1994).

Currently, a plethora of viewpoints about strategic thinking exist. Even so, opinions continue to differ. This researcher was particularly interested in measuring relationships, if any, making standardized comparisons, and drawing generalizable inferences. A quantitative method was appropriate in this case. Furthermore, strategic thinking is primarily about solving problems (Bonn, 2005; Jacobs & Jaques, 1987). As Matthew Schmidt, assistant professor at the School of Advanced Military Studies noted, "Problems in the normal sense of the word involve the quantitative mode of thinking" (as cited in Wolters, Grome, & Hinds, 2013, p. 221). This study arose from both theoretical and methodological assumptions that objective evidence is needed to close the existing gap in the strategic thinking literature.

Measures and Data Collection

A composite of three existing survey instruments for a total of 45 questions was used to collect data:

1. Pisapia's 25-item Strategic Thinking Questionnaire (Pisapia, 2009; Pisapia et al., 2005) measured three dimensions of strategic thinking—systems thinking, reframing, and reflection—with internal consistency coefficients of .735, .773, and .762, respectively (Pisapia, Morris, Cavanaugh, & Ellington, 2011).
2. The short version of McCrae and John's (1992) five-factor model and Gosling, Rentfrow, and Swann's (2003) 10-item Personality Inventory (TIPI) measured personality traits.
3. Ten items from Epstein, Pacini, and Norris's (1998) Rational-Experiential Inventory (REI-10) measured two dimensions of information processing style—rational engagement and experiential ability—with internal consistency coefficients of .73 and .72, respectively (Epstein, Pacini, Denes-Raj, & Heier, 1996).

A total of 125 U.S. executives and managers across professions and sectors of activities were invited to take a web-based self-report survey on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), to determine their level of agreement. The study adhered to the *Belmont Report's* principles of respect for persons, beneficence, and justice applicable to research involving human subjects, as specified by the U.S. Department of Health and Human Services (2010). Specifically, participation in the study was voluntary. Each participant had the option to opt out at any time. Before the study began, participants were provided an informed consent form to either sign or decline. Participants were not requested to disclose their personally identifiable information. Also, no financial, business, personal, or professional relationships existed between the researcher and the participants that could have affected the integrity of the study.

Data Analyses

Of the 125 participants invited to take the survey, 97 responded, for a response rate of 78%. Further, when unqualified respondents and incomplete responses were screened out, only 48 responses were retained and deemed suitable for statistical analysis. Statistical

significance was established at $\alpha = 0.05$ and a significance level of $p < .05$ was retained for rejecting the null hypotheses. The reliability of each measure was assessed using Cronbach's alpha (α) scores. The overall alpha score for the Strategic Thinking Questionnaire was .937. The current sample provided $\alpha = .613$ for the REI-10. The sample also supported the reliability model assumption for the TIPI. Given the context and objectives of the study, the three instruments were deemed appropriate for collecting the data.

Statistical tests revealed no significant outliers as determined by Cook's distance values less than 1. There was normality for all group combinations of personality traits and information procession styles, as assessed by the Shapiro–Wilk test ($p > .05$). In addition, the residuals appeared to be approximately normally distributed according to a visual inspection of the histogram and P-P plot. There was also a linear relationship between the variables, as established by visual inspection of partial regression plots of studentized residuals against the predicted values. The assumption of homoscedasticity was also satisfied, as evidenced by the scatterplots of the studentized residuals against unstudentized predicted values, which showed equally spread residuals over the dependent variable. The assumption of independence of errors was satisfied, as assessed by Durbin–Watson statistic of 2.082. Finally, there was no multicollinearity, as assessed by tolerance values all greater than .1. Therefore, the data fit the multiple regression model.

