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CEO relational leadership and strategic decision quality in top management teams: The role of team trust and learning from failure

Abraham Carmeli and Asher Tishler
Tel Aviv University, Israel

Amy C. Edmondson
Harvard University, USA

Abstract
In this study, we examine a complex pathway through which CEOs, who exhibit relational leadership, may improve the quality of strategic decisions of their top management teams (TMTs) by creating psychological conditions of trust and facilitating learning from failures in their teams. Structural equation modeling (SEM) analyses of survey data collected from 77 TMTs indicate that (1) the relationship between CEO relational leadership and team learning from failures was mediated by trust between TMT members; (2) team learning from failures mediated the relationship between team trust and strategic decision quality. Supplemented by qualitative data from two TMTs, these findings suggest that CEOs can improve the quality of strategic decisions their TMTs make by shaping a relational context of trust and facilitating learning from failures.

Keywords
CEO relational leadership, learning from failures, strategic decisions, top management teams, trust

Introduction

Upper echelon research has amply illustrated the power of chief executive officer (CEO) leadership in driving organizational performance (Hambrick, 2007; Hambrick and Finkelstein, 1987; Hambrick and Mason, 1984). Yet a better understanding of the mechanisms and conditions that account for these leadership effects is needed (e.g., Peterson et al., 2003; Waldman et al., 2001). Upper echelon scholars have also called for an integrative approach to unravel processes at different levels (CEO, team, and organization), but this kind of research has been slow to accumulate (Boone and Van Witteloostijn, 2007; Boone et al., 1996; Carmeli et al., 2010; Hambrick, 2007). Research on CEO leadership, top management team (TMT) processes, and outcomes has been limited by the challenges of acquiring access to such teams and their processes. Much of the existing research has thus focused on CEO characteristics (e.g., age, tenure) and TMT (homogeneous and heterogeneous) composition – attributes that can be found in public data sources – and only a

handful of attempts have examined CEO leadership behaviors and TMT processes and outcomes (e.g., Carmeli et al., 2010, 2011; Ling et al., 2008). Understanding these processes is crucial, because CEOs hold a unique position of influence on the processes within the TMT and its outcomes (Edmondson et al., 2003a; Hambrick, 1994). We offer a socio-learning approach that emphasizes relational qualities of CEO leadership and the learning potential provided by experiences of failure, which, unlike research on non-executive teams (Hirak et al., in press), can inform the phenomenon of TMT decision-making processes.

This study contributes to this line of research by examining how CEO relational leadership facilitates learning from failures and improves strategic decisions in the TMT. Making strategic decisions is a complex and challenging task (Elbanna and Child, 2007b). It involves integrating the diverse perceptions, judgments, and orientations of TMT members to develop a set of specific strategic actions (Hambrick, 2007). When members of TMTs work together, they bring diverse experience to solve such difficult and unstructured problems as strategy making, while building involvement and commitment of key senior executives (Ancona and Nadler, 1989; Bauman et al., 1997). At the same time, research suggests that TMTs often fail to achieve synergy (Hackman, 1990; Hambrick, 1994; Katzenbach, 1998), find it difficult to resolve conflicts (Amason, 1996; Edmondson and Smith, 2006), build commitment (Wooldridge and Floyd, 1990), or reach closure in a timely fashion (Eisenhardt, 1989; Hickson et al., 1986).

Evidence suggests that senior executives and their management teams fail frequently and often remarkably when making strategic choices (Nutt, 2002, 2004), in part because executive teams face decisions that are both ill-structured and complex (Edmondson et al., 2003a; Eisenhardt, 1999). Since TMTs are likely to make numerous strategic choices during their tenure, whether and why some TMTs learn from their direct experience to improve their decisions and others do not is an important question for team research which increasingly seeks understanding of teams in varied contexts, from the operating room to the board room (Edmondson et al., 2007; Wageman et al., 2008). In this article, we address a specific type of learning from experience – learning from failures – thereby responding to calls for further research on learning from failures in the workplace (e.g., Baumard and Starbuck, 2005; Cannon and Edmondson, 2005; Carmeli and Schaubroeck, 2008; Haunschild and Sullivan, 2002; Sitkin, 1992; Tucker and Edmondson, 2003). The complexity of the strategic work that TMTs must handle makes failures virtually inevitable. While research on group learning has increased since the 1990s, evidence of contextual factors that facilitate or inhibit these processes is limited. Exploring this issue is essential because the extant literature suggests that contextual factors such as a team's learning climate and leader behavior are key in facilitating or inhibiting team learning processes, and thereby influence work outcomes (Edmondson, 1999, 2004; Kozlowski and Ilgen, 2006).

Our study extends the literatures on team learning and upper echelons by examining whether TMT learning from failures improves strategic decisions, and by investigating the role of CEO relational leadership in both facilitating learning from failures and reaching quality strategic decisions. We contribute to theory and research by addressing a recent call to examine 'other important dimensions of (CEO) leadership', as it has the potential to increase our understanding of the ways CEOs influence TMT processes and outcomes (Carmeli et al., 2011: 408). We propose a potentially important pathway by which CEOs can improve TMT strategic decisions by building trust, which in turn facilitates team learning from failures. We focus on CEO relational leadership, drawing on an emergent area of research dealing with relationship building (Fletcher, 2004). We examine CEO relational leadership as a factor in shaping such contextual conditions as trust between TMT members, which may facilitate learning processes (Edmondson, 2004; Nembhard and Edmondson, 2006). Thus we provide one of the first studies that attempts to link CEO relational leadership and

strategic decisions, and respond to research calls to go beyond TMT demographic variables and organizational outcomes and examine intervening process constructs (Lawrence, 1997). We seek to broaden this line of research and deepen our understanding of the contextual factors that affect strategic decision-making practices in TMTs (Hambrick, 1994; Pettigrew, 1992; Smith et al., 1994).

Theory and hypotheses

Learning from failures and strategic decisions

Team learning refers to a process of action and reflection (Edmondson, 1999), through which knowledge is acquired, shared, and combined (Argote, 1999; Argote et al., 2001). The process by which team members reflect on their mission, tasks, and processes also has been referred to as reflexivity (Carter and West, 1998), and been shown to promote motivation to process information systematically through open group discussion, thereby enabling the selection of a correct decision alternative (Scholten et al., 2007). Through learning, a group improves its effectiveness by increasing the processing, not the amount, of information (De Dreu, 2007).

