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Transactive Memory Systems in Top Management Teams and Organizational Ambidexterity: Evidence from Palestine.

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Abstract

Purpose – While several extant studies have found that transactive memory systems (TMS) among top management teams (TMTs) empowers innovation ambidexterity (IA), and individual innovation behavior (IIB). Yet, most of these studies have not paid sufficient attention on how the differentiated knowledge inherent in TMS is integrated. Our paper objectives to contribute to the literature by investigating how TMS promotes ambidexterity while exploring how TMT shared leadership and behavioral integration accounts for the TMS-IA and TMS-IIB paths.

Design/methodology/approach – This study is based on a questionnaire survey of 124 top managers in Palestinian banks. (within two times), the dependent variables in the first time, and the independent variable in the second time.

Findings – Our study finds that TMS has a positive and significant direct effect on shared leadership, behavioral integration, and innovation ambidexterity, and that shared leadership, while exhibiting a positive effect on innovation ambidexterity, also mediates the positive effect of TMS on innovation ambidexterity. While TMS does not exhibit any significant direct effect on (IIB), it did exhibit a significant total effect on IIB. However, shared leadership not only exhibited a positive and significant direct effect on IIB but also mediated the non-significant direct effect (but significant total effect) of TMS on IIB, thereby exhibiting an indirect-only mediation effect (full mediation). Behavioral integration exhibited a positive and significant effect on individual innovation behavior and innovation ambidexterity. However, unlike shared leadership, behavioral integration has no significant mediation effect on the TMS-IA path, neither does it mediate the TMS-IIB path. Finally, we find evidence for the significant moderating effect of TMT involvement on the behavioral integration-IIB path, with high levels of TMT involvement dampening the effect and low levels strengthening the effect.

Originality/value – The current research contributes to the literature to covers its gaps. We explored the individual team interface by considering the effect of TMS on an individual level of TMT's behavior and the influence of behavioral integration. Moreover, responding to the call of future research recommendations of exploring the second-order TMS variables. Lastly, we choose a different cultural context of an occupied developing country (Palestine). We also focused on the bank's top managers and executives.

Keywords- Transactive memory system, Shared leadership, Top management teams, TMT involvement, Innovation ambidexterity, behavioral integration, upper echelon theory, Individual Innovation behavior

Introduction

While many scholars have explored the innovation ambidexterity phenomenon to a considerable extent, it remains a topic for which scholarly questions are still inexhaustive. This is because, although the nature of extant research on the subject is as varied as the domains and levels within which they were studied, these studies have unanimously concluded that innovation ambidexterity plays a very pivotal role in ensuring the continued existence and perennial

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performance of the organization (Heavey, Simsek, & Heavey, 2015). Extant studies reveal that maintaining a fine balance between the exploration and exploitation dimensional dichotomy of innovation ambidexterity is one of the most profound antecedents of the development sustenance of competitive advantage in organizations (Raisch, Birkinshaw, Probst, Tushman, & Tushman, 2009). Despite the above, other scholars have found that in practice, the maintenance of a congruent balance between explorative and exploitative activities within organizations poses a myriad of challenges to leadership teams striving for ambidexterity - chief among which is deciding on which of these two dimensions of ambidexterity deserves the allocation of a higher proportion of the organization's inherently scarce material and temporal resources (Andriopoulos, Lewis, & Lewis, n.d.; He & Wong, 2004). Therefore, it is important to attain innovation ambidexterity in organizations and the inherent tensions surrounding its practical attainment that continue to create the crucial and currently exhaustive gaps within the antecedents of ambidexterity literature which this current study contributes to plugging.

Contrary to commonly held misconceptions that individual executives shape the strategic decision-making processes in organizations, proponents of the upper echelons theory have demonstrated that it is the collective cognition resource-pools and efforts of an organization's top management teams (TMT) that in reality wields the most significant influence on the strategic decisions taken by organizations (Hambrick, 2007). As innovation represents a manifest outcome of strategic decisions, it follows that the organization's leadership represented by its TMT is responsible for its ambidextrous capability concerning innovation. This much has already been demonstrated in extant literature (Laureiro-Martínez, Brusoni, & Zollo, 2010; H. E. Lin & McDonough, 2014; Smith & Tushman, 2005). However, according to (Q. Chen & Liu, 2018), two prominent issues TMTs face when striving for innovation ambidexterity concern, first of all, the effective isolation and differentiation of the diverse cognitive knowledge, perspective, and expertise inherently necessary for the successful coordination of the two core domains of ambidexterity; and the effective integration of this isolated cognition. In other words, explorative and exploitative activities are examined in light of the unique and diverse cognition required for their successful deployment and the integration of this cognition in ways that lead to successful innovation outcomes for firms. However, concerning the first issue, an examination of extant literature reveals that TMT cognition is typically conceptualized, measured, and operationalized using proxies such as demographic characteristics and compositional variables, considerably impeding our fundamental understanding of how and when TMT is differentiating cognitions influence innovation ambidexterity in firms (Bell, Villado, Lukasik, Belau, & Briggs, 2011; Q. Chen & Liu, 2018; Y.-H. Li & Huang, 2013). This dependence on indirect superficial constructs as the basis for analyzing TMT differentiating cognition has been shown to not only explain firm outcomes poorly but also deprive the body of scholarly knowledge valuable insights into the underlying mechanisms that govern how TMT cognitions influence strategic decisions and have led a considerable number of scholars to out rightly call for the direct examination of TMT differentiating cognitions (Hambrick, 2007; J. Li, Zhou, Zhang, Chen, & Tian, 2018; Narayanan, Zane, & Kemmerer, 2011).

The most prominent approach to directly measuring TMT differentiating cognition is through the transactive memory system (TMS). A TMS is a cognitive construct designed to measure the disparate, diverse effectively yet complementary implicit knowledge of team members and has been demonstrated to determine measure accurately and enable the comparison of the richness and diversity of the collective knowledge of teams (Fan, Chang, Albanese, Wu, & Chuang, 2016; Peltokorpi & Hasu, 2016; Wegner, Giuliano, & Hertel, 1985). Furthermore, extant studies have shown that the higher the level of a TMT's enriched collective knowledge, the higher its propensity to develop differentiating cognitions because such enriched collective cognition makes it highly likely that TMTs would collectively possess the depth and breadth of cognitive knowledge necessary to successfully engage in explorative and exploitative innovation activities (Li et al., 2016 and Chen and Liu, 2018). Thus, following in the footsteps of Chen & Liu, (2018), our study examines TMS as the underlying mechanism through which TMTs navigate the cognitive differentiation issues necessary for successful innovation ambidexterity and how it does so.