Results

When participants were asked to provide their opinions about the culture of their organizations, as defined earlier, the majority ($n = 20$, 41.17%) identified their organizations with *clan*. More than half ($n = 13$, 27.1%) identified with *hierarchy*. Close to half ($n = 10$, 20.8%) identified with *adhocracy*. A few ($n = 5$, 10.4%) identified with *market*. Also, when participants were asked to provide their demographic variables, the majority of respondents ($n = 20$, 41.7%) reported they have been in their current position less than five years. The majority ($n = 21$, 43.80%) reported they have graduated from college. The majority ($n = 31$, 64.60%) also reported they were women. Finally, the majority of participants ($n = 31$, 64.5%) reported they were between 30 and 59 years old. The following tables provide the codification for measurement purposes (Table 2), a detailed report of the descriptive statistics (Tables 3 & 4), and the model summary (Tables 5, 6, & 7).

Table 2. Codification

Code	Definition
STA	Strategic thinking ability
SYSTK	System thinking
REFR	Reframing
REFLT	Reflection
IPT	Individual personality traits
EXTRAV	Extraversion
AGREA	Agreeableness
CONSCI	Conscientiousness
EMOST	Emotional stability
OPENX	Openness to experiences
IPS	Information processing styles
RATENG	Rational engagement
EXPRAB	Experiential ability

Table 3. Descriptive Statistics of Strategic Thinking

		SYSTK	REFR	REFLT	STA	Valid N (listwise)
<i>N</i>	Statistic	48	48	48	48	48
Range	Statistic	3.00	2.75	3.00	2.88	
Minimum	Statistic	2.00	2.25	2.00	2.13	
Maximum	Statistic	5.00	5.00	5.00	5.00	
Sum		182.63	159.63	192.25	178.63	
Mean	Statistic	3.8047	3.3255	4.0052	3.7214	
	Std. error	.10566	.07893	.10612	.08776	
Std. deviation	Statistic	.73201	.54684	.73521	.60802	
Variance	Statistic	.536	.299	.541	.370	
Skewness	Statistic	-.563	.542	-.548	-.447	
	Std. error	.343	.343	.343	.343	
Kurtosis	Statistic	.063	.839	-.095	.361	
	Std. error	.674	.674	.674	.674	

Table 4. Descriptive Statistics for the Predictor Variables

	Mean	Std. deviation	<i>N</i>
STA	3.7214	.60802	48
EXTRAV	3.3229	.61445	48
AGREA	3.3229	.63989	48
CONSCI	3.0104	.45534	48
EMOST	3.1667	.57735	48
OPENX	3.0417	.39724	48
RATENG	2.7167	.42643	48
EXPRAB	3.7375	.73821	48

Table 5. Summary of the Multiple Regression Model

Model Summary ^a					
Model	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	Std. error of the estimate	Durbin-Watson
1	.522 ^b	.272	.145	.56236	2.082

a. Dependent variable: STA.

b. Predictors: (Constant), EXPRAB, OPENX, EXTRAV, CONSCI, AGREA, RATENG, EMOST.

Table 6. ANOVA^a

Model	Sum of squares	df	Mean square	F	Sig.
1 Regression	4.726	7	.675	2.135	.062 ^b
Residual	12.650	40	.316		
Total	17.376	47			

a. Dependent Variable: STA.

b. Predictors: (Constant), EXPRAB, OPENX, EXTRAV, CONSCI, AGREA, RATENG, EMOST.

Table 7. Coefficients

Model	Unstandardized co- efficients		Standardized co- efficients		Sig.	95% confidence in- terval for B		Correlations			Collinearity statistics	
	B	Std. er- ror	Beta	t		Lower bound	Upper bound	Zero-order	Partial	Partial	Tolerance	VIF
1 (Constant)	3.446	1.041		3.310	.002	1.342	5.549					
EXTRAV	.383	.149	.387	2.575	.014	.082	.684	.406	.377	.347	.804	1.244
AGREA	.220	.146	.231	1.507	.140	-.075	.514	.301	.232	.203	.773	1.293
CONSCI	-.382	.210	-.286	-1.815	.077	-.807	.043	-.231	-.276	-.245	.733	1.365
EMOST	-.091	.170	-.087	-.535	.595	-.436	.253	.117	-.084	-.072	.695	1.440
OPENX	.047	.239	.031	.198	.844	-.436	.530	-.129	.031	.027	.746	1.340
RATENG	-.143	.215	-.100	-.664	.511	-.577	.292	.063	-.104	-.090	.802	1.247
EXPRAB	-.012	.116	-.015	-.105	.917	-.246	.222	.039	-.017	-.014	.923	1.083

Note. Dependent variable: STA.