Effective team learning takes discipline and skill (Edmondson, 2002), and can lead to a relatively permanent alteration in the collective level of knowledge and skill produced by the shared experience of the team members (Ellis et al., 2003). Teams learn when members engage in trial and error and joint problem solving (Edmondson, 1999, 2002). Learning involves a willingness to detect resemblances between past and current situations and their underlying causes and effects (Argyris and Schön, 1978; Tjosvold et al., 2004; Turner and Toft, 2006) or through a performance feedback gap (Argote and Greve, 2007). Furthermore, it involves critical thinking (Dewey, 1986 [1933]), encountering problems (Cyert and March, 1963), engaging failures, investigating problems, and using error management programs (Carmeli and Gittell, 2009; Carroll et al., 2006; Keith and Frese, 2005; Weick and Sutcliffe, 2001).

Our focus is on team learning from failures, defined here as the extent to which a TMT reflects upon the problems and errors it experiences, interprets and makes sense of why they occurred, and discusses what actions are needed to produce improved outcomes. Theory and research point to the importance of learning from failures as a process through which better outcomes can be attained (Baumard and Starbuck, 2005; Edmondson, 1996; Madsen and Desai, 2010; Reagans et al., 2005; Sitkin, 1992; Tucker and Edmondson, 2003). Specifically, learning from experiences of failure is useful for cultivating mindful attention to work processes (Weick and Sutcliffe, 2001; Weick et al., 1999), thereby decreasing subsequent accident and incident rates (Haunschild and Sullivan, 2002), reducing the risk of future accidents and failure (Baum and Ingram, 1998), improving system reliability (Weick and Sutcliffe, 2001) and crisis-preparedness (Carmeli and Schaubroeck, 2008; Nystrom and Starbuck, 1984), and enhancing outcomes such as service quality, safety, adaptability, innovativeness, and productivity (Argote and Darr, 2000; Argote et al., 1990; Cannon and Edmondson, 2005; Carmeli and Sheaffer, 2008; Sitkin, 1992).

We suggest that TMTs that engage in the process of learning from failures (that is, the teams actively learn from direct experiences of failure) are likely to make higher quality strategic decisions than TMTs that do not learn from their failures. Strategic decisions address complex and ambiguous issues such as penetrating an occupied market or entering a new market, responding to a competitive attack, and developing core capabilities, technologies, and products that involve large amounts (i.e., commitment) of organizational resources (Amason, 1996; Mason and Mitroff, 1981). Following Amason (1996), the quality of TMT strategic decisions is defined as the extent to which the effects of these choices on the company have been poor or good.

Senior executives often encounter contextual pressures that lead them to persist with their prior strategic choices and orientation. They thus tend to disregard signals that their choices and orientations are no longer appropriate (Milliken and Lant, 1991). When a TMT reflects upon past experiences and attempts to thoroughly understand what went wrong its members are more mindful and comprehensive. That is, TMT members open themselves up to new opportunities and options, and may be capable of overcoming potential biases such as sunk costs and escalation of commitment. In addition, they are able to fully comprehend the experience in context, thus allowing them to more fully realize the implications for choices to be made and the best ways to pursue them (Dillon and Tinsley, 2008).

Research suggests that managerial cognition (executives' mental models) underpins the choices and decisions that executives make (Day and Lord, 1992; Walsh, 1995). A team mental model is conceptualized as the shared knowledge representation and organized understanding of the team's task environment (Cannon-Bowers et al., 1993; Klimoski and Mohammed, 1994). Mental models enable team members 'to organize and acquire information necessary to anticipate and execute actions' (Kozlowski and Ilgen, 2006: 83), thus cultivating a shared understanding about the equipment used by the team, the tasks and problems the team has to cope with, as well as recognizing individual team members' knowledge and perceptions, and team members' beliefs about effective processes (Cannon-Bowers et al., 1993). Research suggests that decision-makers use mental models to imagine their competitors' strategic orientations (Reger and Huff, 1993), as a process by which they define the competition and interpret the competitive conditions in the task environment (Porac and Thomas, 1990). This is in line with upper echelon theory, which maintains that cognitive models held by the senior management teams influence their strategic choices and orientations (Finkelstein and Hambrick, 1996; Hambrick and Mason, 1984).

Learning from experience produces tacit knowledge, which helps explain why teams at different sites learn at significantly different rates. When teams learn from experience the tacit knowledge acquired requires proactive coordination for its transfer and use (Edmondson et al., 2003b). In addition, learning from failures may involve team members figuring out who knows what (i.e., transactive memory system; Wegner, 1995) and what role each member played in the failure experience. Team members benefit from knowledge gained by others, which enables them to diagnose a problem, or determine how to divide and coordinate activities and make better decisions (Reagans et al., 2005).

Theory and research also point to the advantages of a double-loop learning process where errors are not only detected and corrected, but the underlying causes are also explored or challenged (Argyris and Schön, 1978), especially when much is at stake. Learning from failures in TMTs requires a willingness to seek root causes and understand the sequences of events that produced them. This can help executives become willing to abandon prior commitments to a course of action that no longer makes sense (Ross and Staw, 1993). Unlike success, experiencing failures can inhibit an inclination toward inertia and increase openness to exploring new opportunities or alternative courses of action (Amason and Mooney, 2008; Cyert and March, 1963).

Consistent with this notion, we suggest that when teams actively learn from experiences of failure they may benefit from having accountability diffused among members rather than being borne by an individual member. This learning process thus allows team members to share information and expertise to put the issue in context and to challenge their own assumptions and practices to improve their decision-making. When teams learn from failures they engage in a type of critical yet constructive discussion that is aimed not to place blame on team members but rather to understand the root issue and what needs to be revised and refined. The experience itself can influence subsequent decisions and behaviors (Simon and Lieberman, 2010) and thus a reflection

process, particularly on experiences of failures, can improve decision quality and drive outcomes such as high reliability (Weick and Sutcliffe, 2001).

Taken together, we predict that TMTs that reflect on failure experiences, interpret and make sense of them, will make higher quality strategic decisions.

HYPOTHESIS 1: TMT learning from failures will be positively related to quality strategic decisions.

TMT trust, learning from failures, and strategic decisions

Despite the potential benefits, research indicates that teams vary significantly in the extent to which they actively learn from experience (Dutton and Thomas, 1984; Reagans et al., 2005). Furthermore, due to structural inertia and other persistent forces, organizational systems may inhibit making changes based on learning from failure such that the learning is not translated into necessary adaptations in strategic orientations (Lant et al., 1992). To facilitate learning from failed experiences, we need to better understand 'barriers to learning from failure and identifying strategies to overcome them' (Wilkinson and Mellahi, 2005: 233). One barrier is lack of trust among team members. Conversely, when there is trust within the TMT, its members are more fully engaged in learning from failures and can make better strategic decisions.