About the second issue TMTs face when pursuing ambidexterity integration challenge, and review of the recent literature illustrate that while some studies have been able to establish that a TMS directly and favorably facilitates ambidexterity (Dai, Du, Byun, & Zhu, 2017; Heavey et al., 2015) these studies focused more on the differentiating cognition aspect of TMSs and failed to adequately account for how TMTs integrate the disparate cognitive knowledge which conjointly influences ambidexterity. (Q. Chen & Liu, 2018) note that this practice among recent TMS scholars devoted little attention to the integration aspects of TMS results from the erroneous notion commonly held that the integration function is automatic. More recent studies show that within executive spheres, the knowledge integration function of a TMS does not always occur automatically, and even when it does may do so in a highly inefficient manner due to the diverse relational issues that typically exist within and among TMTs (Heavey et al., 2015; Peltokorpi & Hasu, 2014a). Here again, we find that extant literature inadequately and poorly accounts for the mechanisms through which diverse knowledge domains isolated from the differentiating cognition stage of a TMS are integrated, representing a second prominent gap in the literature that our study investigates.

Following Chen and Liu, (2018), we depend on the theoretical recommendations of Hambrick and Mason's (1984) upper echelons theory for guidance on a suitable TMT mechanism that accurately enables our account for the integration of the differentiated knowledge of a TMS. We similarly examine the mediating effect of TMT shared leadership as the integrating construct through which TMTs integrate the differentiated knowledge domains from a TMS. Extant definitions of TMT shared leadership posits a set of collective decision-making behaviors that involve the sharing and integration of information and assuming shared responsibility for leading executive team members to attain organizational goals and development (Carson, Tesluk, & Marrone, 2007a; Hoch & Dulebohn, 2013). It has also been found to create an enabling environment for collective decision making which inherently involves collective discussion and integration of executive knowledge and thus the generation of comprehensive co-decisions (Mihalache, Jansen, Van den Bosch, & Volberda, 2014; Wu, Wei, Tseng, & Cheng, 2018).

The current study will contribute to the literature by examining gaps that were recently identified in previous studies. The first one was captured by (Qian Chen, 2018), who recommended future studies explore the individual team interface by considering the effect of TMS on individual top managers' behavior. On the other hand, (Heavey & Simsek, 2017) stated that the positive and significant impact of TMS becomes non-significant when the influence of behavioral integration is taken into consideration. Lastly, we provide evidence from a different cultural context - occupied developing country; we also focused on the bank's top managers and executives.

Theory and hypotheses

The differentiation–integration challenge of Innovation ambidexterity

Innovation ambidexterity deliberates the organization's ability to make a balance between explorative and exploitative Innovation (O'Reilly & Tushman, 2013). Explorative innovation consists of searching for new knowledge, opportunities, and experimentation. Whereas exploitative innovation consists of refining existing knowledge, securing advantages and efficiency, March (1991), both exploration and exploitation have dynamic capabilities of path-dependent and self-reinforcing.

Both exploration and exploitation compete for scarce resources, and thus, they tend to crew each other out (Andriopoulos et al., n.d.; March 1991; Smith & Tushman, 2005). Therefore, March (1999) argued that balance is very difficult to achieve, and failure to achieve that balance correctly may even undermine the firm. (Hughes, 2018).

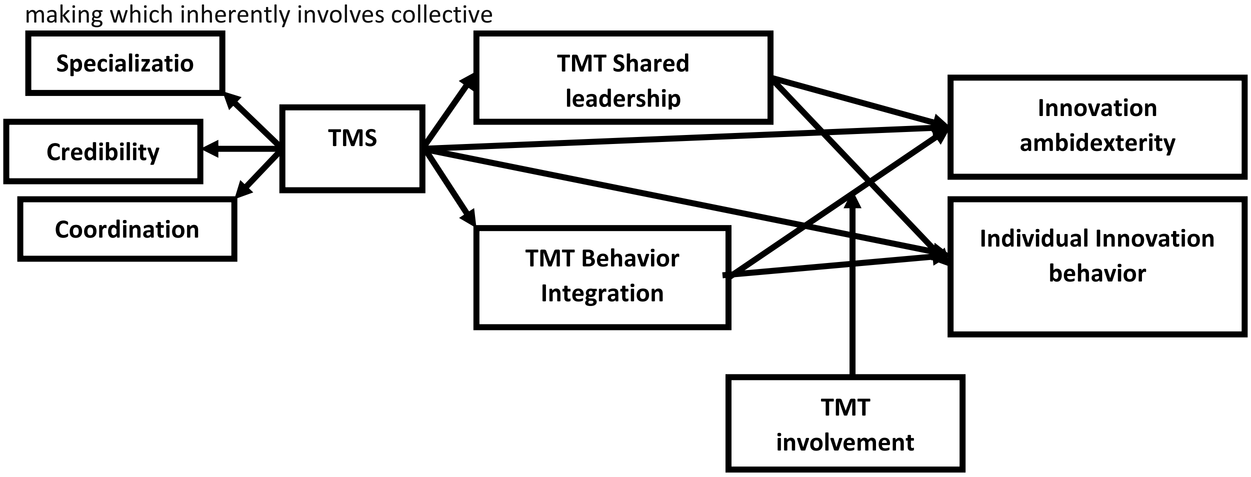

Figure 1. **Research Model**

An organization's strategic focus on ambidextrous innovation is directly formed by TMTs' cognitive resources and behaviors regarding top manager's influence (Hambrick, 2007; D. C. Hambrick & Mason, 1984; C. R. Li, Liu, Lin, & Ma, 2016a). A balanced decision-making process helps TMTs in settling on the strategic choice of innovation ambidexterity, in which resource allocation causes cognitive conflict. In particular, ambidexterity research has highlighted the differentiation–integration challenge for TMTs to enable ambidexterity (Smith & Tushman, 2005).

