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Cultivating a resilient top management team: The importance of relational connections and strategic decision comprehensiveness

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ABSTRACT

Despite growing research interest in both top management team (TMT) processes and resilience in organizations, these two streams of research have remained largely separate, let alone fully developed. In this study, we examine whether and why relational connections marked by connectivity facilitate strategic decision comprehensiveness, and cultivate two forms of TMT resilience that capture both efficacious beliefs and adaptive capacity. Based on a sample of 74 TMTs, the findings of this study indicate that (1) connectivity is positively related to strategic decision comprehensiveness, (2) strategic decision comprehensiveness is positively associated with both forms of TMT resilience, and (3) connectivity is indirectly, through strategic decision comprehensiveness, related to both TMT resilience–efficacious beliefs and TMT resilience–adaptive capacity. These findings have direct implications for research on TMTs, decision-making processes, and resilience by specifying the ways in which relational connections help build capacities in senior executive teams.

"*It's how you deal with failure that determines how you achieve success*"

David Feherty, former professional golfer and CBS Broadcaster

1. Introduction

Resilience, which is defined as "the capacity to rebound from adversity strengthened and more resourceful" (Sutcliffe and Vogus, 2003, p. 97), is fundamental to human and organizational functioning and viability. Coping and bouncing back from experiences of failure and adversity may also be important for organizational crisis-preparedness, high reliability, longevity and future growth (Carmeli and Markman, 2011; Carmeli and Schaubroeck, 2008; Weick and Sutcliffe, 2001). Resilience is also a key capacity that is related to safety processes and outcomes in various settings (Amalberti, 2006; Morel et al., 2009). Woods and Hollnagel (2006) pointed to the need to adopt a proactive approach to safety management that recognizes the complexity and ever-changing environment. This approach requires constant investments in "anticipating the changing potential for failure because they (organizations) appreciate that their knowledge of the gaps (is) imperfect and that their environment constantly changes" (Woods and Hollnagel, 2006, p. 6).

Resilience as a capacity for positive response and healing capabilities from setbacks has also attracted considerable research attention in health and psychology (Bonanno, 2004; Fergus and Zimmerman, 2005; Flach, 1997), and organization and management studies (Dutton et al., 2006; Lilius et al., 2011; Powley, 2009; Waldman et al., 2011). The concept of resilience emerged from the understanding that "failures are breakdowns in the normal adaptive processes necessary to cope with the complexity of the real world, and that success relates to organizations, groups and individuals who produce resilient systems that recognize and adapt to variations, changes and surprises (Rasmussen et al., 1994; Cook et al., 2000; Woods and Shattuck, 2000; Sutcliffe and Vogus, 2003)" (Patterson et al., 2007, p. 155). However, this line of research has often focused at the individual level, and despite increased efforts this body of knowledge has yet to be fully developed. Specifically, further research is needed to deepen our understanding of team resilience and the processes that help build this capacity. This relatively understudied area is particularly important in the context of top management teams (TMTs) that often face times of difficulty such as declining outcomes, experiences of failure, and upheavals. Understanding why some TMTs are more able than others to cope with the significant challenges of economic hardships (e.g., recession) and demanding competitive pressures (e.g., rapid technological advances) is a research area that is in a nascent stage.

TMT members are individually and collectively accountable for the strategic orientation and functionality of their organization. However, research has noted that many TMTs experience maladap-

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tation (Hambrick, 1998), and often make poor choices that negatively affect the organization (Carmeli and Schaubroeck, 2006). In addition, research indicates that internal TMT processes may play a key role in explaining adaptive and maladaptive organizational responses to change (Hambrick, 1998; Mooney and Sonnenfeld, 2001; Simsek et al., 2005). Work team processes have attracted considerable research attention, and have focused on various constructs such as cohesion and attention to political feasibility that describe the interactions between members (Eden and Ackerman, 2001; Kozlowski and Bell, 2003, 2008; Mathieu et al., 2008). This interest derives from the acknowledgement that "processes are important because they describe how team inputs are transformed into outcomes" (Mathieu et al., 2008, p. 412). Similarly, the study of TMTs aims to understand processes and outcomes and has become an increasingly prominent topic of inquiry (Hambrick, 2005). TMT processes provide meaningful intervening constructs (Jarzabkowski and Searle, 2004) that help unpack the 'black box' of inconsistent demographic research findings (Hambrick, 1994; Lawrence, 1997). This line of research has produced useful knowledge about processes within TMTs that enable different strategic orientations, improve strategic choices, and enhance firm performance (Barrick et al., 2007; Li and Hambrick, 2005; Lubatkin et al., 2006; Pettigrew, 1992; Smith et al., 1994). However, although studying TMT processes can provide significant input to refine Upper Echelon Theory (Hambrick, 2005), this body of knowledge has yet to be fully exploited (Barrick et al., 2007; Hambrick, 2005; Lubatkin et al., 2006). Further, research on TMT processes and resilience has largely remained disparate, and we have yet to see studies that examine whether and how TMT processes can help build and cultivate collective resilience.

This study aims to contribute to this emerging literature by examining whether connectivity between TMT members facilitates a higher level of engagement in strategic decision comprehensiveness and enhances TMT resilience. We further draw on recent literature on high quality relationships (Dutton, 2003; Dutton and Heaphy, 2003; Ragins and Dutton, 2007) to investigate how relational connections marked by connectivity between TMT members help cultivate TMT resilience, thus contributing to a better understanding of the relational and strategic decision making pathways for building team capacities. Connectivity is a relational construct that characterizes the structural ties between members and is manifested in openness (it enables people to embrace diverse influences that come from others as opportunities for learning and growth) and generativity (a relationship between members which is manifested in enhanced possibilities for learning new things, seeing new opportunities, and generating new insights) (Carmeli and Spreitzer, 2009; Dutton and Heaphy, 2003; Dutton and Sonenshein, 2009; Losada and Heaphy, 2004). Thus, we reason that connectivity may be a key mechanism because it enables the team to see opportunities in times of difficulty and generate new insights that can augment the capacity to bounce back from negative events strengthened and more resourceful.

Nevertheless, a critical factor in TMT resilience is a team's grasp of the situation and issues it faces. For instance, Chakravarthy (1982) suggested the concept of adaptive fit to describe a system that is able to sense complexity in an environment. Similarly, Lengnick-Hall and Beck (2005) defined the capacity for resilience as the "ability to interpret unfamiliar situations; to devise new ways of confronting these events; and to mobilize people, resources, and processes to transform these choices into reality (Kobasa et al., 1985, p. 752)". Thus, a TMT needs to engage in strategic decisions in a more comprehensive manner to enhance its resilience and cope with adversity successfully. In other words, the extent to which TMTs "attempt to be exhaustive or inclusive in making and integrating strategic decisions" (Fredrickson and Mitchell, 1984, p. 402) is crucial to making the right choices that can enable the team to recover from a setback.

We also suggest that connectivity facilitates the engagement of TMT members in decision comprehensiveness. This is because connectivity in relationships enables TMT members to feel psychologically safe to discuss the strategic issues at hand (see Edmondson, 1999, 2003), thus alleviating concerns that may lead members to become defensive and less inclined to discuss major issues openly, which can inhibit cognitive processes of seeing and capitalizing on opportunities. This kind of connection between TMT members also helps them to interact and interrelate in such a way that they do not dismiss or oversimplify issues, but rather carefully consider them in a more mindful manner when making strategic choices.

In testing these relationships, we hope to contribute to the scant literature on TMT resilience by expanding our knowledge about TMT processes while drawing on the theory of high quality relationships in the workplace. In so doing, this study addresses the call to unravel relational and strategic decision making processes that help build capabilities. Further, we provide a first examination of whether the way TMT members connect facilitates engagement in strategic decision comprehensiveness and why the latter may enhance team resilience, which is crucial for effective navigation in turmoil and in uncertain environments that pose various strategic and organizational challenges.

2. Theoretical background and hypotheses

2.1. TMT resilience – defined

Previous work defines resilience as the ability of individuals, groups, or organizations to absorb strain, preserve and improve functioning while encountering both external and internal forms of adversity, and at the same time recover from untoward events and become more strengthened (Sutcliffe and Vogus, 2003). However, in this study we present a more nuanced conceptualization of resilience. We conceptualize resilience as a two-dimensional construct that is manifested by efficacious beliefs of coping with the difficulty and the capacity to adapt.

The first dimension of this concept refers to beliefs that the team or system has the ability to cope with the difficulty. We label this as *resilience–efficacious beliefs*. Efficacy does not refer to actual capability, but to the beliefs which group members have about their capacity to successfully perform particular tasks (Bandura, 1997). Just as general efficacy differs from resilience (Sutcliffe and Vogus, 2003), specific team efficacy for resilience, as defined and operationalized here, captures the social cognitive beliefs that the team is able to absorb and cope with strain.