Trust is a core relational construct, commonly conceptualized as a psychological state in which individuals make themselves vulnerable in a relationship based upon expectations, assumptions, or beliefs that another's future behaviors will be positive, beneficial, or favorable (Deutsch, 1958; Robinson, 1996; Rousseau et al., 1998). Thus, trust denotes 'the willingness of a party to be vulnerable to the actions of another party' (Mayer et al., 1995: 712) and is an expression of confidence by a party that his or her vulnerability will not be exploited and that he or she will not be harmed by the behaviors or actions of the other party (Jones and George, 1998).

Trust within TMTs is a key psychological state that enables members to engage in learning from failures. Trust is likely to increase members' sense of confidence that speaking up is accepted and expected, and allows them to admit and take responsibility for errors and problems and discuss them openly (Edmondson, 1999, 2004). Tjosvold et al.'s (2004) findings indicate that a cooperative orientation is positively related to team learning from mistakes. Further, when teams discuss and reflect on problem and error relationships, destructive conflicts may emerge between their members. While task and process conflicts are important for improving processes and outcomes, research suggests that cognitive and constructive conflicts may reach a level where they become destructive (Jehn and Bendersky, 2003). This is particularly applicable to situations where team members reflect on failed experiences, which can be stressful. Research has indicated that task and relational conflicts are tightly related (Jehn and Bendersky, 2003) and that trust within teams may be a fruitful mechanism as it moderates this linkage by helping TMT members to tolerate task conflicts in a way that does not slide into destructive relationship conflicts (Simons and Peterson, 2000). Thus, trust enables TMT members to handle conflicts that can emerge while discussing problems and errors associated with work tasks and processes.

We also reason that trust within TMTs is indirectly, through learning from failures, associated with quality strategic decisions. Studies have reported inconsistent findings about the direct effect of trust on behaviors and outcomes (see Dirks and Ferrin, 2001). We reason that this is because trust, as a psychological state, is essential for facilitating work processes that may give rise to work behaviors and outcomes. As a psychological state, trust is likely to have an indirect effect on the quality of strategic decisions of a TMT because it underpins learning from failed experiences. Trust enables learning in the form of reflection on what has happened (Edmondson et al., 2003a). This

process alleviates a tendency to oversimplify events (Weick and Sutcliffe, 2001), enables comprehensiveness (Fredrickson and Mitchell, 1984), and builds decision-makers' confidence in that they have left 'no stone unturned in the decision making' (Eisenhardt, 1989: 572). This constellation of cognitive, conflict, and emotional processes is essential for quality choices and closure (Eisenhardt, 1989). Thus,

HYPOTHESIS 2: TMT trust (trust among members of a TMT) will be positively related to TMT learning from failures.

HYPOTHESIS 3: The relationship between TMT trust (trust among members of a TMT) and quality strategic decisions will be mediated by TMT learning from failures.

CEO relational leadership, TMT trust, and learning from failures

Recent research has pointed to relational aspects of leadership that are essential for developing psychological states that facilitate learning processes (Edmondson, 2004; Nembhard and Edmondson, 2006). We suggest that CEO relational leadership, which refers to a leader who models relational behaviors by encouraging collaboration and open communication and promoting sincere behaviors (Carmeli et al., 2009), is a key for augmenting trust within the TMT, thereby facilitating learning from failures.

Leadership has long been seen as a relational construct, which implies that good leaders are able 'to work in and through relationships and to foster relational health in their organizations' (Fletcher, 2007: 348) as emphasized in theories such as Hollander's relational theory (Hollander, 1978), the leader–member exchange (LMX) perspective (Graen and Uhl-Bien, 1995), and the social identity theory of leadership (Van Knippenberg et al., 2004), as well as in more general perspectives such as social exchange theory (Blau, 1964), relational cognition theory (Berscheid, 1994; Fiske, 1992), social capital (Coleman, 1988), network theory (Burt, 1992), and more recently in the writings of organizational scholars on positive work relationships (Dutton, 2003; Dutton and Heaphy, 2003; Dutton and Ragins, 2007).

We posit that CEO relational leadership nurtures trust among TMT members. This is because CEOs who display relational leadership play a major role in building positive relationships between members (Fletcher, 2007). Through collaborations people get to know each other in a more intimate way; when members experience positive collaboration with each other they are more willing to expose themselves as they develop positive expectations of others' intentions and behaviors. In addition, when relational leaders encourage open communication TMT members feel psychologically safe to speak up and express their views freely (Edmondson, 1999, 2004). Thus, when members sense genuine openness in their interactions with each other they are more likely to accept vulnerability (Fletcher, 2004). Dutton (2003) noted that by being relationally attentive, leaders know how to cultivate connections, and that their willingness to convey openness and emotional accessibility builds a foundation for high-quality relationships. Similarly, Carmeli et al. (2009) showed that relational leaders play a key role in building and nurturing bonding social capital. Finally, relational leaders who promote sincere behaviors cultivate members' beliefs that others are reliable, thus engendering willingness to be vulnerable (Mishra, 1996) and a sense that they can rely on each other (Doney et al., 1998).

In addition, relational leaders sense changes in the relational dynamics between team members; these leaders notice factors affecting the connective tissue that relates team members (Dutton, 2003; Fletcher, 1999). When leaders signal sensitivity to the relational dynamics within the team, they create conditions for mutuality and trust (Dutton, 2003). This motivates TMT members to reciprocate and accept vulnerability, which is vital for facilitating a process of

reflecting and making sense of failed experiences. Further, CEOs who exhibit relational leadership provide support for expressing and tolerating conflicting opinions and feelings held by members, both of which are essential for learning from failures. The CEO thus has a key role in shaping norms that conflicting thoughts and feelings are legitimate and often essential for enabling the team to learn and move forward (Berg and Smith, 1995). Thus,

HYPOTHESIS 4: CEO relational leadership will be positively associated with TMT trust (trust among members of a TMT).

HYPOTHESIS 5: TMT trust (trust among members of a TMT) will mediate the relationship between relational leadership and TMT learning from failures.

Method

Sample and data collection

We sent a request to 500 alumni of executive MBA programs in Israel to help us access their firms' CEOs and TMT members to complete a structured questionnaire. In our letter, we explained that the questionnaire data were part of a larger research project on the role of leadership, team processes, and firm outcomes operating in diverse industries. To encourage participation, we promised that each participating firm would receive the findings of the research.