Executives' ability to distinguish between exploratory and exploitative knowledge and perspectives creates differentiation (O'Reilly & Tushman, 2013). The solution of differentiation is connected to TMTs' cognitive resources (Laureiro-Martínez et al., 2010) since cognitive biases in decision-making generate rational judgments of how managers understand a situation, seek information, and creates decisions (Ehrlinger, Readinger, & Kim, 2016; Smith & Tushman, 2005). For example, (C. R. Li, Liu, Lin, & Ma, 2016b) stated that TMT task-related diversity causes a conflict of knowledge for differentiation ambidexterity, which requires managers to display cognitive ability both exploratory and exploitative innovations. (Keller & Weibler, 2015) Indicate a positive interrelation that leaders who have a good cognitive strain will consider exploration and exploitation as complementary actions. (H. E. Lin & McDonough, 2014) showed that ambidextrous cognitive frames play an important role in generating innovation ambidexterity, and different cognitive styles were found to impact different types of learning. (Mom, Fourné, & Jansen, 2015) stated that managers' ambidexterity contributes more to individual performance in uncertain and interdependent work contexts. Although cognitive factors are conducive to ambidexterity, Hambrick, and Mason suggested using TMT's diverse demographic trait and style composition instead of conceptualization cognition (Jansen, García-granero, & Fern, 2017). Thus, the number of evidence and discussions of how a top management team's (TMT) 's cognition addresses the differentiation challenge remains limited (Hambrick, 2007; C. R. Li et al., 2016a). The current study discourses this gap by exploring how a TMS affects ambidextrous innovation.

In addition to the differentiation challenges, executives also require to address the integration demand of ambidexterity (C. R. Li et al., 2016b). Involvement in strategic decision-making activities can help TMTs to master the difficulty of integration challenges, which depend on the top manager's integrative ability to hold the tensions between conflict cognitive resources and maintain their heterogeneity (Smith & Tushman, 2005). The senior manager's ability depends on their behavior, enabling them to deal with information and decision alternatives, handle conflict and ambiguity, and implement both incremental and revolutionary change (Tushman & O'Reilly, 1996).

Executives' behavioral integration has been examined as one of the behavioral processes to capture TMT integrative ability (Jansen, Tempelaar, van den Bosch, & Volberda, 2009a; Lubatkin, Simsek, Ling, & Veiga, 2006), besides team learning (H. E. Lin & McDonough, 2014; H. E. Lin, McDonough, Lin, & Lin, 2013) and debate (C. R. Li et al., 2016a). Yet, mentioned variables explain only specific features of the TMT's practice (Wei & Wu, 2013), as well as other comprehensive theories and concepts reflecting the nature of TMT integrative capacity is required. We argue that TMT shared leadership behaviors can define an executive's behavioral processes. For instance, behavioral integration is considered a consequence of shared leadership, affecting team performance by three aspects of joint decision making, information exchange, and collective behavior (Sousa & Van Dierendonck, 2016).

Similarly, Day et al. (2004) disclosed that a logical extension to consider the possibility of team learning is that teams must build team leadership capacity. In general, learning is often antecedent to adaptation. Finally, the TMT debate encourages managing conflicts through executives' collective decision-making behaviors that control decisions value and quality (Van Knippenberg, University, Carsten, De Dreu, & Homan, 2004). Thus, all of them represent the outcome but are not the crucial practices of the TMT shared leadership.

Transactive memory system

A TMS is an active group cognitive system and a knowledge-sharing structure for organizations, made to sustain competitive advantages in today's dynamic and knowledge-based business environment (Liu, Zhou, Liao, Liao, & Guo, 2019).

TMS concept catches the interest of management, psychology, and communication contexts (Ren & Argote, 2011).

TMS is conceptualized by two components, the differentiated but complementary knowledge of experts and the distributed knowledge of "who knows what" (Mell, Van Knippenberg, & Van Ginkel, 2014; Wegner, 1987b). TMS is a combination of three differentiated sub-constructs, which are specialization, credibility, and coordination (Cao &

Ali, 2018):

(1) Specialization: each team member has differentiated knowledge of a specific area (Lewis & Herndon, 2011; Wegner et al., 1985)
(2) Credibility: each team member trusts other's knowledge and accepts suggestions from others comfortably.
(3) Coordination: members work together in a well-coordinated fashion to do tasks smoothly and efficiently. It's teams' adaption to encoding, storage, and retrieval of knowledge relevant to the task (Lewis & Herndon, 2011; Wegner et al., 1985). The researchers (Zhang, Hempel, & Tjosvold, 2007) prove that coordination of expertise with different backgrounds highly affects team effectiveness.

Compared with the team mental aspect, TMS is more consistent with emergent cognition that emerges from human knowledge that predicts the team's outcomes to reach differentiation (DeChurch & Mesmer-Magnus, 2010).

A little attention is relatively received regarding TMS's role in innovation ambidexterity (Dai et al., 2017; Heavey & Simsek, 2014). And thus, the understanding of how TMS presents the differentiation challenge of ambidexterity remains unclear. More importantly, related studies declare that TMS can allow subsequent information integration, in which TMS will meet both differentiation and integration requirements. For example, (Lewis & Herndon, n.d.) proposed that higher performance by groups with TMS will be credited to the degree of how differentiated knowledge they have regarding diversity and depth of knowledge possessed.

However, TMS investigations highlight that TMS cannot continually allow effective integration of information, particularly in top management contexts. For example, organizational cultures, thereby increasing group heterogeneity, may result from the team member's conflict and less effective team performance (Paul, Seetharaman, Samarah, & Mykytyn, 2004). Moreover, psychological barriers and relational conflicts might show by the team's knowledge heterogeneity (Van Knippenberg et al., 2004). As Lewis (2003) proposed, TMS's may have poor communication complications, an absence of serious discussion, and comprehension of information (Wegner, 1987a). Furthermore, (Olabisi & Lewis, 2018) proposed overlapping knowledge caused by lack of members awareness, so they do not find credibility in other members' expertise, so the team's knowledge becomes less differentiated, and TMS may not recover. Second, team members in a TMS have some hitches that create dysfunctional, like hidden coordination between each other besides being overconfident of others' credibility (Peltokorpi & Hasu, 2014a).

Additionally, team members may become overloaded with shared information and may not be able to deal with this information effectively, which will cause cognitive inefficient, where group members discuss only tangential matters related to the task, which consumed a long time in the detailed elaboration of ideas rather than producing new ideas. (Baruah & Paulus, 2009). In this situation, the initiative act of integrating information contributed by group members will be restrained (Ren & Argote, 2011). Third, considering the nature of administrative settings, (Heavey et al., 2015) argued that Top teams could display a range of dysfunctions like relational conflict, succession tournaments, frequent turnovers, and competition for scarce resources called transactive "baggage" memory.

The tactical initiative's defeat could leave black spots in some members' transactive memory for years (Heavey et al., 2015). (Donald C. Hambrick, Cho, & Chen, 1996) said that TMT could deliver a meaningful basis to be productive like (a cognitive division of labor), unproductive like (extreme reliance on others), and destructive like (baggage memory) transactive memory in TMTs.