However, resilience also requires the capacity for adaptability and positive adjustment in the face of difficulty (Carver, 1998; Masten and Reed, 2002; Sutcliffe and Vogus, 2003). We label this second dimension the *resilience–adaptive capacity*. Drawing on previous research (Lengnick-Hall and Beck, 2005; Chakravarthy, 1982), resilience as an adaptive capacity refers to the ability to sense, interpret, and respond to complexities such that problems are noticed, and capitalized onto cultivate a work system that is capable of adjusting to setbacks and continues to grow. Resilience differs from strategic fit in that the latter refers to elements in a system which are consistent or inconsistent (i.e., present a misfit) with other elements in the system (e.g., policies, activities, resources) (Nadler and Tushman, 1980; Siggelkow, 2002; Zajac et al., 2000), but does not explicitly specify the ways organizations recover from setbacks. Thus, we conceptualize resilience as a team's belief that it can absorb and cope with strain, as well as a team's capacity to cope, recover and adjust positively to difficulties.

2.2. Strategic decision comprehensiveness and TMT resilience

Utilizing decision making comprehensiveness indicates that a TMT is engaged in thorough and inclusive practices when confronting strategic issues (Fredrickson and Mitchell, 1984). Decision comprehensiveness underpins the systematic collection and processing of information from the competitive environment (Fredrickson, 1984; Glick et al., 1993), through meticulously examining and evaluating a given situation (Dean and Sharfman, 1993). This exhaustive systematic information processing helps to reduce the level of uncertainty inherent in any strategic decision making process (Christensen and Fjermestad, 1997; Egelhoff, 1991), improve decision quality, and enhance organizational outcomes (Atuahene-Gima and Li, 2004). Eisenhardt (1999) reported that one of the key differences between less and more effective senior executives is that effective management groups act as a team and their members use more information, rely on more extensive information, and favor collaboration over competitiveness. This is evident in research showing that those TMTs that are more strategically comprehensive avoid one of the major pitfalls of the decision-making process, namely the trap of the "limited search" (Nutt, 2004). However, little is known about whether strategic decision comprehensiveness cultivates TMT resilience. In what follows we provide several explanations for why strategic decision comprehensiveness is likely to nurture TMT resilience.

First, we suggest that strategic decision comprehensiveness is likely to lead to better understanding of a given situation, as well as improving preparedness for unexpected strain and hardships. It is vital to acquire a good understanding of a situation to enhance the capacity to cope with the difficulty. This is consistent with Woods' (2005) suggestion that more profound knowledge can be developed when a "quasi-independent group" bridges the gaps between organizational units and develops a "complete and coherent view of the event" (p. 299). Mintzberg et al. (1976) noted that decision-makers usually start out with poor comprehension of a business situation and that their understanding deepens as they gradually work on the problem. Janis and Mann (1977) characterized a comprehensive decision making process as a multifaceted construct involving numerous necessary stages including evaluating objectives while weighing their costs and consequences and ultimately making detailed plans including explicit consideration of contingencies. Senior executives who gathered extensive information before making strategic choices had a more accurate picture of which forces shape and affect situations (Dean and Sharfman, 1993). In addition, utilizing extensive information is likely to mitigate cognitive biases such as confirmation bias, sunk cost bias, and focusing bias (Miller, 2008). By curbing these decision biases, a comprehensive decision process allows senior management to better understand a situation, its sources, and the potential consequences of a given response or course of action. When TMTs have a better grasp of a situation, they are better equipped to exploit their cognitive repertoire to manage difficulties effectively. One of the differences is that more resilient teams are likely to view adversities as challenges whereas less resilient teams tend to perceive them as threats; this difference is significant as it determines the way a TMT is likely to approach issues, policies and courses of actions. Strategic decision comprehensiveness enables a TMT to locate and identify signals that have the potential to generate a crisis, deepen its understanding of events as they emerge and the challenges these situations pose, thus allowing senior executives to determine which response should be adopted, why, and how it should be implemented. Compared to less resilient teams, teams with a high level of resilience are likely to come up with more flexible and adaptive responses to adversity. Arguably, decision comprehensiveness may be linked with planning, which may limit the organization's ability to bounce back quickly by contrast to a more improvisational approach. Nevertheless, comprehensiveness remains a key to fully grasping a situation and its underlying factors. We claim that when a team is comprehensive in its decision making process its members acquire a deep understanding of the event (why it emerged and how), and thus often respond more effectively.

Second, following research on high-reliability organizations (Weick and Sutcliffe, 2001), we argue that mindful teams that encounter difficult times are more capable of coping and adapting, and are thus able to manage the unexpected more effectively, compared to less mindful teams. Mindful teams are actively engaged in the present: they notice new things and are sensitive to context (Langer and Moldoveanu, 2000; Weick et al., 1999). Resilient teams are likely to be more mindfully attentive to work processes by engaging in learning from failure (Weick and Sutcliffe, 2001; Weick et al., 1999), which is not only essential for reducing and decreasing accidents and failures (Baum and Ingram, 1998; Haunschild and Sullivan, 2002), but also for improving system reliability (Weick and Sutcliffe, 2001) and crisis-preparedness (Carmeli and Schaubroeck, 2008; Nystrom and Starbuck, 1984). Sutcliffe and Vogus (2003) emphasized the connection between learning and resilience while highlighting organizational adaptability to stress and challenges, and argued that learning from experience enables adaptability to future challenges. Carmeli and Schaubroeck (2008) noted that when engaging in learning from experiences of failure, work systems are better at coping with adversity and more prepared to manage situations of crisis. Farjoun's (2005) study pointed out that NASA missed opportunities to learn from similar problems, pointing to lessons from the 1999 failure of two robotic Mars probes that "had not been fully internalized" (p. 75).

Gittell et al. (2006) found that the ability to respond to crisis stems from comprehensive preparation, which often depends on the social fabric within a system. Hamel and Välikangas (2003) indicated that seeking alternatives, an awareness of the environment, and cognitive consciousness are essential to identify trends, adjust and ultimately rebound from a setback. Finally, Gulati (2010) showed that resilient systems thrive through vigilant analysis of customers, in particular by engrossing themselves in their inner problems. Thus, carefully attending to environmental issues when making and integrating strategic decisions (Atuahene-Gima and Li, 2004; Fredrickson, 1984; Fredrickson and Mitchell, 1984; Lindblom, 1959), avoiding oversimplification, and thoroughly evaluating a situation (Weick and Sutcliffe, 2001) enhance a TMT's capacity to withstand setbacks and rebound from and adjust positively in the face of adversity. On the basis of this reasoning, the following hypothesis is formulated:

Hypothesis 1. Strategic decision comprehensiveness is positively related to both TMT resilience–efficacious beliefs and TMT resilience–adaptive capacity.

2.3. Connectivity, strategic decision comprehensiveness and resilience

Relational connections between people can have a powerful impact on their engagement in particular processes and behaviors (Kahn, 2001, 2007a, 2007b). In addition, interpersonal processes manifest quality and effective teamwork. We suggest that connectivity is an important relational mechanism that enables group members to appreciate diversity and see heterogeneous influences and demands not as threats but rather as opportunities to explore, learn from, adapt and nurture sustainable growth. Connectivity differs from other constructs of TMT processes such as cohesion (Barrick et al., 2007) and behavioral integration (Hambrick, 1994) in that cohesion and behavioral integration refer to the type of

interaction and bonding between members whereas connectivity is a structural tie which refers to the nature of the connection.

Research on connectivity in teams is relatively scarce. One exception is Losada and Heaphy's (2004) study of management teams in strategic business units (SBUs) that sheds light on the power of connectivity in explaining variation in team performance. Their findings indicate that a high level of connectivity is associated with high performance. This is because people who have high-quality connections are able to interact with each other more frequently and in such a way that generates a higher positivity/negativity (P/N) ratio, which Losada and colleagues found to be a critical parameter in determining what kinds of dynamics are possible for a team. This P/N ratio is vital as it determines the types of intra-team dynamics. When the relational dynamics between group members are marked by connectivity, the expansive emotional space (where more possibilities for action are available) generated by high P/N ratios helps them to see possibilities for action. In addition, the strength and quantity of the connections (nexi or ties) is why connectivity in relationships is indicative of an expansive emotional space with durable psychological and social resources (Losada and Heaphy, 2004, p. 760). This is in line with Fredrickson's (2001) broaden-and-build theory which suggests that when people experience positive emotions, they broaden their thought-action repertoires and also build resources that enable them to cope and manage things more effectively than others who lack them. Further, Tugade and Fredrickson (2004) showed that individuals use positive emotions to bounce back from negative psychological experiences. Cameron et al. (2011) recent research underscores the importance of the amplifying and buffering effects of positive practices. For example, quality relationships among members are formed through social capital where information and resources flow to facilitate resilience. Similar patterns occur when positive practices also buffer the organization from the negative effects of trauma or distress by cultivating resilience, as well as through the heliotropic effect, the basic tendency toward positive energy, such that positive practices shape positive norms vital for collective survival (Cameron et al., 2011).