We followed previous research (Hambrick and Mason, 1984) to identify the 'direct reports', i.e., senior executives with whom the CEO shares the strategic decision-making process. Thus, the CEOs in our sample were asked to identify the TMT members they considered to be 'direct reports' and assist in recruiting them to participate in the study. We received responses from 81 firms' TMTs. However, following previous studies (e.g., Lubatkin et al., 2006), we excluded two firms for which fewer than 50% of the TMT members responded to our questionnaire, as well as two firms whose TMTs provided incomplete information. Thus, usable questionnaires were obtained only from 237 members – 77 CEOs and 160 senior executives who are members of their TMT. Overall, we received complete data from 15.4% of the targeted research population of TMTs.

The firms in the sample operated in diverse industries, including food and beverages, medical equipment and pharmaceuticals, computers (e.g., semiconductor and software), infrastructure and construction, and finance. There were no significant differences between the participating and non-participating firms in terms of size as measured by the number of employees ($p > .10$). Following Armstrong and Overton (1977), we also assessed potential response bias by comparing early with late respondents in terms of all key variables and did not find significant differences ($p > .10$).

Measures

As described below, most items in the questionnaires were originally developed by other researchers in English. Following conventional practice (Brislin, 1986), we translated the items into Hebrew and then back-translated them into English to ensure that the content was accurately represented in the Hebrew items. Prior to administering the questionnaire we asked 25 senior executives to review the items and indicate to us whether the questions were clear and reflected the constructs they were intended to measure. Following this procedure we made minor revisions to improve the clarity of certain items. To reduce potential common source bias, we collected data as follows: TMT members (excluding the CEO) provided data on CEO relational leadership; the CEO and the other TMT members provided data on TMT trust, TMT learning from failures, and strategic decision quality. In addition, the CEO provided data on past firm performance and TMT size.

CEO relational leadership. We adapted the three-item scale developed and validated by Carmeli et al. (2009) for assessing the extent to which a firm's CEO exhibits relational leadership behavior. We asked TMT members (i.e., direct reports) to assess on a five-point Likert scale (ranging from 1 = 'not at all' to 5 = 'to a large extent') the extent to which the firm's CEO: (1) encourages collaboration among TMT members; (2) cultivates a credible work environment in the TMT; and (3) encourages open communication among TMT members. The Cronbach alpha for this scale was .75, similar to the reliability reported in Carmeli et al.'s (2009) study.

TMT trust. To assess trust among team members, we adapted four items from Robinson's (1996) scale. Respondents (CEO and TMT members) were asked to report on the extent to which TMT members experience trust in their relationships with each other. The items were: (1) TMT members relate to each other with high sincerity; (2) members know that their colleagues on the TMT will treat them in a consistent and predictable fashion; (3) TMT members are not always honest and truthful with each other (reverse-scored item); and (4) TMT members are always open and up-front with each other. Responses were made on a five-point Likert-type scale ranging from 1 = 'not at all' to 5 = 'to a large extent'. The Cronbach alpha for this measure was .86, similar to the reliability reported in Robinson's (1996) study.

TMT learning from failures. To assess team learning from experiences of failures, we adapted three items from the scale used by Carmeli (2007) based on work by Tucker and Edmondson (2003). Respondents (CEO and TMT members) were asked to report on the extent to which the TMT engages in learning from failures. The items were: (1) when TMT members encounter a problem such as lacking sufficient resources to complete the task, they resolve it immediately and inform other TMT members about the problem; (2) when TMT members make a mistake, they inform the relevant TMT members so they can learn from it; and (3) when a TMT member makes an error, her/his TMT members will talk to her/him about it, not to blame but to learn and draw lessons from the event. Responses were made on a five-point Likert-type scale ranging from 1 = 'not at all' to 5 = 'to a large extent'. The Cronbach alpha for this measure was .73, slightly lower that the reliability reported in Carmeli's (2007) study.

Strategic decision quality. We used the three-item scale developed and validated by Amason (1996) to assess the quality of the strategic decisions made by the TMT. In line with previous research, data were collected from TMT members who are involved in the strategic decision-making process. The outcomes of strategic decisions are a function of the people who are actually involved in making them (Amason, 1996; Amason and Mooney, 2008). Thus, we asked the CEO and his/her TMT members to consider strategic choices (such as penetrating occupied or new markets, launching a competitive attack or responding to a rival's competitive attack, and choosing core capability, technology, and products to pursue) that they had most recently made and assess on a five-point Likert scale (ranging from 1 = 'very poor' to 5 = 'very good') the quality of the TMT strategic decisions in terms of their impact on the company. The items were: (1) the effect of the strategic decisions on the company have been . . . ; (2) relative to our expectations, the results of the strategic decisions have been . . . ; and (3) overall, the strategic decisions have been . . . . As in previous studies (Amason, 1996; Olson et al., 2007), we used perceptions for assessing strategic decision quality, which provide reliable measurements when objective data are not accessible (Dess and Robinson, 1984). The Cronbach alpha for this scale was .85.

Control variables. We controlled for TMT size and past firm performance. TMT size was measured by the number of TMT members (including the CEO and his/her direct reports). Research suggests

that TMT size may have an effect on TMT processes (Simsek et al., 2005) such as strategic decision-making. In addition, following previous studies (Elbanna and Child, 2007a), we controlled for the firms' past performance (for an average of two years prior to our survey period) because high-performance firms are likely to be associated with more quality strategic choices. We used the average of two-year gross, operational, and net income for assessing past firm performance, as reported by the firm's CEO.

Level of analysis. Relying on multiple respondents has been shown to be more reliable and less subject to superficiality than a single respondent in strategy research (Bowman and Ambrosini, 1997), though it requires the assessment of the consistency of responses within a team. Following previous research (e.g., James, 1982; Smith et al., 1994), we employed an analysis of variance to assess this consistency. The results showed greater variability in the ratings between teams than within teams ($p < .01$). We also calculated the intra-class correlations (ICCs) to assess group member agreement. ICC(1) indicated the extent of agreement among ratings from members of the same group. ICC(2) indicated whether groups could be differentiated based on the variables of interest. The values of ICC(1) and ICC(2) for the four measures for which we used multiple respondents were respectively as follows: .42 and .70 for CEO relational leadership; .48 and .85 for TMT trust; .29 and .71 for TMT learning from failures; and .48 and .85 for strategic decision quality. These values are consistent with the conventional standards for aggregating individual questionnaire responses into a team-level response (see Bliese, 2000).