In short, the integration of management functions into the TMS model is possible (Jackson, 2011). Although team members in a TMS can share others' expertise, conflicts may slow down their ability to cohesively share and integrate each other's unique information, which will cause dysfunctionality (Liao, Jimmieson, O'Brien, & Restubog, 2012). Accordingly, TMS alone is not enough to meet the ambidexterity integration requirement. As (Heavey & Simsek, 2014) proposed, a highly developed TMS team may process various information. Still, the existence of the team member's conflicts will lead to an inability to pursue ambidexterity. Therefore, further study must be done to the effect of TMS on ambidexterity, particularly how members successfully and effectively integrate differentiated knowledge of the TMS. This study reflects the direct effect of TMS on ambidexterity and the indirect effect of TMS on ambidexterity through the mediator TMT shared leadership.

Transactive memory system and innovation ambidexterity

As discussed before, one of the greatest challenges in developing ambidexterity is that it requires TMTs to have differentiated cognition between explorative and exploitative activities. However, the pursuit of an ambidextrous orientation entails two overarching complications (Heavey & Simsek, 2014). The first one is that TMTs experienced an absence of the ability to make strategic decisions because “cognitive biases describe how executives recognize a situation, pursue information, and take final choices” (Smith & Tushman, 2005). The second one is the top managers' tendency to stay around a single perspective, especially the known and familiar areas. To achieve ambidexterity, TMT should overcome forces of consistency that cause loss of precision and allow the coexistence of inconsistency (O’Reilly & Tushman, 2013).

A TMS adds an enriched awareness with a various knowledge base and encourages strategic solutions of TMTs to minimize restrictions that obstruct the existent of differentiation. On the one hand, a TMS differentiates team experience and knowledge according to each member's specialization from different domains (Ren & Argote, 2011). Top managers draw a TMS by using each other as external cognitive to gain diverse information that affects decision-making. This specialization and shared expertise awareness reduce knowledge overlaps and allow cogitative sharing, thereby allowing executives to hold a greater amount of task-related information, as specialization refers to the level of memory differentiation inside a team (Peltokorpi & Hasu, 2016). Thus, both the depth and diversity of knowledge possessed by members and applied to the group task will be higher as TMTs improve TMS (Lewis & Herndon, 2011). The enriched knowledge base leads to a complex cognitive paradigm (Tushman & O’Reilly, 1996), which deeply encourages executives to pursue ambidexterity more efficiently, making trade-offs between exploration and exploitation a necessity (Hansen, Wicki, & Schaltegger, 2019; H. E. Lin et al., 2013).

On the other hand, the theory of upper echelons supports the idea that organization behavior is the reflection of its top managers’ interpretation of their environment (D. C. Hambrick & Mason, 1984; Luo & Lin, 2020). Thus, the strategic managerial orientation is affected by TMT’s cognition and decision-making. TMTs with a well-developed transactive memory has responsibility for interpreting the competitive environment for top managers based on their knowledge and expertise (Heavey et al., 2015). Transactive memory allows for an attentional division of labor; the division of labor is beneficial to boost team productivity, as it better controls resources to facilitate interpretations of market change. Regarding today’s ambiguous and rapidly changing business environment, TMTs can identify golden opportunities and strong motivation to utilize their transactive memory systems and reach beyond their current knowledge and think out of the box (Zheng, 2011), thereby prevent the improvement of groupthink harmony (Heavey et al., 2015). Thus, TMTs with a TMS focus on exploring and exploiting a crucial example of strategic paradoxes (Smith, 2014). Therefore, TMS can support TMTs to overcome the differentiation requirement of the ambidexterity problem.

H1: *The existence of the TMT transactive memory system has a positive effect on innovation ambidexterity.*

The mediating role of top management team shared leadership

The fundamental principle of upper echelons theory is that TMT’s experiences, behaviors, values, and characters are formed based on top manager’s interpretation of the organizational situations, according to their cognitive style that affects their decisions (Hambrick, 2007). In other words, executive cognition performs as a structure that guides team members’ behaviors, as behaviors cannot occur solely (DeChurch & Mesmer-Magnus, 2010). The theory proposed that executives are a crucial causal factor of the performance based on behavioral factors; upper echelons use bounded rationality as a foundation to shape strategic decision making. (Cannella & Holcomb, 2005; Gauthier, Cohen, & Meyer, 2019). Thus, organizational strategic choices come from the top leaders, which obliges leaders to have cognitive and behavioral complexity and flexibility (Boal & Hooijberg, 2000a). Using this logic, we observe the cognitive structure, leadership behaviors, strategic decisions connected with the TMT context. Specifically, TMT shared leadership is conducive to collective discussion and integration of top managers’ knowledge to reach a co-decision (Mihalache et al., 2014).

We consider it a mediator between TMS and Innovation ambidexterity because it determines the collective decision-making activities over top manager integration to decision alternatives (Day, Gronn, & Salas, 2004; Mihalache et al., 2014). Thereby, it can promote ambidexterity by making comprehensive decisions. (Q. Chen & Liu, 2018) .

A willingness to have productive cooperation and do interdependent activities among teams appeared to be an essential condition for shared leadership to occur (Engel Small & Rentsch, 2010;

Peeters, Salaga, & Juravich, 2015). A TMS affects the emergence of shared leadership in two ways. First, cognition interdependence to a certain degree is the hallmark of TMS (Wegner et al., 1985) as cognition interdependence indicates that the manager's knowledge and cognition are mutually dependent on each other (Brauner & Becker, 2006).

The scope of expertise domains is wide. Thus meta-knowledge may be considered a zone for expertise worth specializing in (Mell et al., 2014). Managers with a TMS take responsibility specialized division of cognitive team members, which relates to the encoding, storage, and retrieving of their field of knowledge (Choi, 2020).

The manager alone cannot fully understand the conditions that face an organization, especially in a dynamically complex situation. Therefore, each top manager must rely on others to solve the cognition gap shown in recent strategic change and Innovation (Friedrich, Griffith, & Mumford, 2016). In this manner, a TMS forces discussion and integrating information on different executives' specialized tasks. Thus, a TMS cognition interdependence formulates a shared mental model and interacts with sense giving and sense-making activities of TMTs' (Mumford, Friedrich, Vessey, & Ruark, 2012). Thereby employ shared leadership that possesses follower's empowerment. Second, top managers with assigned administrative duties using a TMS trust the credibility of others' information and knowledge brought to the table. Trust indicates the range of how much members are confident in the reliability, dependability of information, and its effect on future actions, based on previous experiences of their peers (Maurer, 2010).