Following this line of theory and research, we suggest that when TMT members are in a relational connection which is marked by connectivity, they are able to engage in decision comprehensiveness and cultivate team resilience. Specifically, drawing on Losada's (1999) research we argue that connectivity facilitates meta-learning through strategic decision comprehensiveness. Meta-learning is defined as the "ability of a team to dissolve attractors (i.e., simpler dynamics) that close possibilities for effective action and to evolve attractors that open possibilities for effective action" (Losada, 1999, p. 190). Connectivity facilitates meta-learning that enables team members to transcend the limiting attractors and reach the dynamics of complexors (i.e., complex orders which are dynamic, flexible, innovative). As such, connectivity allows the team "to respond adaptively and innovatively to continuously changing and challenging environmental demands" (Losada and Heaphy, 2004, p. 751).

Connectivity means that the connection between people is characterized by a high level of openness and generativity (where new things can be learned, new opportunities can be realized, and new insights can originate). This allows the team to thoroughly process information and make sense of emergent issues and see opportunities for effective courses of actions, thus increasing the capacity to rebound from adversity successfully. Broad information processing is essential for cultivating resilience (Sutcliffe and Vogus, 2003). For instance, Kavanagh (2009) examined resilience in a governmental context and concluded that engagement in planning, identification and confirmation of critical issues through a systematic analysis of information are all vital for resilience. Powley (2009) indicated that relational processes are fundamental in activating resilience, which constitutes a healing process after trauma. Finally, it is suggested here that by facilitating decision comprehensiveness, connectivity is likely to be more adaptive to continuous environmental jolts when it can absorb both order and disorder (see Brown and Eisenhardt, 1997, p. 29). Thus, the following hypotheses are suggested:

Hypothesis 2. Connectivity is positively associated with strategic decision comprehensiveness.

Hypothesis 3. The relationship between connectivity and both TMT resilience–efficacious beliefs and TMT resilience–adaptive capacity is mediated by strategic decision comprehensiveness.

3. Method

3.1. Sample and data collection

As part of a large research project, we accessed 500 firms' TMTs. We sent a letter with a request to facilitate access to their firms' CEOs and TMT members, to ask them to complete a structured questionnaire. In our letter, we explained that the research project focused on processes in senior management teams and firm outcomes operating in diverse industries. To encourage participation, we committed to delivering the findings of the study to each participating firm upon request.

We followed previous research (Hambrick and Mason, 1984) to identify the senior executives constituting the TMT; i.e., senior executives with whom the CEO shares the strategic decision-making process. Thus, we asked the CEOs in our sample to identify TMT members and assist in asking them to participate in the study. Usable data were collected from 74 TMTs, representing a response rate of 14.8%. Usable questionnaires were obtained from 228 members – 74 CEOs plus 154 senior executives who were members of their TMT. Following previous studies (e.g., Lubatkin et al., 2006), we excluded seven firms for which fewer than 50% of the TMT members completed the questionnaire, as well as firms' TMTs that provided incomplete information. Overall, we obtained data from at least three members in each TMT; the average size was 5.12. We examined and found no significant differences between the participating and non-participating firms in terms of size as measured by the number of employees ($p > .10$). In addition, following Armstrong and Overton (1977) we assessed potential response bias by comparing early with late respondents in terms of all key variables and did not find significant differences ($p > .10$).

The firms in the sample operated in diverse industries, including food and beverages, medical equipment and pharmaceuticals, computers (e.g., semiconductor and software), infrastructure, construction, and finance.

3.2. Measures

Most of the items in the questionnaires were originally developed by other authors in English (see below). We followed Brislin's (1986) guidelines for translation and back-translation to ensure construct measurement validation. We sought to further validate our survey by asking 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. This procedure resulted in a few minor revisions that improved the clarity of certain items. The data were collected from both CEO and TMT members about connectivity, strategic decision comprehensiveness and resilience. In addition, they provided data on industry conditions, and the CEO provided additional data on industry type, TMT size, and tenure.

3.2.1. TMT resilience

We constructed six items to constitute the two dimensions of team resilience. Based on Chen et al. (2001) general self-efficacy scale we used three items to assess resilience efficacious beliefs. The items are: (1) "When encountering a new and difficult task, we are certain we can do it successfully;" (2) "We will be able to successfully overcome many new challenges that face us;" and (3) "Even when the situation is challenging, we can do what is necessary rather successfully." Three items were constructed to assess resilience as an adaptive capacity. We adapted the following three reverse-scored items based on Carmeli and colleagues (Carmeli et al., 2010; Carmeli and Sheaffer, 2008): (1) "We do not make the necessary changes and adaptations to respond effectively to changes in the industry" (reverse-scored item); (2) "We stick to our old ways and do not adjust to the changing circumstances in our industry" (reverse-scored item); and (3) "We do not adjust to the changing conditions in the environment, because we do not make the vital changes and implement them effectively" (reverse-scored item). Responses were on a five-point Likert scale (ranging from 1 = not at all to 5 = to a large extent). We performed an exploratory factor analysis. This procedure produced a two-factor solution. The first factor had an eigenvalue of 3.21, accounting for 41.47% of the variance and factor loadings ranging from .86 to .90. The second factor had an eigenvalue of 1.46, accounting for 36.76% of the variance and factor loadings ranging from .82 to .86. The Cronbach alpha for these scales were .82 and .88, respectively, well above the .70 criterion suggested by Hair et al. (1998).

3.2.2. Strategic decision comprehensiveness

We used the five-item scale developed by Atuahene-Giman and Li (2004) for assessing TMT engagement in strategic decision comprehensiveness. Respondents were asked to assess on a five-point scale (1 = not at all to 5 = to a large extent) the extent to which: (1) the TMT's decision making process was characterized by an in-depth discussion about many alternative courses of action to achieve the intended objectives; (2) in the decision-making process the TMT considered many different criteria before deciding on which courses of action to take; (3) in the decision-making process the TMT thoroughly examined multiple explanations for problems faced and opportunities available; (4) in the decision-making process the TMT conducted multiple examinations of suggested courses of action; and (5) in the decision-making process the TMT searched extensively for possible alternative courses of action. All items were subject to an exploratory factor analysis. This procedure produced a one-factor solution with an eigenvalue of 3.93, accounting for 78.67% of the variance and having factor loadings ranging from .85 to .90. The Cronbach's alpha for this measure was .93.

3.2.3. Connectivity

We used the six items on the scale developed and validated by Carmeli and Spreitzer (2009). We drew on previous research (Losada, 1999; Losada and Heaphy, 2004), which suggests that high quality connections reflect generativity and openness to new ideas and influences (Dutton and Heaphy, 2003). To assess the degree of connectivity between TMT members, respondents were asked to indicate the extent to which: (1) "the relationships between TMT members is open;" (2) "The relationships between TMT members are characterized by openness to new ideas from all members;" (3) "TMT members pay close attention to all ideas regarding new ways to improve the efficiency of the system;" (4) "The relationships between TMT members enable us to generate new things;" (5) "The relationships between TMT members enable us to learn new things;" and (6) "The relationships between TMT members enable us to seek new opportunities." The first three items assess openness in a relationship and the latter three items assess the degree to which a relationship is generative. Responses were made on a five-point Likert-type scale ranging from 1 = "not at all" to 5 = "to an exceptional degree". All items were factor analyzed and the results of this procedure produced a one-factor solution with an eigenvalue of 4.62, accounting for 77.01% of the variance and having factor loadings ranging from .82 to .91. The Cronbach's alpha for this measure was .93, identical to the reliability reported in the Carmeli and Spreitzer (2009) study.

3.2.4. Control variables

We controlled for potential effects of sector (1 = service, 0 = industrial). In addition, we controlled for industry conditions effects; this measure consisted of four items which assessed: (1) "the degree of rivalry in the industry in which the firm competes"; (2) "the degree of stability in the industry in which the firm competes"; (3) "the extent to which the life cycle of products/services in the industry is short"; and (4) "the extent to which competitors switch technologies rapidly". The first two items were adapted from the Carmeli and Schaubroeck (2006) study, and the third and fourth items were adapted from the Miller and Droge (1986) study. Results of a factor analysis on all four items produced a one-factor solution with an eigenvalue of 2.17, accounting for 54.22% of the variance and having factor loadings ranging from .66 to .85. The Cronbach's alpha for this measure was .71. We also controlled for TMT tenure assessed by the average tenure of TMT members. When members spend a longer period in a team they develop team familiarity, which is a key to understanding each other, building transactive memory systems and coping with adversaries. Finally, we controlled for TMT size, assessed by the number of members (including the CEO) who constitute the firm's TMT. Research suggests that TMT size may have an effect on TMT processes (Simsek et al., 2005) such as strategic decision making.

3.2.5. 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. Results showed that there was greater variability in the ratings between teams than within teams ($p < .01$). We also calculated an intragroup reliability test (R_{wg}) and intra-class correlations (ICCs) to assess group member agreement. ICC(1) indicates the extent of agreement among ratings from members of the same group. ICC(2) indicates whether groups can be differentiated based on the variables of interest. The ICC(1) and ICC(2) values for connectivity were .52 and .93 ($R_{wg} = .92$), strategic decision comprehensiveness values were .50 and .91 ($R_{wg} = .90$), and TMT resilience–efficacious beliefs and TMT resilience–adaptive capacity were .54 and .86 ($r_{wg} = .87$) and .52 and .80 ($r_{wg} = .83$). These values exceed conventional standards for aggregating individual questionnaire responses about team level analysis in field research (see Bliese, 2000).