Data analyses. Structural equation modeling (SEM) AMOS 18 was used to estimate the model. Because we had one CEO in one TMT in one organization/firm, rather than a nested design with multiple units within each organization, we used SEM analysis and not hierarchical linear modeling (HLM). In addition, the independent variable (IV) was at a lower level than the dependent variable (DV), such that HLM analysis was not feasible. We employed Anderson and Gerbing's (1988) two-step approach to SEM in which the first step is to assess the measurement model using confirmatory factor analysis, followed by a sequence of nested structural models. We calculated several goodness-of-fit indices to assess the fit of the research model. These indices included the chi-square statistic divided by the degrees of freedom (χ^2/d.f.), the comparative fit index (CFI), the Tucker–Lewis coefficient (TLI), and the root mean square error of approximation (RMSEA). Following Joreskog and Sorbom (1993) and Kline (1998), the following criteria of goodness-of-fit indices were used to assess the model fit: the χ2/d.f. ratio is recommended to be less than 3; the values of CFI and TLI are recommended to be greater than .90; RMSEA is recommended to be less than .05, and to be 'acceptable' if it is smaller than .08.

Results

Preliminary analyses

We first examined construct validity evidence for the measures. Using confirmatory factor analysis (CFA), we tested the hypothesized four-factor measurement model (see Figure 1) to assess whether each of the measurement items would load significantly onto the scales with which they were associated. The results of the overall CFA showed acceptable fit with the data. With a χ^2/d.f. = 1.98 (chi-square value of 128.65 with 65 degrees of freedom), the parsimony-adjusted goodness-of-fit statistics indicate an acceptable fit (CFI = .92; IFI = .92; TLI = .90; RMSEA = .07). Standardized coefficients from items to factors ranged from .50 to .93. In addition, the results for the CFA

indicated that all relationships between indicator variables and their corresponding latent variables were significant ($p < .01$).

Next, we tested three-factor models. First, we specified a three-factor model where the observed items of CEO relational leadership and TMT trust were loaded onto one latent factor and the observed items for both TMT learning from failures and strategic decision quality were each loaded onto two different latent factors. The results of this three-factor model generated fit indices indicating a poorer fit to the data: χ^2/d.f. = 3.40 (chi-square of 224.5 with 66 degrees of freedom); CFI = .70; IFI = .71; TLI = .59; RMSEA = .172.

We also tested a two-factor model where the observed items of CEO relational leadership, TMT trust, and TMT learning from failures were loaded onto one latent factor and the observed items of strategic decision quality were loaded onto a different latent factor. The results of this two-factor model also generated indices indicating a poorer fit than the four-factor model: χ^2/d.f. = 3.79 (chi-square of 254.1 with 67 degrees of freedom); CFI = .64; IFI = .66; TLI = .51; RMSEA = .188. Finally, a one-factor model was tested. In this model, all observed items were loaded onto the same latent variable. This model was expected to assess the extent of common method variance overall. The results of the one-factor model yielded the following relatively poor fit indices: χ^2/d.f. = 5.51 (chi-square of 374.9 with 68 degrees of freedom); CFI = .48; IFI = .50; TLI = .34; RMSEA = .21.

In sum, the three-factor, two-factor, and one-factor models exhibited a relatively poor fit compared to the hypothesized four-factor model.

The means, standard deviations, reliabilities, and correlations among the research variables are presented in Table 1. The bivariate correlations indicated that CEO relational leadership was positively related to TMT trust ($r = .37$, $p < .01$). TMT trust was positively associated with both TMT learning from failures ($r = .41$, $p < .01$), and strategic decision quality ($r = .32$, $p < .01$). We also found a positive relationship between TMT learning from failures and strategic decision quality ($r = .51$, $p < .01$). Finally, past firm performance was significantly related to strategic decision quality ($r = .36$, $p < .01$).

Model comparisons and hypothesis tests

Cheung and Lau (2008: 297–8) suggest that SEM has several advantages over the hierarchical regression approach in estimating models similar to ours. First, SEM is a better statistical tool to investigate latent variables with multiple indicators (Holmbeck, 1997). Second, measurement errors in the model can be controlled for when relationships among variables are examined, thus avoiding complications from measurement errors and the underestimation of mediation effects (Baron and Kenny, 1986; Hoyle and Smith, 1994). Third, the SEM can be used for the estimation and analysis of models with more than one mediator and one dependent variable (Hoyle and Smith, 1994). Furthermore, SEM provides a simple measure for comparing the goodness-of-fit of each model with that of alternative specifications (Cheung and Lau, 2008). In what follows, we present the results of the hypothesized mediating relationships through a series of nested models (see Table 2).

The results in Table 2 show that the baseline model fit the data reasonably well ($\chi^2 = 106.9$, d.f. = 86; CFI = .94; TLI = .92; IFI = .95; RMSEA = .055). All paths, except for those from the control variables to firm performance, were significant. We also tested three related models (Models 1, 2, and 3). Model 1 was identical to the baseline model, except that a direct path from CEO relational leadership to decision quality was added. The results in Table 2 show that Model 1 fit the data reasonably well ($\chi^2 = 105.5$, d.f. = 85; CFI = .94; TLI = .92; IFI = .95; RMSEA = .058; $\Delta\chi^2 = 1.4$, $p > .05$). However, whereas all specified paths outlined in the baseline model were

Table 1. Means, standard deviations (SD), and correlations.

	Mean	SD	1	2	3	4	5	6
TMT size	5.12	1.03	–					
Past firm performance	3.68	.68	−.06	–				
Relational leadership	4.16	.64	−.14	.17	(.75)			
TMT trust	3.97	.55	−.07	.09	.37**	(.85)		
TMT learning from failures	3.75	.60	−.08	.04	−.01	.41**	(.73)	
Strategic decision quality	3.94	.64	−.12	.36**	.23*	.32**	.51**	(.85)

Note: $N = 77$. Alpha reliabilities appear in parentheses.
* $p < .05$, ** $p < .01$.

statistically significant, the added path from CEO relational leadership to decision quality was not significant. Model 2 was identical to the baseline model, except that direct paths from CEO relational leadership to decision quality and from TMT trust to decision quality were added. Model 2 fit the data reasonably well ($\chi^2 = 104.5$, d.f. = 84; CFI = .94; TLI = .92; IFI = .95; RMSEA = .057; $\Delta\chi^2 = 2.4$, $p > .05$). However, neither of the paths was statistically significant. Model 3 was identical to the baseline model except that three direct paths were added: CEO relational leadership to decision quality, from TMT trust to decision quality, and from CEO relational leadership to TMT learning from failures. Model 3 fit the data reasonably well ($\chi^2 = 99.4$, d.f. = 83; CFI = .95; TLI = .93; IFI = .96; RMSEA = .051; $\Delta\chi^2 = 7.5$, $p > .05$). However, the additional paths were not statistically significant. Model 4 tested the direct paths from CEO relational leadership, TMT trust, and TMT learning from failures to strategic decision quality. Model 4 did not fit the data well ($\chi^2 = 142.3$, d.f. = 99; CFI = .87; TLI = .82; IFI = .88; RMSEA = .084).