The TMTs' with a cognition-based trust may directly influence team power and indirect influence on team psychological safety, influencing their performance (Schaubroeck, Lam, & Peng, 2011). As (Engel Small & Rentsch, 2010), findings contribute to a better understanding of team trust emergence and behavioral consequences in teams, like risk-taking behaviors. Thus, TMS stimulates TMT members' willingness to involve in shared leadership behaviors (Breuer, Hüffmeier, Hibben, & Hertel, 2020). Accordingly, the concept of shared leadership encourages Innovation ambidexterity. First, reliable leadership is mostly beneficial when shared among team members, considering each member's contributions, needs, and suggestions to harmonize managerial decisions (Hmieleski, Cole, & Baron, 2012). Such inclusiveness in the decision-making practice may provide valuable insights into conflicting strategic plans as a fragment of the integration criterion of ambidexterity.

Second, by intensive effort to get needed information and enhance joint decision-making in the system, shared leadership prevents limited vision scope and stops interactive conflicts (Friedrich, Vessey, Schuelke, Ruark, & Mumford, 2009).TMT experiences can be used more effectively in this condition, as it encourages managers to explore new skills and new opportunities to utilize various information to reach Innovation (Smith & Tushman, 2005). Finally, on the team level decision-making process, the collective practices of the interaction of shared leadership encourage top managers to analyze issues more intensely, which in turn decreases interpersonal conflict, facilitates negotiation, and inspires senior team members to openly discuss conflicting issues and overcome strategic discrepancy (Jansen et al., 2009a). Consequently, we assume :

H2a: *TMT transactive memory system has a positive effect on TMT shared leadership*

H2b: *TMT shared leadership has a positive effect on innovation ambidexterity*

H2c: *TMT shared leadership mediates the positive relationship between TMT transactive memory system and innovation ambidexterity.*

H2d: *TMT shared leadership mediates the positive relationship between TMT transactive memory system and individual innovation behavior.*

The mediating role of behavioral integration

An organization's strategic attention to innovation ambidexterity is directly formed by TMTs'cognitive resources and behaviors (Hambrick, 2007). Researchers have studied numerous behavioral activities to capture TMT's integrative ability, such as behavioral integration (Jansen, Tempelaar, van den Bosch, & Volberda, 2009b; Lubatkin et al., 2006).

(Nonaka, Byosiere, Borucki, & Konno, 1994) Argued that "although ideas are formed in the minds of individuals, interactions typically play a critical role in developing these ideas." In sum, a behaviorally integrated TMT acts as a forum in which TMTs can flexibly and freely exchange contradictory information, resolve conflicts, and expediting the firm's development level of ambidexterity.

We propose that TMS have an obvious relationship with behavioral outcomes. Behavioral outcomes (Ren & Argote, 2011) contain behavioral and cognitive factors (behavioral integration, team learning, team creativity, and knowledge sharing). This is consistent with our hypothesis that TMS development allows team members to build a mutual knowledge base to collect information from different team members, facilitating integration (Zhou & Pazos, 2020).

TMS is theoretically and empirically connected with team creativity and team innovation (Peltokorpi & Hasu, 2014b). the researcher (Wegner, 1987b) suggested that negotiations between differentiated TMS members produce creative products. Consequently, (Qian Chen, 2018) hypothesized that the existence of a TMT transactive memory system has a positive relationship with innovation ambidexterity.

H3a: *TMT behavioral integration mediates the relationship between TMT transactive memory system and innovation ambidexterity*

People's social relationships in different situations mutually influence and depend on each other's emotions, motivation, behavior, and cognition. (Brauner & Becker, 2006).

Knowledge sharing refers to distributing knowledge into its proper location and transferring it to a place where knowledge is needed. Therefore, a well-developed TMS likely to pull knowledge from individuals effectively. Past studies on TMS show that a strong TMS can lead to effective knowledge sharing among team members (Choi, 2020). Referring to (Wang, Yang, & Xue, 2017) talked about knowledge sharing and innovation behavior, where knowledge sharing refers to activities that individuals send or receive information from others, which leads to generating new ideas.

Many studies have demonstrated the importance of knowledge-sharing behavior in supporting and enhancing innovation. For example,(Chi & Holsapple, 2005) supported that knowledge sharing's critical function is to maintain innovation. An individual who shares knowledge with their colleagues will generate innovative ideas, concepts, processes, and activities.

The researchers (Fan et al., 2016) hypothesize that individuals are motivated to actively enjoy tasks when they observe a fully developed TMS within the team.

TMT behavior integration's goal is to achieve the concept of "two heads are better than one." Furthermore, The researcher (Fan et al., 2016) assumed a linkage between TMT'S behavior integration and innovation. Thus. We hypothesized that:

H3b: *TMT behavioral integration mediates the relationship between TMT transactive memory system and individual innovation behavior.*

Transactive Memory System and individual innovative behavior

Both creativity and innovation were acting as integral parts of the similar practice, as creativity studied stages of generating unique and distinctive ideas, while innovation included the latter phase of idea implementation by following subsequent practices to improve organizational performance and to ensure long term survival (Anderson, Potočnik, & Zhou, 2014).

Individuals can be ranged from those who can do things "better" to those who can do things "differently" and reflecting solutions to a similar problem (Kirton, 1976). Innovation is observed as a multistage process, with different individual behaviors at each stage, starting from problem recognition and then engaging of solutions, following by creating a group of supporters; in the last stage, an innovative individual completes the idea by producing a real model of the innovation (Scott & Bruce, 1994).

When team members are aware of the concept map of "who knows what," they will develop their present knowledge or create new competencies (Argote & Ren, 2012). For the management practice component, TMSs can increase teamwork effectivity and constructive interaction among team members. The researchers (Heavey & Simsek, 2014) used the creative concept friction that reflects members' transaction of non-redundant knowledge to accelerate discovering new information and thoughts, leading to "reflective reframing" managers consciously consider previous knowledge may contain alternative meanings.

Overall, a highly developed TMS environment will force members to touch a deep engagement level of innovation. Therefore, we hypothesize that team members are motivated to be actively involved in job tasks when they perceive a high TMS level.

H4: *TMT transactive memory system has a positive effect on individual innovation behavior*

Researchers have examined numerous behavioral practices to broaden TMT's integrative ability, such as behavioral integration (Q. Chen & Liu, 2018). On the other hand, they found difficulty arguing whether performance is a cognitive or behavioral component of TMS or both (T. C. Lin, Hsu, Cheng, & Wu, 2012).