4. Results

The means, standard deviations, reliabilities and correlations among the research variables are presented in Table 1. The bivariate correlations indicated that TMT connectivity was positively related to both strategic decision comprehensiveness ($r = .51$, $p < .01$), and both TMT resilience–efficacious beliefs and TMT resil-

Table 1
Means, standard deviations (s.d.), and correlations.

	Mean	S.d.	1	2	3	4	5	6	7	8	9
Sector (1 = service)	–	–	–								
Industry conditions	3.55	.57	−.11	(.71)							
TMT tenure	5.88	4.23	.21	−.23*	–						
TMT size	5.13	1.03	−.13	−.05	.02	–					
Past financial performance	3.61	.60	−.05	.15	−.14	−.07	(.78)				
TMT connectivity	3.82	.51	.01	.25*	.10	−.10	.34**	(.93)			
Strategic decision comprehensiveness	3.85	.47	−.04	.33**	−.08	.04	.41**	.51**	(.93)		
TMT resilience–efficacious beliefs	4.03	.46	−.18	.18	−.06	.10	.37**	.42**	.51**	(.82)	
TMT resilience-adaptive capacity	3.87	.65	−.07	.38**	.01	−.11	.40**	.50**	.62**	.31**	(.88)

Listwise $N = 74$; two-tailed test; reliabilities are in parentheses on the diagonal.
* $p < .05$.
** $p < .01$.

ience–adaptive capacity ($r = .42$, $p < .01$; $r = .50$, $p < .01$, respectively). Strategic decision comprehensiveness was positively associated with both TMT resilience–efficacious beliefs and TMT resilience–adaptive capacity ($r = .51$, $p < .01$; $r = .62$, $p < .01$, respectively).

To test the hypotheses, we followed the guidelines for testing mediation as outlined by Baron and Kenny (1986) and more recently modified and stipulated in Kenny et al. (1998), as well as performing further mediation tests as explained below.

To establish a mediation model, three basic conditions should be met: (1) establishing a significant relationship between the dependent variables and the independent variables; (2) establishing a significant relationship between the mediator and independent variables; and (3) showing that the significant relationship between the dependent variables and the independent variables becomes non-significant when the mediator is specified in the model. According to Kenny et al. (1998), a variable (M) mediates the relationship between an antecedent variable (X) and an outcome variable (Y) if (a) X is significantly related to Y; (b) X is significantly related to M; (c) after X is controlled for, M remains significantly related to Y; and (d) after M is controlled for, the X–Y relationship is zero. Kenny et al. (1998, p. 260) described these steps as "the essential steps in establishing mediation." The first step "is not required, but a path from the initial variable to the outcome is implied if [the two middle steps] are met" (Kenny et al., 1998, p. 260). Furthermore, the last step is necessary only to show a complete mediation effect. Accordingly, we tested successive segments of our model by evaluating whether these steps were met.

To test full mediation, we performed various regression equation analyses which are shown in Tables 2 and 3, and illustrated in Fig. 1. Although only Hypothesis 3 concerned mediation, each of the hypotheses was evaluated using the procedures for testing mediation outlined by Baron and Kenny (1986) and Kenny et al. (1998). The results of the regression of Model 3 in both Tables 2 and 3 support Hypothesis 1; the findings indicate a significant and positive relationship between strategic decision comprehensiveness and both TMT resilience–efficacious beliefs and TMT resilience–adaptive capacity ($\beta = .42$, $p < .01$; $\beta = .56$, $p < .01$, respectively).

Model 2 in both Tables 2 and 3 presents the results of the second regression, in which strategic decision comprehensiveness

Table 2
Hierarchical regression results for the relationships between connectivity, strategic decision comprehensiveness, and TMT resilience–efficacious beliefs.

	Model 1 β (t-value) TMT resilience–efficacious beliefs	Model 2 β (t-value) Strategic decision comprehensiveness	Model 3 β (t-value) TMT resilience–efficacious beliefs	Model 4 β (t-value) TMT resilience–efficacious beliefs
Constant[a]	3.09 (9.77**)	2.69 (8.29**)	3.09 (9.77**)	3.09 (9.77**)
Sector	−.15 (−1.40)	.01 (.05)	−.15 (−1.48)	−.15 (−1.48)
Industry conditions	−.17 (−1.61)	−.02 (−.18)	−.16 (−1.57)	−.16 (−1.62)
TMT tenure	−.07 (−.06)	−.09 (−.88)	.00 (−.00)	−.04 (−.35)
TMT size	.13 (1.25)	.10 (1.04)	.07 (.70)	.09 (.95)
Past financial performance	.23 (2.10*)	.25 (2.10*)	.19 (1.70)	.15 (1.37)
R^2	.20	.20	.20	.20
Adjusted R^2	.142	.112	.142	.142
F for R^2	3.45**	2.88*	3.45**	3.45**
Degrees of freedom	5, 69	5, 69	5, 69	5, 69
Strategic decision comprehensiveness			.42 (3.94**)	.33 (2.76**)
ΔR^2			.149	.149
F for ΔR^2			15.55**	15.55**
Adjusted R^2			.291	.291
Degrees of freedom			1, 68	1, 68
Connectivity	.36 (3.29**)	.44 (4.12**)		.21 (1.85)
ΔR^2	.11	.166		.032
F for ΔR^2	10.82**	17.01**		3.41
Overall R^2	.31	.338		.38
Adjusted R^2	.249	.28		.316
Degrees of freedom	1, 68	1, 68		7, 67
Overall F for R^2	5.09**	5.79**		5.88**

Note: Beta coefficients for all models are based on the last step of the regression.
[a] Coefficients are unstandardized.
* $P < .05$.
** $P < .01$.

Table 3
Hierarchical regression results for the relationships between connectivity, strategic decision comprehensiveness, and TMT resilience–adaptive capacity.

	Model 1 β (t-value) TMT resilience–adaptive capacity	Model 2 β (t-value) Strategic decision comprehensiveness	Model 3 β (t-value) TMT resilience–adaptive capacity	Model 4 β (t-value) TMT resilience–adaptive capacity
Constant[a]	2.34 (5.21**)	2.69 (8.29**)	2.34 (5.21**)	2.34 (5.21**)
Sector	−.08 (−.72)	.01 (.05)	−.08 (−.86)	−.08 (−.86)
Industry conditions	.01 (.08)	−.02 (−.18)	.02 (.20)	.02 (.18)
TMT tenure	.02 (.21)	−.09 (−.88)	.10 (1.05)	.07 (.70)
TMT size	−.06 (−.60)	.10 (1.04)	−.13 (−1.44)	−.11 (−1.21)
Past financial performance	.26 (2.34*)	.25 (2.10*)	.17 (1.68)	.14 (1.34)
R^2	.177	.20	.177	.177
Adjusted R^2	.117	.112	.117	.117
F for R^2	2.96**	2.88*	2.96**	2.96**
Degrees of freedom	5, 69	5, 69	5, 69	5, 69
Strategic decision comprehensiveness			.56 (5.66**)	.47 (4.32**)
ΔR^2			.264	.264
F for ΔR^2			32.08**	32.08**
Adjusted R^2			.391	.391
Degrees of freedom			1, 68	6, 68
Connectivity	.41 (3.38**)	.44 (4.12**)		.20 (1.86)
ΔR^2	.143	.166		.027
F for ΔR^2	14.269**	17.01**		3.45
Overall R^2	.319	.338		.468
Adjusted R^2	.259	.28		.412
Degrees of freedom	1, 68	1, 68		7, 67
Overall F for R^2	5.32**	5.79**		8.42**

Note: Beta coefficients for all models are based on the last step of the regression.
[a] Coefficients are unstandardized.
* $P < .05$.
** $P < .01$.

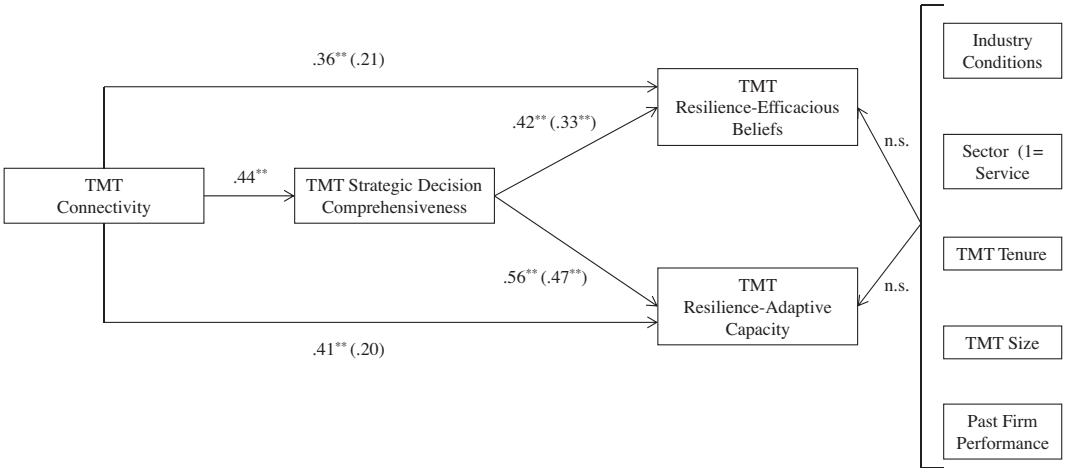

Fig. 1. The relationship between connectivity and strategic decision comprehensiveness for both resilience-efficacious beliefs and resilience–adaptive capacity. Beta coefficients in parentheses (.21,.20) are based on regression equations including the connectedness mediator. *$p < .05$; **$p < .01$.

was regressed on connectivity and the control variables. The results of Model 2 in both Table 2 indicate a positive and significant relationship between connectivity and strategic decision comprehensiveness ($\beta = .44$, $p < .01$), in support of Hypothesis 2.