To determine which personality traits influence strategic thinking ($M = 3.7214$, $SD = .60802$), multiple regression analyses were carried out. The results indicated extraversion ($M = 3.3229$, $SD = .61445$) and agreeableness ($M = 3.3229$, $SD = .63989$) predict strategic thinking. The results also showed a weak positive relationship between extraversion and strategic thinking ($R = .406$). The coefficient of determination ($R^2 = .165$) indicated that extraversion explains 16.5% in the variability of strategic thinking. Further, the multiple regression model statistically significantly predicts strategic thinking ($F[1, 46] = 9.087$, $p = .004$). Furthermore, the results showed a weak positive relationship between agreeableness and strategic thinking ($R = .301$). The coefficient of determination ($R^2 = .091$) indicated that agreeableness explains 9.1% in the variability of strategic thinking. Also, the multiple regression model statistically significantly predicts strategic thinking ($F[1, 46] = 4.587$, $p = .038$). In total, there was enough sample evidence to support the claim that extraversion and agreeableness personality traits statistically significantly influence strategic thinking. Therefore, the null hypotheses that stated extraversion and agreeableness do not influence strategic thinking were rejected.

With regard to conscientiousness ($M = 3.0104$, $SD = .45534$), emotional stability ($M = 3.1667$, $SD = .57735$), and openness to experiences ($M = 3.0417$, $SD = .39724$), the results showed weak positive relationships with strategic thinking. Also, the multiple regression model did not statistically significantly predict strategic thinking (conscientiousness, $R = .231$, $F[1, 46] = 2.594$, $p = .114$; emotional stability, $R = .117$, $F[1, 49] = .643$, $p = .427$; openness to experiences, $R = .129$, $F[1, 46] = .771$, $p = .382$). In conclusion, there was not enough sample evidence to support the claim that conscientiousness, emotional stability, and openness to experience statistically significantly influence strategic thinking. Therefore, the null hypotheses that

stated conscientiousness, emotional stability, and openness to experiences do not influence strategic thinking failed to be rejected.

Furthermore, the results of a multiple regression analysis to determine which information processing styles influence strategic thinking showed that neither rational engagement ($M = 2.7167$, $SD = .42643$) nor experiential ability ($M = 3.7375$, $SD = .73821$) statistically significantly influences strategic thinking ($M = 3.7214$, $SD = .60802$). Therefore, the multiple regression model did not statistically significantly predict strategic thinking (rational engagement, $R = .063$, $F[1, 46] = .184$, $p = .670$; experiential ability, $R = .039$, $F[1, 49] = .071$, $p = .790$). In conclusion, there was not enough sample evidence to support the claim that rational engagement and experiential ability statistically significantly influence strategic thinking. Therefore, the null hypotheses that stated rational engagement and experiential ability do not influence strategic thinking failed to be rejected. The overall model was not statistically significant ($F[7, 40] = 2.135$, $p < .05$, adj. $R^2 = .145$). The equation could be expressed as follows: Predicted STA = $3.446 + .383(\text{EXTRAV}) + .220(\text{AGREA}) - .382(\text{CONSCI}) - .091(\text{EMOST}) + .047(\text{OPENX}) - .143(\text{RATENG}) - .012(\text{EXPRAB})$.