TMT behavioral integration and organizational ambidexterity

The research proposes that TMTs influence ambidextrous orientation through decision-making abilities to meet the demands and to balance short- and long-term outcomes of ambidextrous firms (Carmeli & Halevi, 2009)

A substantial body of research identified the impact of TMT characteristics on strategic choices and organizational performance (Gauthier et al., 2019), top managers' cognitive perspectives, as reflected in a team's demographic characteristics (Wiersema & Bantel, 1992), cognitive diversity, and how it bonds to firms' performance (Bergman, 2020) and managerial discretion (Finkelstein & Hambrick, 1990), as important factors have been assuming, increasingly, a key role in determining the innovation strategies of an organization. Furthermore, existent literature observed that top managers' paradoxical structures, besides behavioral mechanisms that facilitate ambidexterity in a firm (Raisch et al., 2009; Wilms, Winnen, & Lanwehr, 2019). research suggests that top managers can take opportunities by reconfiguring the existing competencies, formal structural and personal coordination mechanisms (Mom, van den Bosch, & Volberda, 2009; O'Reilly & Tushman, 2011) as the main predictors of an organization's ambidexterity. However, Previous studies have not widely examined the exact nature of how TMT processes enabling ambidexterity.

Some of these mechanisms motivate TMTs to share knowledge, collaborate and make joint decisions, leading to ambidexterity orientation (Bosch & Volberda, 2014; Lubatkin, Simsek, Ling, & Veiga, 2008)

TMT behavioral integration theory proposed by Hambrick (1994) focuses on the collective interaction of TMT's behavior, ideas, value and judgment, and practices of collaborative behavior, information exchange, and joint decision-making over mutually interdependent team practices. Using collective mental and cognitive frames within the TMT to understand each condition and decide behavior to react (Smith & Tushman, 2005). Meanwhile, behaviorally integrated TMTs display superior task and social interface their shared mental and cognitive processes will accept and deal with the contradictory strategic demands of exploration and exploitation in an organization (Lubatkin et al., 2006)

In other words, with shared mental and cognitive structures, TMTs develop a shared knowledge of the expectations, choices, substitutes, and consequences of explorative and exploitative innovation strategies. Similarly, having a shared understanding of the cognitive processes, TMT shapes ambidexterity in an upgraded way by integrating the knowledge and manage resources of a firm (Smith & Tushman, 2005). Consequently, behaviorally integrated TMTs empower organizations to meet ambidextrous innovation demands by promoting a balance simultaneous of both explorative and exploitative learning.

Recently, studies on TMT behavioral integration enhanced organizational ambidexterity (Bueller, Carmeli, & of Strategy, 2015). For example, Pelaez and Mohan (2013) studied a behaviorally integrated TMT and how it affects software development, underlined the significance of collaborative behavior in the TMT for timely replies and serious decisions on innovation strategies. Enhanced rich and accurate information exchange enables the TMT to hold conflicting points of view and avoid groupthink (Carmeli, 2008)

Joint decision-making or participative decision-making empowers the TMT to differentiate and integrate into explorative and exploitative strategies (Raisch et al., 2009). A behaviorally integrated TMT helps to successfully implement an HR system in a firm, improve staff's abilities, and motivate staff for ambidextrous learning. Consequently, behaviorally integrated TMTs are better composed to achieve ambidexterity in an organization. (Tsao & Wang, 2014)

Hambrick (1994) proposes that lower behavioral integration in the TMT will lead to organizational problems. A behaviorally disintegrated TMT shares only a small amount of information leads to conflicts and, consequently, organizational decline (Mooney & Sonnenfeld, 2001). In summary, a behaviorally integrated TMT, which involves collaborative behavior, joint decision-making, and information exchange, better manages the demands of exploration and exploitation strategies, thus creating an ambidextrous firm. Hence, we hypothesize that:

H5: *TMT Behavioral Integration has a positive effect on innovation ambidexterity.*

Moderating Role of TMT Involvement

TMT behavioral integration affects organizational ambidexterity by allowing contradictory cognition among TMTs (Lubatkin et al., 2008). Logically, when a TMT puts itself in the innovation practices and provides the needed support regarding resources, it will enhance behavioral integration and consequently will affect organizational performance. High TMT Involvement leads to better member's behavioral integration. Also, to better predict market demands, collaborate to make joint decisions, exchange information, and apply the explorative opportunities and exploitative competencies (Heavey et al., 2015). Hence, in this study, we argue that an involved TMT will increase an integrated behavioral effect on organizational ambidexterity.

Even though previous studies haven't focus on TMT involvement and behavioral integration on ambidexterity, we will test these variables in this study. We propose that TMT behavioral integration positively affects organizational ambidexterity. Whereas TMT behavioral integration's effect on ambidexterity through the conditions of social cognition and resource availability. Furthermore, in this paper, we proposed the following hypothesis:

H6a: *TMT involvement moderates the relationship between TMT behavioral integration and innovation ambidexterity*

H6b: *TMT involvement moderates the relationship between TMT behavioral integration and individual innovation behavior*

Numerous studies discuss TMS as a knowledge map that properly lists the exact location of knowledge. In contrast to past studies, the three main perspectives of TMS are adopted in this study. The specialty dimension contains not only knowing the location of information but also the distinctiveness of this expertise. It proposes that individuals in a team have various areas of expertise, as members do not have to expend extra effort and time searching for information (Lewis, 2004). Specialty contributes to team behavioral integration in many methods as it enables knowledge integration between team members (Alavi & Tiwana, 2002). The effect of member integration is controlled by how individuals in one team distinguish required information. (T. C. Lin et al., 2012). The second construct is the joint decision adopted to ease timely responses to changes, using members' various opinions to enrich involvement, which will allow team members to integrate and apply knowledge in a coordinated way by making decisions together. In sum, knowing the knowledge location helps to contribute a better teamwork practice through effective communication.

Member integration entails not only heterogeneity but also the credibility of expertise. If there is a lack of knowledge credibility, a solid barrier will exist to knowledge exchange (Szulanski, 1996). Hence, credibility can support a quick integration process.