Model 4 in Table 2, which regressed TMT resilience on both the independent variable (connectivity) and the mediator (strategic decision comprehensiveness), as well as the control variables, support the mediation hypothesis (Hypothesis 3). The effect of connectivity on TMT resilience–efficacious beliefs did not remain statistically significant ($\beta = .36$, $p < .01$ vs. $\beta = .21$, $p > .05$), whereas the effect of strategic decision comprehensiveness remained statistically significant ($\beta = .42$, $p < .01$ vs. $\beta = .33$, $p < .01$). Model 4 in Table 3, which regressed TMT resilience on both the independent variable (connectivity) and the mediator (strategic decision comprehensiveness), as well as the control variables, support the mediation hypothesis (Hypothesis 3). The effect of connectivity on TMT resilience–adaptive capacity did not remain statistically significant ($\beta = .41$, $p < .01$ vs. $\beta = .20$, $p > .05$), and the effect of strategic decision comprehensiveness remained statistically significant ($\beta = .56$, $p < .01$ vs. $\beta = .47$, $p < .01$). This indicates indirect effects, through strategic decision comprehensiveness, of connectivity on both forms of TMT resilience. These findings are depicted in Fig. 1.

We also calculated Sobel's (1982) mediation test. The results lend support to a fully mediated model for connectivity → strategic decision comprehensiveness → resilience–efficacious beliefs ($z = 2.85$, s.d. = .06, $p < .01$), and for connectivity → strategic decision comprehensiveness → resilience–adaptive capacity ($z = 3.29$, s.d. = .09, $p < .01$). As in previous studies (e.g., Dvorak and Simons,

2009), we also applied the procedure recommended by MacKinnon et al. (2007) who developed a program (PRODCLIN) that uses non-normal distributions of coefficient products to calculate unbiased CIs for mediated effects. The results were consistent with our earlier findings. Evaluation of the product confidence limits of this mediated effect via the PRODCLIN program (Mackinnon et al., 2007) revealed that strategic decision comprehensiveness fully mediated the linear effect of connectivity on both forms of TMT resilience.

We also tested alternative models. First, we tested whether strategic decision comprehensiveness played a moderating role in the relationship between connectivity and TMT resilience. Following Aiken and West (1991), the theoretical independent variables were mean centered before the interaction terms were calculated for all regressions. The results indicate that the interactive effects of connectivity and strategic decision comprehensiveness on both forms TMT resilience were not significant ($p > .10$).

5. Discussion

This study theorized that relational connections marked by connectivity are related to strategic decision comprehensiveness, which in turn is associated with TMT resilience, which we conceptualized as both efficacious beliefs and adaptive capacity. We found that (a) connectivity is positively related to strategic decision comprehensiveness, (b) strategic decision comprehensiveness is positively associated with TMT resilience, and (c) that connectivity directly (through strategic decision comprehensiveness) is positively related to both TMT resilience–efficacious beliefs and resilience–adaptive capacity.

5.1. Theoretical implications

This study expands on the observation that research "indicates that safety management in complex systems should focus on resilience – the ability to adapt or absorb disturbance, disruption and change" (Woods, 2006, p. 299), and attempts to enrich the literature on resilience by providing insights related to adaptive capacity in the face of challenging situations (Woods and Branlat, 2010, 2011). It does so by underscoring the importance of connectivity that underpins decision comprehensiveness, thereby cultivating resilience. Specifically, our research makes theoretical and empirical contributions to the literatures on TMT, strategic decision making processes and resilience in several ways. First, we answered the call to further investigate TMT processes by examining the relational connections between TMT members. Previous research suggests that TMT processes are potentially meaningful intervening constructs (Jarzabkowski and Searle, 2004) in helping to open the 'black box' of demography research (Lawrence, 1997), and thus are a critical potential refinement to Upper Echelon Theory (Hambrick, 2005). This study enriches recent developments in TMT processes research by exploring connectivity within the TMT. We provide new insights into this body of literature by integrating the emergent theory of high-quality connections (Dutton, 2003; Dutton and Heaphy, 2003; Ragins and Dutton, 2007) to better understand TMT processes and their effects on cognitive processes and capabilities. In addition, previous research on connectivity is scant; with the exception of Losada's (Losada, 1999; Losada and Heaphy, 2004) research on connectivity among management teams of 60 SBUs in a large information processing corporation, no study, to the best of our knowledge, has examined connectivity in organization's TMTs. In so doing, we were able to provide a first examination of a nascent and important relational construct that sheds further light on the emergent literature of TMT processes, thus providing additional insights into Upper Echelon Theory (Hambrick, 2005; Hambrick and Mason, 1984). This is important because leadership plays a key role in promoting safety, crisis-preparedness, and viability (Carmeli and Schaubroeck, 2008; Martínez-Córcoles et al., 2011).

Second, this study contributes to a better understanding of why some TMTs engage in strategic decision comprehensiveness and others do not. Previous research on strategic decision comprehensiveness has tended to focus on the implications of comprehensiveness in the decision making process on decision quality (Atuahene-Gima and Li, 2004; Bourgeois and Eisenhardt, 1988; Fredrickson, 1984; Ireland and Miller, 2004) though they actually "tended to test the effects of comprehensiveness on firm performance" (Forbes, 2007, p. 361). However, very little work has been done on the antecedents of strategic decision comprehensiveness. The findings of this study indicate that a high level of connectivity between TMT members facilitates their engagement in decision comprehensiveness, thus expanding our knowledge on managerial discretion (Hambrick and Abrahamson, 1995; Hambrick and Finkelstein, 1987) by showing whether and why relational connections facilitate or hinder comprehensiveness in strategic decision making processes. Specifically, we found that connectivity is a necessary relational mechanism which creates the space for more positive interactions between members such that they can openly discuss issues and make sense of them, as well as having the necessary generativity to effectively gather and process relevant information.

Third, this study enriches the current body of knowledge on the implications of decision comprehensiveness. While examining the effect of comprehensiveness on both outcomes – decision quality and organizational performance – is valuable, this study examined the effect of decision comprehensiveness on team resilience, a link that has not been examined. Further, research on resilience in organizational settings is still in an embryonic stage (Sutcliffe and Vogus, 2003), with little effort to directly examine the resilience of TMTs. Our research underscores the importance of decision comprehensiveness for cultivating a resilient team. In so doing, we expand on Wreathall's (2006) observation that resilience requires wide-ranging information not just about the outputs, but also on the intermediate activities or processes such that the capacity to cope and adapt is augmented.

Further, this study is a first endeavor to explore variation in two forms of TMT resilience by integrating the literatures on TMT processes, high-quality connections, and decision making processes. We found that connectivity is indirectly, through decision comprehensiveness, related to both forms of TMT resilience. Namely, the findings show that when TMT members are in a high-quality connection manifested by connectivity, they are more engaged in decision comprehensiveness and are, by implication, organized to cope and recover from adversity. As such, we provide some initial support for the power of relational mechanisms in cultivating resilience (Powley, 2009; Sutcliffe and Vogus, 2003), as well as for the role of strategic decision comprehensiveness in enhancing the capacity to bounce back from setbacks and adapt.

5.2. Implications for practice

Resilience is often seen as 'a capacity for continuous reconstruction'. This indicates that resilience is first and foremost defined as part of crisis handling and active adjustment to an organization's business environment (Hamel and Välikangas, 2003, p. 55). Nevertheless many organizations (especially successful ones) and their TMTs may find it extraordinarily difficult to reinvent themselves once they experience adversity and may be hesitant to divert needed resources from irrelevant and unneeded projects to those requiring the necessary capital and talent.

Our study provides some important insights into how organizational TMTs can cultivate resilience, and thus allow the system to effectively cope with threats, challenges and adversity, and bounce back from setbacks more resourceful and strengthened and continue to thrive (Sutcliffe and Vogus, 2003). First, most organizational turnarounds are undertaken as a result of a threat or crisis that triggers change and adaptation. However, this is actually a "transformation tragically delayed" (Hamel and Välikangas, 2003, p. 54). Such systems tend to lack adequate coping processes and respond to environmental jolts tardily. Senior managers thus need to seek ways to develop a resilient 'gene' that can build and nurture coping mechanisms and enable continuous adaptation. Megginson (1963, p. 4) noted that "according to Darwin's *Origin of Species*, it is not the most intellectual of the species that survives; it is not the strongest that survives; but the species that survives is the one that is able best to adapt and adjust to the changing environment in which it finds itself". We suggest that CEOs and their TMT members should pay closer attention to the relational connection within a team because it affects the type of decision making process they engage in. The mode of decision making process may affect the quality of decisions and responses they make, which ultimately determines the viability and functionality of the system as a whole.