The results of Models 1, 2, and 3 in Table 2 indicate that all of the estimated models fit the data relatively well. That is, the basic premise that (a) CEO relational leadership is positively related to TMT trust, (b) TMT trust is positively associated with TMT learning from failures, and (c) TMT learning from failures is associated with strategic decision quality, seem to be robust. Clearly, it is impossible to discriminate among these models on the basis of goodness-of-fit measures. However, all the specified paths were only statistically significant ($p > .05$) in the hypothesized model (baseline model). Thus, on the basis of the principle of model parsimony, we suggest, with the necessary caution, that the baseline model was marginally better than the other models for the data that we employed here. The baseline model is depicted in Figure 1.

Qualitative data

We conducted an in-depth qualitative analysis of two TMTs to deepen and extend our knowledge derived from the survey data. We were interested in gaining a better understanding of learning and strategic decision-making processes. We had no prior knowledge of the actual processes within these teams (i.e., how they approach to problems and failures, and learn from them). We learned that in one company, Alpha, there were many problems and dissatisfaction on the part of the board of directors with the situation and performance. In the other company, Beta, we learned that the founders were struggling to sustain a competitive position and that the CEO needed to build and cultivate relational connections that would enable a thorough examination of their problems and ways to improve strategic decisions. We visited the two firms at their headquarters facilities. At

Table 2. Comparisons and path coefficients of structural equation models.[a]

Model	Path coefficient / fit indices	Model	Path coefficient / fit indices	Model	Path coefficient / fit indices	Model	Path coefficient / fit indices	Model	Path coefficient / fit indices
Baseline model:		Model 1		Model 2		Model 3		Model 4	
CEO-RL→TTR	.45**	CEO-RL→TTR	.43**	CEO-RL→TTR	.43**	CEO-RL→TTR	.48**	CEO-RL→SDQ	.22, $p = .07$
TTR→TLM	.57**	TTR→TLM	.56**	TTR→TLM	.58**	TTR→TLM	.74**	TTR→SDQ	.01, $p = .90$
TLM→SDQ	.61**	TLM→SDQ	.58**	TLMS→DQ	.71**	TLM→SDQ	.57**	TLM→SDQ	.65**
		CEO-RL→SDQ	.15, $p = .24$	CEO-RL→SDQ	.23, $p = .10$	TTR→SDQ	.02, $p = .92$		
				TTR→SDQ	−.19, $p = .28$	CEO-RL→TLM	−.32, $p = .10$		
χ^2	106.9	χ^2	105.5	χ^2	104.5	χ^2	99.4	χ^2	142.3
d.f.	86	d.f.	85	d.f.	84	d.f.	83	d.f.	99
$\Delta\chi^2$		$\Delta\chi^2$	1.4	$\Delta\chi^2$	2.4	$\Delta\chi^2$	7.5	$\Delta\chi^2$	
RMSEA	.055	RMSEA	.058	RMSEA	.057	RMSEA	.051	RMSEA	.084
CFI	.94	CFI	.94	CFI	.94	CFI	.95	CFI	.87
TLI	.92	TLI	.92	TLI	.92	TLI	.93	TLI	.82
IFI	.95	IFI	.95	IFI	.95	IFI	.96	IFI	.88

[a] CEO-RL = CEO relational leadership; TTR = TMT trust; TLM = TMT learning from failures; SDQ = Strategic decision quality; PFP = Past firm performance.
In all models the control variable (TMT size) was linked to SDQ and TLM and PFP was linked to SDQ. Only PFP was significantly related to SDQ (see Figure 1).
* $p < .05$, ** $p < .01$.

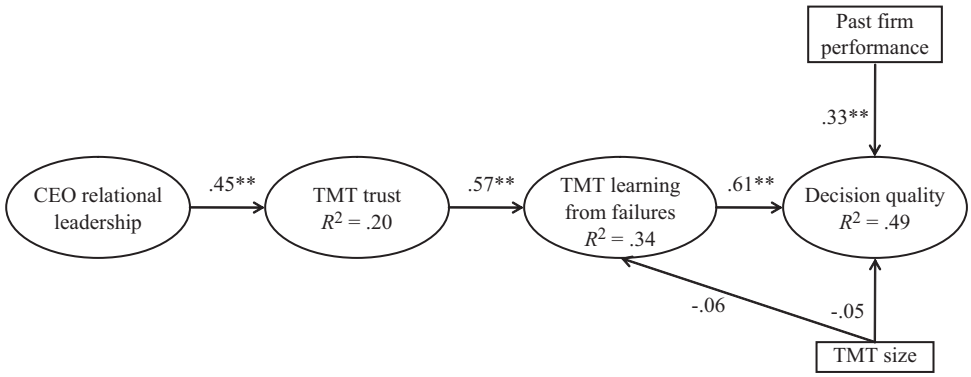

Figure 1. Results of the hypothesized research model.
Note. Ovals show variables. For clarity, the indicators (items) of all variables are not shown. Statistics are standardized coefficients.
$^{*}p < .05$, $^{**}p < .01$

Alpha, a bio-agricultural firm, we interviewed the CEO and four TMT members (VPs for finance, marketing, R&D, and HRM). At Beta, a software development company, we interviewed the CEO and two TMT members (VP for R&D and chief scientist). We also observed one TMT session at Beta. Each interview lasted between 45 and 90 minutes, with the exception of a more extensive interview with the CEO of Beta, conducted over two meetings of about two hours each. We began our interviews with general questions to learn about the structure and key milestones in the evolution of the firms. We then focused on exploring the dynamics in the TMTs and decision-making processes. For instance, we asked each interviewee to tell us about key strategic choices and the decision processes made by the TMT. We also asked questions about executive errors and the ways the TMT addressed them. This gave us a deeper understanding of the leadership, processes, and decisions at the TMT.

Alpha. Specializing in providing growers with sophisticated and advanced crop enhancement products, Alpha experienced a period of decline in both net income and profitability. The board lost faith in the CEO, and appointed a new one. Early in his tenure, the new CEO decided to work to create trust among the team members, and sought to promote open discussion and a collaborative mode of operation in the team. He organized a two-day workshop with TMT members to discuss the problems and challenges the company faced. During the workshop, it became clear that the team's relational and learning processes needed improvement. As the R&D director reported:

> Prior to [the new CEO, whom we refer to by a pseudonym] Eli's appointment, we didn't have a clue about what was really going to happen to the company . . . essential information was not shared with us . . . people become suspicious and this dictated their behaviors. . . . We didn't have meetings to discuss (problematic) issues. During the workshop and afterwards, things changed quite dramatically; openness, a sense of partnership, and trust were key elements in our work; when we had to make a decision about our innovation strategy we all got together to understand the weaknesses and problems of the current strategy, and developed a better understanding of the situation . . . eventually, after deliberating, we made a choice to pursue the more conservative path first, which proved very effective.