To present researchers' arguments on the best way, we propose that TMS dimensions positively impact team behavioral integration. Thus, we hypothesize that:

H7: *TMT transactive memory system has a positive effect on behavioral integration*

Previous literature has observed the influencing factors of individual innovation behavior from diverse management and psychological aspect, such as innovation (Scott & Bruce, 1994), transactive memory systems (Fan et al., 2016), and transformational leadership (V. Li, Mitchell, & Boyle, 2016). Recently, TMT shared leadership starts gradually emerged and explored in social studies. Furthermore, the impact of shared leadership on individual innovation behavior has not been fully investigated. Most of the definitions of leadership reflect three basic components, containing "group," "impact," and "goal"(Boal & Hooijberg, 2000b). (Mei & Wang, 2013) defined share leadership as "a dynamic, interactive group influence process, which encouraged between team members and provided positive feedback, and achieved target through the continuous communication and constant action in the process." This kind of interaction could help to improve team performance on an individual level.

The complex leadership behavior has been seen as an individual level perspective, regarding their ability to do multiple roles and perform these leadership roles on their way (Carmeli & Halevi, 2009). TMT-shared leadership has a distinct impact on team performance, and it is used as a predictor of team effectiveness (Pearce & Sims, 2002). In other words, shared leadership considers as participative leadership (Pearce, 2004). Since it is connected with innovation and creativity, on the other hand, innovation capability is an intangible asset that organizations exploit to reach innovations. (H. E. Lin & McDonough, 2011)

We argue that TMT-shared leadership focus on team psychological condition, to be able to independently lead themselves and share responsibilities, such a kind of leadership push team members to engage in innovative task behaviors, experimentations, and think out-of-box (Donate & Guadamillas, 2011), which will improve competencies among team members, who are programmed to use innovative technologies in their work activities (Kwon & Cho, 2016; O'Cass & Sok, 2013; Rosing, Frese, & Bausch, 2011).

An individual with higher shared leadership ability is more likely to take on extra roles and tasks (Boehm & Lyubomirsky, 2008) and have more achievements and better work performance (Russell, 2008). Therefore, it is necessary to fully explore the effect of shared leadership on individual innovation behavior. Shared leadership allows employees to incorporate ideas and suggestions into decisions to reach qualified, innovative output (De Jong & Den Hartog, 2007).

(Carson, Tesluk, & Marrone, 2007b) found that shared leadership could improve team performance and bring a competitive advantage to the organization. Mei (2012) compared the power sources of formal and informal leadership, then stated that shared leader influenced other team members by their professional skills and personality charm, motivated the team members to high-level need by helping team members set challenging goals, and set an example for them, and sacrificed personal benefits when necessary.

The core of leadership in general lies in the aptitude to influence employees' willingness to involve a work context; by using creativeness (Anderson, De Dreu, & Nijstad, 2004) from the individual point level, this study will explore the direct effect between the role of TMT shared leadership and individual innovation behavior. Therefore, we predict:

H8: *TMT shared leadership has a positive effect on individual innovation behavior*

Integration and innovative behaviors are described as the extent to which different units and members of a firm communicate and work in an interrelated manner (Germain, 1996). Integration enhances interaction and communication (Moenaert & Souder, 1990), Knowledge sharing, collaboration, and harmonization among various elements (Song, Montoya-Weiss, & Schmidt, 1997). (Shu, Page, Gao, & Jiang, 2012) stated that team member's interaction, knowledge exchange, and knowledge combination would directly lead to innovation. When there is a higher level of knowledge discussion and exchange, team members will have more opportunity to access knowledge different from their own; therefore, this will automatically generate innovative and new ideas (lkujiro Nonaka, 1991). Scholars have noted that integration enhances the knowledge distribution (Rulke & Galaskiewicz, 2000) and stimulating innovation (Kogut & Zander, 2009; Madhavan & Grover, 1998; Sherman, Berkowitz, & Souder, 2005). Furthermore, integration enables innovation by forming a platform for combining diverse expertise and skills (Tang, Pee, & Iijima, 2013), crucial for innovation (Tang et al., 2013). Furthermore, an integrated structure helps deal with different mindsets in a different context (Brown & Eisenhardt, 1995). Thus, we believe that a higher level of behavioral integration in the team will likely enhance their innovative abilities and look for new technologies, techniques, processes, and ideas. Consequently, we have suggested the following hypothesis:

H9: *TMT behavioral integration has a significant effect on individual innovation behavior*

Method

Sample and data collection

We collected our data from Top managers in Palestinian banks in, west-bank area. The respondents are executives who have a huge influence on forming and implementing organizational strategies. We chose presidents, vice presidents, general managers, regional managers, CEOs, and CFOs. We randomly selected 210 top managers as a sample, based on Palestinian monitory authority PMA reports. The questionnaire was developed as an English-language version.

Generally, the obstacles of research method biases are critical in the behavioral sciences. To reduce the potential for common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), we temporally separated the independent variable's measurement from the mediating and dependent variables by about one year. In December 2019 (Time 1), questionnaires were distributed to the top managers containing the independent variable's measurement, asking them to distribute the survey to other executives (including CEOs) of their team. Responses were received from 124 candidates, representing a response rate of 59 percent. In November 2020 (Time 2), a second questionnaire was sent to the same respondents to measure dependent variables, mediators, and moderators. We implemented a confirmatory factor analysis (CFA) to assess the multi-item constructs to ensure discriminant validity.

Our study used the non-probability and convenience sampling technique, deductive design, and a quantitative and descriptive-analytical approach. We used the survey instrument (structured questionnaire) across two periods (with each period measuring a part of the model). Items were measured in a five-point Likert scale varying from strongly disagree = 1 to strongly agree = 5. The questionnaire contained four main sections; the first section was the cover letter. The next was a screening question; while the third section was demographics information (Gender, Age, Educational level); the following section measures the independent and dependent variables (Transactive memory system, Innovation ambidexterity, Individual innovative behavior); within the same section, we consider two mediators (TMT shared leadership, TMT Behavioral Integration) and one moderator as well (TMT Involvement). Before collecting the data, a pilot test was performed on 30 samples to ensure that the survey is clear and applicable. And finally, ethical approval for this survey was obtained from the authors' affiliated institution.

Measures
All data on the continuous variables were collected on a five-point Likert scale.

We collected data for this study using survey instruments adapted from previous literature. The questionnaires used in this study were initially developed in English and revised several times to avoid bias and ensure validity. In particular, we adopted the following scales: TMS (Lewis, 2003) 15 items scales, TMT shared leadership (Mihalache et al., 2014), an 8-item scale, TMT Behavioral Integration (Simsek et al., 2019), a 9-item scale, Innovation ambidexterity (Venugopal, T.N, & Kumar, 2018) a 12-item scale, Individual innovative behavior (Scott & Bruce, 1994), and finally, TMT Involvement (Venugopal et al., 2018) a 5-item scale.