The recent downturn of the economy has prompted a question that calls for an imperative answer: what measures can be taken so that managers and their organizations will be more resilient to such environmental turbulence? And which attributes lead to such resilience? The recession has caused organizations to realize that sustainability may very well be important to a firm but is obviously insufficient in itself, since it implies a balanced steady state which may be disrupted by an external shock that can potentially harm the organization or even paralyze it (Cascio, 2009). Resilience, therefore, is a capacity that organizational systems must develop and cultivate to overcome hardships. In Darwinian business terms organizations must adjust and improve over time if they wish to endure. This constant improvement over time is evident, for example, in organizations' growing awareness of proper management methodologies, human relations needs and modern financial and information technology requirements. However, few organizations are actively cultivating resilience although such a capacity may be vital for coping with environmental jolts and times of difficulty. Specifically, organizations should be encouraged to allocate means and attention to engage in a constant comprehensive analysis of their competitive environments (for example, through the establishment of economic, strategic and mergers and acquisitions [M&A] units which monitor and analyze market conditions and options) and by obtaining relevant, timely data (for example, through competitive intelligence). Moreover, an organization's senior leaders should consider ways to encourage openness among their TMT members and strengthen connections within the TMT (Battilana et al., 2010), as this may ultimately allow for a more comprehensive decision making process.

Our study also sheds further light on why managers should employ more comprehensive and extensive decision making processes. On the one hand, by being more comprehensive managers can improve their level of strategic grasp of their environments. On the other hand, there are costs in terms of time and resources consumed by decision-making processes (Forbes, 2007, p. 363). That is, we point to team engagement in processing information that is vital for knowing how to approach and manage complex issues, and acknowledge that this process is costly in terms of time and effort. Our research suggests that strategic understanding, a product of a comprehensive decision making process, may help a TMT to absorb strain, and preserve and improve functioning under adversity. However, managers must attend to both costs and benefits associated with such decision-making processes. Obviously, this is a choice that organizational stockholders and TMT must make (e.g., recover from difficulties and endurance at what cost?) an issue that depends on short- and long-term goals.

5.3. Limitations and future research directions

Although this research constitutes one of the first attempts to understand TMT processes and resilience, there are several limitations that should be noted and some important questions that still need to be answered. Although studies in varied contexts and settings are encouraged, caution is needed when attempting to overgeneralize the findings of this research to other contexts because it involves organizations in a specific geographical area. In addition, one should be cautious about drawing conclusions from survey-based data, particularly when attempting causal inferences. Although strategic decision comprehensiveness is facilitated by team conditions and dynamics, it is possible that engagement in decision comprehensiveness may strengthen the relational dynamics between TMT members. Compared to less resilient ones, resilient teams may express more positivity and thus form and shape a higher degree of connectivity and be more comprehensive in the decision making processes. We employed a crude test for the appropriateness of the proposed model in connecting the three variables that we used here, but nevertheless could not rule out a reverse model of resilience (with the two forms), involving decision comprehensiveness and connectivity. Thus, future research is needed to directly assess the causal direction of the proposed and tested model. In addition, we did not investigate TMT turnover which is often triggered by poor organizational performance (Finkelstein et al., 2009), and thus could not capture a key question about the effect of TMT turnover on resilience. This may be a novel research avenue to better understand the link between turnover and resilience in TMTs. Another limitation is associated with the team member reports on which we relied in this study. However, when we tested the same model using different respondents we obtained similar results, lending some weight to the claim that biases are not a severe problem in this study. Collecting data from TMT members is extremely challenging although previous research relying on perceptual data indicates that senior executives tend to provide reliable data. Further, because our measurement items were all at the team level, respondents were less likely to feel defensive and act to inflate the data.

These limitations notwithstanding, our study also raises some important questions and some interesting avenues of research. We know very little about how CEOs shape processes (O'Reilly et al., 2010) that help build and sustain TMT resilience. Several strategies can be envisaged for organizing team resilience, starting with the setup of the team, the expectations conveyed by the CEO and the kind of behaviors that are modeled. Research in this direction is encouraged. We pointed to connectivity as a relational connection construct that helps understand cognitive processes. However, we know relatively little about the conditions under which this linkage is strengthened or weakened.

Further, as a fairly understudied concept, resilience still requires some structural theoretical work (Sutcliffe and Vogus, 2003). For example, do resilient organizations constantly reinvent themselves so that they experience fewer setbacks (also known as "zero trauma", Hamel and Välikangas, 2003, p. 54) or high-reliability organizations (Weick and Sutcliffe, 2001), or do they act as a system responding to disaster (Comfort, 1994)? What are the threats, challenges and disasters that organizations encounter and how do different types of adversity affect organizational coping strategies? In addition, more research is needed on the operationalization and measurement of organizational resilience (O'Neal, 1999).

Finally, research on resilience in organizations in general and in TMTs is scarce. Further research is needed to explore both the antecedents and consequences of resilience. We focused on the relational underpinnings of resilience but we do not know how relational mechanisms interact with other structural variables in explaining and predicting variance in resilience. Finally, we have limited knowledge on the dynamics of resilience, and thus future research should attempt to unravel when, why and how the level of resilience changes.

6. Conclusion

This study highlights the importance of relational connections among TMT members in facilitating strategic decision comprehensiveness and cultivating TMT resilience. We probed to two forms of resilience – beliefs and capacity to absorb strain, recover and adapt positively in the face of adversity. Our findings indicate that a high level of connectivity within TMTs facilitates engagement in strategic decision comprehensiveness and helps cultivate a resilient TMT. Our study contributes to Upper Echelon Theory by integrating separate theories and bodies of research to better understand relational mechanisms and decision making processes and their role in cultivating TMT resilience. In so doing, this study encourages a line of inquiry which may facilitate meaningful discussions on issues in upper echelon, strategic decision-making processes, relational connections and resilience.