Even though it was not formally hypothesized, a hierarchical multiple regression was run to determine whether including the control variables in the equation would increase the prediction of strategic thinking and whether the increase would be statistically significant. The results showed that the variances explained (R^2) in strategic thinking gradually increased as each control variable was progressively added to the equation. However, the full model was not statistically significant ($R^2 = .068$, $F[6, 41] = .499$, $p > .05$, adj. $R^2 = .068$). Table 5 provided the summary of the multiple regression model; Table 8 provides the summary of the hierarchical multiple regression model.

Table 8. Summary of the Hierarchical Multiple Regression Model

		ANOVA ^a				
Model		Sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.
1	Regression	.066	1	.066	.176	.676 ^b
	Residual	17.309	46	.376		
	Total	17.376	47			
2	Regression	1.016	2	.508	1.398	.258 ^c
	Residual	16.359	45	.364		
	Total	17.376	47			
3	Regression	1.018	3	.339	.913	.442 ^d
	Residual	16.357	44	.372		
	Total	17.376	47			
4	Regression	1.064	4	.266	.702	.595 ^e
	Residual	16.311	43	.379		
	Total	17.376	47			
5	Regression	1.105	5	.221	.570	.722 ^f
	Residual	16.271	42	.387		
	Total	17.376	47			
6	Regression	1.183	6	.197	.499	.805 ^g
	Residual	16.192	41	.395		
	Total	17.376	47			

a. Dependent variable: STA.

b. Predictors: (Constant), IPS.

c. Predictors: (Constant), IPS, IPT.

d. Predictors: (Constant), IPS, IPT, organizational culture.

e. Predictors: (Constant), IPS, IPT, organizational culture, years in current position.

f. Predictors: (Constant), IPS, IPT, organizational culture, years in current position, education.

g. Predictors: (Constant), IPS, IPT, organizational culture, years in current position, education, gender.

Discussion

This study emerged from the premise that individual differences could explain organization leaders' strategic thinking and therefore their ability to successfully plan and execute strategies. While the findings were not conclusive, they demonstrated that extraversion and agreeableness, in particular, play a role. It should be noted that several contextual factors that could influence leaders' strategic thinking were not examined in this study. Therefore, future research is needed to make this model more robust. In the interim, strategic thinking continues to be a critical skill for leaders in both private and public sectors. Unlike the private sector, there is a constant need in the public sector to recruit and develop high-quality leaders at all levels to meet today's and future challenges. In 2014, Goldenkoff projected that more than 30% of all U.S. government permanent employees would be eligible to retire by September 2017. If this situation is not addressed, skill gaps could undermine government operations.

This study has a practical implication for public administration. In the face of declining budgets and shifting priorities, public administration remains concerned with the effective implementation of policies and programs, efficient management of resources, and successful execution of missions. The study provided insights as to how government and public organiza-

tions can continue to draw strategic thinkers to fill critical positions. The study will inspire human resource professionals to recalibrate their existing leadership programs. Furthermore, the study can be a step toward a meaningful mechanism of screening and developing strategic thinking leaders. Finally, the study can provide a basis for discussion forums among scholar-practitioners as incubators for strategic thinking in which exchange of innovative ideas can take place.

Conclusion

This study added to the ongoing discussion about effective planning and execution of organizational missions, and contributed to the growing knowledge that individual differences provide a meaningful framework for a successful strategy. At a time when leaders across a spectrum of organizations are facing unprecedented socioeconomic challenges, strategic thinkers are much needed to rise to the occasion. Such leaders come on board with complex individual differences and diverse backgrounds. While a single study may not indicate how these differences interplay to strengthen this important skill, it demonstrates that several proximal and distal precursors may influence its development. Moreover, as the need to fill strategic positions continues to grow in many organizations, particularly in government and public organizations, a

search for predictive characteristics should continue. Scholar-practitioners are encouraged to build upon what was learned from this study, formulate new hypotheses, and strive to improve the model. This study calls for further research about individual differences in developing strategic thinking and the way in which contextual factors can influence the outcome.

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