Eli understood that TMT members would be reluctant to discuss failures. To alleviate the lack of trust, he met with each member individually to discuss things in a more 'private' way, and also asked an independent consultant to organize a workshop on failures in other companies. This

process helped them engage in discussing their own failures, which became an ongoing practice, that helps, according to Eli, 'in expanding our knowledge and better utilizing it'.

Beta. The second company, referred to by the pseudonym Beta, develops advanced diagnostic medical devices in the healthcare sector. Beta was founded by two scientists to develop medical devices to help physicians improve early diagnostic capabilities in certain types of cancer. The CEO, whom we call David (also a pseudonym), was appointed after a majority shareholder was disappointed with the company's progress and outcomes. During this time, the founders felt that they were being pushed out of the loop. As David noted,

> This was my first concern when I joined the company . . . I devoted a lot of time to having open discussions and good communication between us, and this helped remove barriers by helping us learn to trust and respect each other's opinion and skills. . . . The first year was definitely a test for me as I had to show them that I could connect with them and lead the company successfully.

David also encouraged a customer-focus orientation. This was done through close interactions with clients to respond to their needs and resolve their problems. Following meetings with clients, TMT members would gather together to discuss gaps and issues that needed to be addressed. As the chief scientist recalled:

> We found a critical bug in our system just a week before an important presentation and demonstration in front of a major firm in the field; I could express my opinion freely and suggest, like everyone else, my views and the path I recommended to pursue. . . . I can say that there was no blaming but instead a collective effort to understand what went wrong and solve it.

In our interviews, all the TMT members mentioned a specific failure that put a major project developed in the firm in jeopardy. When a letter from the authorities was received at Beta's offices informing the TMT that the system had not received approval, David immediately gathered all of the senior managers together in an attempt to understand what exactly had not been done as required by the authorities:

> We could have put the blame on each other; instead, we reviewed the entire document thoroughly and discussed each comment extensively. . . . Using brainstorming together with collective effort by everyone we were able to respond to all the comments and resubmit the system for approval.

In a similar vein, the company had to make a critical choice regarding the development of a new product (related to a different line) that would resolve a major problem in the software. The TMT had several meetings in which the problems and failures were analyzed, and despite substantial constraints (budget, experience), the team members decided to develop the new product to tackle the existing problem in the software. Once the decision was made, science and R&D unit members felt committed to the decision and through intensive work successfully developed the new product and addressed the problem. This success allowed Beta to provide clients with a superior product that proved lucrative.

Both cases illustrate how TMTs can use failure to improve the quality of their decisions, and both highlight the role of relational leadership and a climate of trust in the team, to make discussing failure feasible and valuable. These vignettes simply illustrate *how* the relationships tested by quantitative survey data might play out in real TMTs. In both cases, the CEOs joined their companies in uncomfortable situations and were able to shape the psychosocial conditions in their teams

to be conducive to learning from failures. These leadership efforts helped to improve the strategic decision-making process and outcomes in both of the TMTs.

Discussion

In this article, we examined the role of two factors, CEO relational leadership and TMT trust, in facilitating learning from failures and improved strategic decisions in TMTs. The results of structural equation modeling (SEM) support our research model. We found that (1) the relationship between CEO relational leadership and team learning from failures was mediated by trust among TMT members; (2) team learning from failures mediated the relationship between team trust and strategic decision quality; and (3) past firm performance had a significant positive effect on strategic decision quality. In short, the results of the SEM analyses indicated a two-stage mediation model in which CEO relational leadership was positively related to team trust, which, in turn, increased team learning from failures. The latter was positively associated with strategic decision quality. Consistent with other research (Edmondson, 1999; Edmondson and McManus, 2007), we used qualitative data to help build confidence in our constructs and arguments by illustrating the interrelated phenomena specified in the research model and tested with quantitative survey data. In what follows, we discuss the implications of these findings for theory and research.

Theoretical implications

This study contributes to the growing body of work on new and diverse types of teams. Early team research tended to treat teams as a homogeneous construct, without substantive differences based on their task or context. More recent work has started to take context and type seriously by developing more nuanced models of team learning and team performance (e.g., see Edmondson et al., 2007 for a review). Our arguments and findings pertain to TMTs, rather than to all teams, because of the nature of the work these teams do. The role of prior firm or team failure is especially relevant. We argue that the theme of failure has a central place in the study of senior executive teams, because of both the complexity of the work and the level of collective and individual responsibility held by team members. Failures may be inevitable in TMTs, but learning from them is not. Our data provide suggestive evidence that when senior leadership teams invest attention in learning from failure, the quality of their strategic decision-making will improve.

Second, this study contributes to upper echelon research by showing that TMTs that engage in learning from experiences of failure can improve their strategic decisions. Thus a TMT can improve its performance over time; its composition is not its destiny. TMTs can be seen as interpretation systems (Daft and Weick, 1984) that collect and interpret information critical for making strategic choices and moves (Hambrick et al., 1996). Our study sheds light on why some TMTs may be more effective than others in strategic decision-making (Eisenhardt, 1989, 1999), especially if they attend to learning from failures. This is an essential skill for TMTs, particularly considering the findings of a recent qualitative and quantitative study suggesting that the majority of senior teams across sectors and contexts are not effective (Wageman et al., 2008). We argue that learning from failures is an important mechanism for enabling a TMT to make better strategic decisions in the future. It allows a TMT to draw on its past experiences to make better decisions by alleviating the tendency to persist with prior choices (Day and Lord, 1992; Lant et al., 1992; Milliken and Lant, 1991; Walsh, 1995). This is a sensemaking mechanism. Because our actions often outpace our understanding of actions, we must actively make sense of both actions and events to make effective

choices (Weick, 1988). This study suggests that TMTs reflect upon their experiences to gain a fuller understanding of what, why and how things went wrong; through this process teams become more vigilant and capable of noticing weak signals that often slipped under the system's radar (Weick and Sutcliffe, 2001). Reflexivity is a key enabler of information processing through which a better understanding of emergent situations is facilitated. In this way, our research enriches knowledge by casting learning from failures as a critical mechanism underpinning effective strategic decision-making. It facilitates more effective team dynamics and behavioral processes (Finkelstein and Hambrick, 1996; Kozlowski and Bell, 2008), particularly when much is at stake (Edmondson and Moingeon, 1998). Hence, dealing effectively with failure is essential in complex and uncertain contexts (Edmondson, 2011).