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References

Aiken, L.S., West, S.G., 1991. Multiple Regression: Testing and interpreting interactions. Sage, Newbury Park, CA.
Amalberti, R., 2006. Optimum system safety and optimum system resilience: agonist or antagonists concepts? In: Hollnagel, E., Woods, D.D., Leveson, N. (Eds.), Resilience Engineering: Concepts and Precepts. Ashgate, Aldershot, UK, pp. 238–256.
Armstrong, J.S., Overton, T., 1977. Estimating nonresponse bias in mail surveys. Journal of Marketing Research 19, 396–402.
Atuahene-Gima, K., Li, H.Y., 2004. Strategic decision comprehensiveness and new product development outcomes in new technology ventures. Academy of Management Journal 47, 583–597.
Bandura, A., 1997. Self-Efficacy: The Exercise of Control. W.H. Freeman, New York.
Baron, R.M., Kenny, D.A., 1986. The moderator–mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. Journal of Personality and Social Psychology 51, 1173–1182.
Barrick, M.R., Bradley, B.H., Colbert, A.E., 2007. The moderating role of top management team interdependence. Implications for real teams and working groups. Academy of Management Journal 50, 544–557.
Battilana, J., Gilmartin, M., Sengul, M., Pache, A., Alexander, J.A., 2010. Leadership competencies for implementing planned organizational change. The Leadership Quarterly 21, 422–438.
Baum, J.A.C., Ingram, P., 1998. Survival-enhancing learning in the Manhattan hotel industry, 1898–1980. Management Science 44, 996–1016.
Bliese, P.D., 2000. Within-group agreement, non-independence, and reliability: Implications for data aggregation and analyses. In: Klein, K.J., Kozlowski, S.W.J. (Eds.), Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions. Jossey-Bass, San Francisco, pp. 349–381.
Bonanno, G.A., 2004. Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events? American Psychologist 59, 20–28.
Bourgeois, J., Eisenhardt, K., 1988. Strategic decision processes in high velocity environments: Four cases in the microcomputer industry. Management Science 34, 816–835.
Bowman, C., Ambrosini, V., 1997. Using single respondents in strategy research. British Journal of Management 8, 119–131.
Brislin, R.W., 1986. The wording and translation of research instruments. In: Lonner, W.J., Berry, J.W. (Eds.), Field Methods in Cross-Cultural Research. Sage, Thousand Oaks, CA, pp. 137–164.
Brown, S., Eisenhardt, K.M., 1997. The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. Administrative Science Quarterly 42, 1–34.
Cameron, K., Mora, C., Leutscher, T., Calarco, M., 2011. Effects of positive practices on organizational effectiveness. Journal of Applied Behavioral Science 47, 266–308.
Carmeli, A., Gelbard, R., Gefen, D., 2010. The importance of innovation leadership in cultivating strategic fit and enhancing firm performance. The Leadership Quarterly 21, 339–349.
Carmeli, A., Markman, G.D., 2011. Capture, governance, and resilience. Strategy implications from the history of Rome. Strategic Management Journal 32, 322–341.
Carmeli, A., Schaubroeck, J., 2006. Top management team behavioral integration, decision quality, and organizational decline. The Leadership Quarterly 17, 441–453.
Carmeli, A., Schaubroeck, J., 2008. Organizational crisis-preparedness: The importance of learning from failures. Long Range Planning 41, 177–196.
Carmeli, A., Sheaffer, Z., 2008. How learning leadership and organizational learning from failures enhance perceived organizational capacity to adapt to the task environment. Journal of Applied Behavioral Science 44, 468–489.
Carmeli, A., Spreitzer, G.M., 2009. Trust, Connectivity, and Thriving: Implications for Innovative Behaviors at Work. Journal of Creative Behavior 43, 169–191.
Carver, C.S., 1998. Resilience and thriving: Issues, models, and linkages. Journal of Social Issues 54, 245–266.
Cascio, J., 2009. The Next Big Thing: Resilience. Foreign Policy. <http://www.foreignpolicy.com/articles/2009/04/15/the_next_big_thing_resilience> (retrieved May/June).
Chakravarthy, B.S., 1982. Adaptation: a promising metaphor for strategic management. Academy of Management Review 7, 35–44.
Chen, G., Gully, S.M., Eden, D., 2001. Validation of a new general self-efficacy scale. Organizational Research Methods 4, 62–83.
Christensen, E., Fjermestad, J., 1997. Challenging group support systems research: The case for strategic decision making. Group Decision and Negotiation 6 (4), 351–372.
Comfort, L., 1994. Risk and resilience: inter-organizational learning following the Northridge earthquake of 17 January 1994. Journal of Contingencies and Crisis Management 2, 157–170.
Cook, R., Render, M., Woods, D., 2000. Gaps in the continuity of care and progress on patient safety. BMJ 320, 791–794.
Dean, J., Sharfman, M., 1993. Procedural rationality in the strategic decision making process. Journal of Management Studies 30, 587–610.
Dutton, J.E., 2003. Energize Your Workplace. How to Build and Sustain High-Quality Connections at Work. Jossey-Bass Publishers, San Francisco.
Dutton, J.E., Heaphy, E.D., 2003. The power of high-quality connections at work. In: Cameron, K.S., Dutton, J.E., Quinn, R.E. (Eds.), Positive Organizational Scholarship. Berrett-Koehler Publishers, San Francisco, pp. 263–278.
Dutton, J.E., Sonenshein, S., 2009. Positive organizational scholarship. In: Lopez, S.J. (Ed.), Encyclopedia of Positive Psychology. Blackwell Publishing, Oxford, pp. 737–742.
Dutton, J.E., Worline, M.C., Frost, P.J., Lilius, J., 2006. Explaining compassion organizing. Administrative Science Quarterly 51 (1), 59–96.
Dvorak, R.D., Simons, J.S., 2009. Moderation of resource depletion in the self-control strength model: differing effects of two modes of self-control. Personality and Social Psychology Bulletin 35, 572–583.
Eden, C., Ackerman, F., 2001. Group decision and negotiation in strategy making. Group Decision and Negotiation 10, 119–140.
Edmondson, A., 1999. Psychological safety and learning behavior in work teams. Administrative Science Quarterly 44, 350–383.
Edmondson, A., 2003. Speaking up in the operating room: how team leaders promote learning in interdisciplinary action teams. Journal of Management Studies 40, 1419–1452.
Egelhoff, W.G., 1991. Information-processing theory and the multinational enterprise. Journal of International Business Studies 22, 341–368.
Eisenhardt, K.M., 1999. Strategy as strategic decision making. Sloan Management Review 40, 65–72.
Farjoun, M., 2005. History and policy at the space shuttle program. In: Starbuck, W.H., Farjoun, M. (Eds.), Organization at the Limit: Lessons from the Columbia Disaster. Blackwell Publishing, Oxford, UK, pp. 21–40.
Fergus, S., Zimmerman, M.A., 2005. Adolescent resilience: a framework for understanding healthy development in the face of risk. Annual Review Public Health 26, 399–419.
Finkelstein, S., Hambrick, D.C., Cannella Jr., A.A., 2009. Strategic Leadership. Oxford University Press, Oxford.
Flach, F.F., 1997. Resilience: Discovering a New Strength at Times of Stress. Fawcett Columbine, New York.
Forbes, D., 2007. Reconsidering the strategic implications of decision comprehensiveness. Academy of Management Review 32, 361–376.
Fredrickson, B.L., 2001. The role of positive emotions in positive psychology: The broaden and-build theory of positive emotions. American Psychologist 56, 218–226.
Fredrickson, J.W., 1984. The comprehensiveness of strategic decision processes: extension, observations, future directions. Academy of Management Journal 27, 445–466.

Fredrickson, J.W., Mitchell, T., 1984. Strategic decision processes: comprehensiveness and performance in an industry with an unstable environment. Academy of Management Journal 27, 399–423.
Gittell, J.H., Cameron, K., Lim, S., Rivas, V., 2006. Relationships, layoffs, and organizational resilience: airline industry responses to September 11. Journal of Applied Behavioral Science 42, 300–329.
Glick, W., Miller, C., Huber, G., 1993. The impact of upper echelon diversity on organizational performance. In: Huber, G., Glick, W. (Eds.), Organizational Change and Redesign: Ideas and Insights for Improving Performance. Oxford University Press, New York, pp. 176–214.
Gulati, R., 2010. Reorganize for resilience: putting customers at the center of your organization. Harvard Business School Press, Boston.
Hair, J.F., Anderson, P.E., Tatham, R.L., Black, W.C., 1998. Multivariate Data Analysis. Prentice Hall, NJ.
Hambrick, D.C., 1994. Top management groups: A conceptual integration and reconsideration of the 'team' label. In: Staw, B.M., Cummings, LL. (Eds.), Research in Organizational Behavior. JAI Press, Greenwich, Connecticut, pp. 171–214.
Hambrick, D.C., 1998. Corporate coherence and the top management team. In: Hambrick, D.C., Nadler, D.A., Tushman, M.L. (Eds.), Navigating Change: How CEOs, Top Teams, and Boards Steer Transformation. Harvard Business School Press, Boston, MA, pp. 123–140.
Hambrick, D.C., 2005. Upper echelon theory: origin, twists and turns, and lessons learned. In: Smith, K.G., Hitt, M.A. (Eds.), Great Minds in Management: The Process of Theory Development. New York, Oxford, pp. 109–127.
Hambrick, D., Abrahamson, E., 1995. Assessing managerial discretion across industries: a multimethod approach. Academy of Management Journal 38, 1427–1441.
Hambrick, D., Finkelstein, S., 1987. Managerial discretion: a bridge between polar views on organizations. Research in Organizational Behavior 9, 369–406.
Hambrick, D.C., Mason, P.A., 1984. Upper echelons: the organization as a reflection of its top management. Academy of Management Review 9, 193–206.
Hamel, G., Välikangas, L., 2003. The quest for resilience. Harvard Business Review 81, 52–63.
Haunschild, P.R., Sullivan, B.N., 2002. Learning from complexity: effects of prior accidents and incidents on airlines' learning. Administrative Science Quarterly 47, 609–643.
Ireland, R.D., Miller, C., 2004. Decision-making and firm success. Academy of Management Executive 18, 8–12.
James, L.R., 1982. Aggregation bias in estimates of perceptual agreement. Journal of Applied Psychology 67, 219–229.
Janis, I.L., Mann, L., 1977. Decision Making. Free Press, New York.
Jarzabkowski, P., Searle, R.H., 2004. Harnessing diversity and collective action in the top management team. Long Range Planning 37, 399–419.
Kahn, W.A., 2001. Holding environment at work. Journal of Applied Behavioral Science 37, 260–279.
Kahn, W.A., 2007a. Commentary: positive relationships in groups and communities. In: Dutton, J.E., Ragins, B.R. (Eds.), Exploring Positive Relationships at Work. Lawrence Erlbaum Associates, Mahwah, NJ, pp. 277–285.
Kahn, W.A., 2007b. Meaningful connections: positive relationships and attachments at work. In: Dutton, J.E., Ragins, B.R. (Eds.), Exploring Positive Relationships at Work. Lawrence Erlbaum Associates, Mahwah, NJ, pp. 189–207.
Kavanagh, S., 2009. Building a financially resilient government through long-term financial planning. Government Finance Review 25, 8–12.
Kenny, D.A., Kashy, D., Bolger, N., 1998. Data analysis in social psychology. In: Gilbert, D., Fiske, S., Lindzey, G. (Eds.), Handbook of Social Psychology. McGraw-Hill, New York, pp. 233–265.
Kobasa, S.C., Maddi, S.R., Puccetti, M.C., Zola, M.A., 1985. Effectiveness of hardiness, exercise, and social support as resources against illness. Journal of Psychosomatic Resources 29, 525–533.
Kozlowski, S.W.J., Bell, B.S., 2003. Work groups and teams in organizations. In: Borman, W.C., Ilgen, D.R., Klimoski, R.J. (Eds.), Handbook of Psychology: Industrial and Organizational Psychology, vol. 12. Wiley, New York, pp. 333–375.
Kozlowski, S.W.J., Bell, B.S., 2008. Team learning, development, and adaptation. In: Sessa, V.I., London, M. (Eds.), Work Group Learning. Lawrence Erlbaum Associates, Mahwah, NJ, pp. 15–44.
Langer, E.J., Moldoveanu, M., 2000. The construct of mindfulness. Journal of Social Issues 56, 1–9.
Lawrence, B.S., 1997. The black box of organizational demography. Organization Science 8, 1–22.
Lengnick-Hall, C.A., Beck, T.E., 2005. Adaptive fit versus robust transformation: how organizations respond to environmental change. Journal of Management 31 (5), 738–757.
Li, J.T., Hambrick, D.C., 2005. Factional groups: a new vantage on demographic faultlines, conflict, and disintegration in work teams. Academy of Management Journal 48, 794–813.
Lilius, J.M., Worline, M.C., Dutton, J.E., Kanov, J.M., Maitlis, S., 2011. Understanding compassion capability. Human Relations 64 (7), 873–899.
Lindblom, C., 1959. The science of "muddling through". Public Administration Review 19, 79–88.
Losada, M., 1999. The complex dynamics of high performance teams. Mathematical and Computer Modelling 30, 179–192.
Losada, M., Heaphy, E., 2004. The role of positivity and connectivity in the performance of business teams: a nonlinear dynamics model. American Behavioral Scientist 47, 740–765.
Lubatkin, M.H., Simsek, Z., Ling, Y., Veiga, J.F., 2006. Ambidexterity and performance in small- to medium-sized firms: the pivotal role of top management team behavioral integration. Journal of Management 32, 646–672.
MacKinnon, D.P., Fritz, M.S., Williams, J., Lockwood, C.M., 2007. Distribution of the product confidence limits for the indirect effect: program PRODELIN. Behavior Research Methods 39, 384–389.
Martínez-Córcoles, M., Gracia, F., Tomás, I., Peiró, J.M., 2011. Leadership and employees' perceived safety behaviours in a nuclear power plant: a structural equation model. Safety Science 49 (8–9), 1118–1129.
Masten, A.S., Reed, M.J., 2002. Resilience in development. In: Snyder, C.R., Lopez, S.J. (Eds.), Handbook of Positive Psychology. Oxford University Press, New York, pp. 74–88.
Mathieu, J.E., Maynard, M.T., Rapp, T., Gilson, L., 2008. Team effectiveness 1997–2007: a review of recent advancements and a glimpse into the future. Journal of Management 34, 410–476.
Megginson, L.C., 1963. Lessons from Europe for American business. Southwestern Social Science Quarterly 44, 3–13.
Miller, C.C., 2008. Decisional comprehensiveness and firm performance. Towards a more complete understanding. Journal of Behavioral Decision Making 21, 598–620.
Miller, D., Droge, C., 1986. Psychological and traditional determinants of structure. Administrative Science Quarterly 31, 539–560.
Mintzberg, H., Raisinghani, P., Theoret, A., 1976. The structure of 'unstructured' decision processes. Administrative Science Quarterly 21, 246–275.
Mooney, A.C., Sonnenfeld, J., 2001. Exploring antecedents to conflict during strategic decision making: the importance of behavioral integration. In: A Paper Presented in the Academy of Management Meeting, BPS Division.
Morel, G., Amalberti, R., Chauvin, C., 2009. How good micro/macro ergonomics may improve resilience, but not necessarily safety. Safety Science 47, 285–294.
Nadler, D., Tushman, M., 1980. A diagnostic model for organizational behavior. In: Hackman, J.R., Lawler, E., Porter, L.W. (Eds.), Perspectives on Behavior in Organizations. McGraw-Hill, New York, pp. 83–100.
Nystrom, P.C., Starbuck, W.H., 1984. To avoid organizational crisis, unlearn. Organizational Dynamics 12, 53–64.
Nutt, P.C., 2004. Expanding the search for alternatives during strategic decision-making. Academy of Management Executive 18, 13–28.
O'Neal, M., 1999. Measuring resilience. In: Paper Presented at the Annual Meeting of the Mid-South Educational Research Association (November 17–19, 1999). Point Clear, AL.
O'Reilly, C.A., Caldwell, D.F., Chatman, J.A., Lapiz, M., Self, W., 2010. How leadership matters: the effects of leaders' alignment on strategy implementation. Leadership Quarterly 21, 104–113.
Patterson, E.S., Woods, D.D., Cook, R.I., Render, M.L., 2007. Collaborative crosschecking to enhance resilience. Cognition, Technology & Work 9, 155–162.
Pettigrew, A.M., 1992. On studying managerial elites. Strategic Management Journal 13, 163–182.
Powley, E.H., 2009. Reclaiming resilience and safety: resilience activation in the critical period of crisis. Human Relations 62, 1289–1326.
Ragins, B.R., Dutton, J.E., 2007. Positive relationships at work: an introduction and invitation. In: Dutton, J.E., Ragins, B.R. (Eds.), Exploring Positive Relationships at Work: Building a Theoretical and Research Foundation. Lawrence Erlbaum, Mahwah, NJ, pp. 1–25.
Rasmussen, J., Pejtersen, A.M., Goodstein, L.P., 1994. Cognitive Systems Engineering. Wiley, New York.
Siggelkow, N., 2002. Evolution toward fit. Administrative Science Quarterly 47, 125–159.
Simsek, Z., Lubatkin, M.H., Veiga, J.F., Dino, R.N., 2005. Modeling the multilevel determinants of top management team behavioral integration. Academy of Management Journal 48, 69–84.
Smith, K.G., Smith, K.A., Olian, J.D., Sims, H.P., O'Bannon, D.P., Scully, J.A., 1994. Top management team demography and process: the role of social integration and communication. Administrative Science Quarterly 39, 412–438.
Sobel, M.E., 1982. Asymptotic confidence intervals for indirect effects in structural equation models. In: Leinhart, S. (Ed.), Sociological Methodology. Jossey-Bass, San Francisco.
Sutcliffe, K.M., Vogus, T.J., 2003. Organizing for resilience. In: Cameron, K.S., Dutton, J.E., Quinn, R.E. (Eds.), Positive Organizational Scholarship: Foundations of a New Discipline. Berrett-Koehler, San Francisco, pp. 94–121.
Tugade, M.M., Fredrickson, B.L., 2004. Resilient individuals use positive emotions to bounce back from negative emotional experiences. Journal of Personality and Social Psychology 86, 320–333.
Waldman, D.A., Carmeli, A., Halevi, M.Y., 2011. Beyond the red tape: how victims of terrorism perceive and react to organizational responses to their suffering. Journal Organizational Behavior 32, 938–954. http://dx.doi.org/10.1002/job.710.
Weick, K.E., Sutcliffe, K.M., 2001. Managing the Unexpected: Assuring high Performance in an Age of Complexity. Jossey-Bass, University of Michigan Pressing Problem Series, San Francisco.
Weick, K.E., Sutcliffe, K.M., Obstfeld, D., 1999. Organizing for high reliability: processes of collective mindfulness. In: Staw, B.M., Cummings, L.L. (Eds.), Research in Organizational Behavior, vol. 21. JAI Press, Greenwich, CT, pp. 81–123.
Woods, D.D., 2005. Creating foresight: lessons for enhancing resilience from Columbia. In: Starbuck, W.H., Farjoun, M. (Eds.), Organization at the

Limit: Lessons from the Columbia Disaster. Blackwell Publishing, Oxford, pp. 289–308.
Woods, D.D., 2006. Essential characteristics of resilience. In: Hollnagel, E., Woods, D.D., Leveson, N. (Eds.), Resilience Engineering: Concepts and Precepts. Ashgate, Aldershot, UK, pp. 21–34.
Woods, D.D., Branlat, M., 2010. Hollnagel's test: being 'in control' of highly interdependent multi-layered networked systems. Cognition, Technology & Work 12, 95–101.
Woods, D.D., Branlat, M., 2011. Basic patterns in how adaptive systems fail. In: Hollnagel, E., Pariès, J., Woods, D.D., Wreathall, J. (Eds.), Resilience Engineering in Practice. Ashgate, Farnham, UK, pp. 127–144.
Woods, D.D., Hollnagel, E., 2006. Joint Cognitive Systems: Patterns in Cognitive Systems Engineering. CRC Press/Taylor & Francis Group, Boca Raton, FL.
Woods, D.D., Shattuck, L.G., 2000. Distant supervision–local action given the potential for surprise. Cognition, Technology and Work 2, 86–96.
Wreathall, J., 2006. Properties of resilient organizations: an initial view. In: Hollnagel, E., Woods, D.D., Leveson, N. (Eds.), Resilience Engineering: Concepts and Precepts. Ashgate, Aldershot, UK, pp. 275–285.
Zajac, E.J., Kraatz, M.S., Bresser, R.K.F., 2000. Modeling the dynamics of strategic fit: a normative approach to strategic change. Strategic Management Journal 21, 429–453.

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