Overall, our study contributes to a better understanding of the role of CEOs in shaping the dynamics of their teams (Peterson et al., 2003). Our research sheds further light on the role of leadership that is relationally sensitive, and emphasizes the need for leaders to work with other team members to design and shape relational practices (Carmeli et al., 2009; Fletcher, 2007; Hirak et al., in press). Such practices are essential to learning from failed experiences, as a way of improving strategic choices. Trusting relationships among TMT members can facilitate learning processes, and thereby build a stock of collective knowledge in a team.

Limitations and future research directions

Although this research constitutes one of the first attempts to investigate a key factor in helping CEOs and TMTs improve the quality of strategic decisions – learning from failures – several limitations must be noted. Caution is required when attempting to overgeneralize the findings of this research to other contexts because our study involved Israeli organizations, many of them privately held. Future cross-cultural studies on TMTs thus may prove useful in extending and validating our theoretical model.

Our model results should also be interpreted with caution. Parsimony is not the only criterion for determining a mediation model. In fact, goodness-of-fit indices are often used to assess which model fits the data better. However, our qualitative data provide some idiosyncratic insights into the proposed mediation model. Nonetheless, we encourage sensitivity to subtle interpretations of our results and call for future research to examine such mediation models.

Caution must also be exercised with respect to conclusions drawn from survey data, particularly in making causal inferences. It would be useful to conduct a longitudinal study that tracks the dynamic nature of the interrelationships between leadership actions, team processes and decision outcomes. As a crude test for the appropriateness of the proposed model in connecting the four variables that we use here (i.e., CEO relational leadership, TMT trust, learning from failures, and strategic decision quality), we estimated several alternative models with different causal structures. We tested, for example, whether firms that performed well in the past showed a stronger connection between trust and relational leadership, and found that the interactive effect was not significant ($p > .10$). While these tests do not prove that our model exhibits the 'true' causal relationships, their results are consistent with our argument that the model reflects a more sensible fit than alternative models.

Another limitation involves common method bias from our reliance on team member survey reports of the core constructs in this study. We attempted to mitigate this bias by collecting data from both CEO and TMT members, as well as by performing post hoc tests to evaluate the severity of the problem in this study. Some confidence derives from the fact that our data were collected from multiple respondents and we separated the data to measure CEO relational leadership and team constructs. In addition, when we used a random process for separating the responses

(Podsakoff et al., 2003), the results provided further support for the hypothesized model. Second, although a crude test, we ran a confirmatory factor analysis (CFA) on all items constituting the research measures in the model. The results of this analysis provided no indication of a dominant factor. Specifically, results of the CFA showed that our hypothesized four-factor model had a better fit to the data than a one-factor, a two-factor, or a three-factor model structure. We then took two additional steps to provide the most reliable possible measure of past firm performance; specifically, we used the average of two-year gross, operational, and net income for assessing past firm performance, as reported by the firm's CEO (these data were compared and verified vis-a-vis the CFO reports, though we eventually used CEO reports to alleviate common method error concerns). We were able to collect objective data on the performance of a subsample of 24 firms. Specifically, we obtained data on return on assets (ROA) and return on sales (ROS). In this subsample, CEO perceptions of growth in net sales were positively and significantly related to ROS ($r = .45$, $p < .05$), and CEO perceptions of operational effectiveness were positively and significantly correlated with ROA ($r = .43$, $p < .05$). These external data increased our confidence in the performance data reported by the companies for this study. Clearly, future research is needed to further develop this line of reasoning, such as by obtaining data on the quality of a firm's strategic decisions from experts who analyze them.

In sum, we do not yet know enough about how relational leadership emerges, or about the conditions under which it is likely to have the most influence. CEO leadership style can vary widely, and further research is needed to understand these effects, and how they can improve strategic decision-making processes and outcomes. We focused on learning from direct prior (failed) experiences, but it may be useful to examine the influence of additional learning processes (i.e., vicarious and contextual learning) (Bresman, 2010) and both direct and indirect learning processes (Kim and Miner, 2007) on the quality of strategic choices made by the TMT. Finally, we dealt with a global measure of strategic decisions rather than examining specific choices. An in-depth analysis of TMTs over a long period of time would no doubt provide insights into the CEO pathway effects on TMT processes and strategic decisions.

Conclusion

This study highlights the importance of CEO relational leadership in facilitating learning from failures in TMTs to improve strategic decisions. We predicted and found evidence to support a model in which CEOs who display relational leadership help cultivate trust among TMT members and facilitate learning from experiences of failure, thereby improving the quality of strategic decisions. Our study sheds light on how CEO relational leadership shapes conditions (trust within the TMT) and facilitates processes (TMT learning from failures) conducive to improved strategic decisions. Following Corley and Gioia (2011), we hope that our work provides transformative thinking about the ways CEOs can improve TMT strategic decisions by exhibiting relational leadership and creating trust, a psychological condition conducive to learning from experiences of failure.

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Author biographies

Abraham Carmeli is a professor of strategy and management at Tel Aviv University, Faculty of Management. He received his PhD from the University of Haifa. His current research interests include leadership and top management teams, strategic decision-making processes, decline and failures in organizations, positive work relationships, knowledge creation, and integration and creativity and innovative behaviors. *Address*: Faculty of Management, Tel Aviv University, Ramat-Aviv, Tel Aviv 69978, Israel. [email: avic@post.tau.ac.il]

Asher Tishler received his BA in Economics and Statistics from the Hebrew University of Jerusalem, and his PhD in Economics from the University of Pennsylvania. He has been affiliated with the Faculty of Management at Tel Aviv University since 1976. Currently he is the Dean of the Faculty of Management at Tel Aviv University and the Director of the Institute of Technology and Society and the Eli Hurvitz Institute of Strategic Management. His main research interests are applied microeconomics, strategy, models of research and development, multivariate statistics, energy economics, and defense-related issues. *Address:* Faculty of Management, Tel Aviv University, Tel Aviv, Israel. [email: atishler@post.tau.ac.il]

Amy C. Edmondson is Novartis Professor of Leadership and Management at Harvard Business School. She received her PhD in Organizational Behavior from Harvard University. Her research examines leadership and interpersonal interactions that enable organizational learning in hospitals and other complex operations. *Address:* Harvard Business School, Boston, MA 02163, USA. [email: aedmondson@hbs.edu]