Results and analysis
Descriptive Profile of the Respondents

The characteristics of the respondents in the table below include gender, age, and educational level, are presented in Table 1.

Table 1. **Descriptive Profile of the Respondents**

Demographic Variables	Categories	Frequency (n=124)	Percentage
Gender	Male	84	67.7
	Female	40	32.3
Age	18 - 30 years	8	6.5
	31 - 40 years	49	39.5
	41 - 50 years	42	33.9
	51 – 60 years	20	16.1
	60 years & Above	5	4.0
Educational level	Bachelor’s	46	37.1
	Master’s	55	44.3
	Doctorate	15	12.1
	Others	8	6.5

Source: *Computations from Survey Data, 2020*

The gender distribution demonstrates that most of the respondents were male, accounting for approximately 68% of total responses, with the remaining 32% of respondents being female. Approximately 73% of the respondents were between 31 and 50 years of age, while respondents older than 50 years constituted approximately 20%. This indicates that top management team members within the Palestinian Banking sector are usually below 50 and mostly between 31 and 40 years of age. While very few of the respondents hold doctorate degrees (12.1%), most of the respondents had either a bachelor’s degree or a master’s degree (81.4%), with most of this group (39.5%) holding a bachelor’s degree.

Measurement Model

The table below presents preliminary tests conducted on the measurement model to ascertain its psychometric properties. The assessment of the measurement model is the first stage in the conduct of a structural equation model. It is geared toward assessing how accurately observe items measure the underlying latent constructs in the model. In particular, it examines convergent and discriminant validities of the underlying item-construct relationships. In line with (Joe F Hair, Risher, Sarstedt, & Ringle, 2019) item-construct, convergent validity is examined by assessing the outer loadings, the composite reliability, the average variance extracted, the_A values, and the Cronbach’s Alpha values. In conformity with (Al-Busaidi, 2012), all of the loadings were above the recommended 0.4 (W. S. Lin & Wang, 2012) and 0.5 (Al-Busaidi, 2012) benchmarks. Similarly, values for composite reliability, Cronbach’s alpha, and rho were all greater than the recommended 0.70 (Dijkstra & Henseler, 2015; J. Hair, Hollingsworth, Randolph, & Chong, 2016; Joseph F. Hair, Black, & Babin, 2006), signifying confirmation of the presence of convergent validity among observed items and their latent constructs.

Using a combination of (Fornell & Larcker, 1981) square root of AVE and (Dijkstra & Henseler, 2015) heterotrait-monotrait (HTMT) ratios, we assess the model for discriminant validity. As the table below reveals, as required by (Fornell & Larcker, 1981), the square root of AVE represented by the figures in the diagonal are larger than the inter-construct correlations for each of the variables, except the TMS variable where the square root of its AVE (0.785) is less than its inter-construct correlations with IA (0.788) and Co (0.927). Thus, the use of (Fornell & Larcker, 1981)) procedure confirms the presence of discriminant validity for all but one of the constructs.

We, however, find from extant validity research that (Fornell & Larcker, 1981) procedure has faced intense criticisms over its inability to not only be consistent in the establishment of discriminant validity but, importantly, its inability to establish the absence of discriminant validity (Dijkstra & Henseler, 2015). One of the primary sources of these criticisms (Dijkstra & Henseler, 2015) then developed and demonstrated a more superior approach to detecting discriminant validity called the hetrotrait-monotrait HTMT method. In this method, discriminant validity is established if HTMT ratios fall below the most lenient threshold of 1.0 (Dijkstra & Henseler, 2015), or the averagely lenient threshold of 0.90 (Gold, Malhotra, & Segars, 2001), and the most conservative threshold of 0.85 (Rex B. Kline, 2015). Again, as shown in table 3 (figures in italics above the diagonal), all of the HTMT values recorded for each construct fell below the most lenient threshold of 1.0 as recommended by (Dijkstra & Henseler, 2015). Thus, we confirm the presence of discriminant validity of all items to the constructs in our measurement model.

Table 2. **Measurement Model**

Constructs and Indicators	***Loadings (λ)***	**Mean**	**Std. Deviation**	**Skewness**	**Kurtosis**
TMS-Specialization					
TMSS3	0.928***	3.004	1.372	0.016	-1.364
TMSS4	0.915***	3.008	1.383	0.048	-1.352
TMSS5	0.901***	3.096	1.336	0.007	-1.284
TMS-Credibility					
TMSCR6	0.924***	2.963	1.245	0.308	-1.16
TMSCR7	0.936***	2.875	1.383	0.11	-1.278
TMSCR8	0.936***	2.971	1.38	0.03	-1.302
TMS-Coordination					
TMSCO10	0.947***	2.961	1.35	0.157	-1.25
TMSCO12	0.941***	2.906	1.36	0.217	-1.288
TMSCO14	0.942***	2.955	1.349	0.216	-1.266
TMSCO15	0.918***	2.841	1.486	0.141	-1.411
TMT-Shared Leadership					
TMSSL16	0.718***	2.411	1.28	0.566	-0.758
TMSSL17	0.957***	2.493	1.256	0.542	-0.794
TMSSL18	0.828***	2.364	1.317	0.57	-0.901
TMSSL19	0.924***	2.54	1.257	0.55	-0.752
TMSSL20	0.719***	2.352	1.154	0.287	-1.203
TMSSL21	0.941***	2.384	1.275	0.571	-0.844
TMSSL22	0.843***	2.366	1.298	0.579	-0.841
TMSSL23	0.927***	2.558	1.294	0.532	-0.838
TMT-Behavioral Integration					
TMTBIJ25	0.568***	2.108	1.065	1.024	0.635
TMTBIC27	0.626***	2.133	1.019	0.976	0.517
TMTBIC29	0.906***	2.059	1.236	1.673	5.225
TMT- Involvement					
TMTIN51	0.922***	2.961	1.35	0.157	-1.25
TMTIN52	0.962***	2.906	1.36	0.217	-1.288
TMTIN53	0.929***	2.955	1.349	0.216	-1.266
TMTIN54	0.935***	2.841	1.486	0.141	-1.411
Innovation Ambidexterity					
OEXPLR35	0.887***	3.008	1.305	-0.057	-1.131
OEXPLR37	0.940***	2.922	1.351	0.109	-1.227
OEXPLO39	0.894***	2.904	1.336	0.151	-1.179
Individual Innovation Behavior					
IIB45	0.914***	2.761	1.311	0.265	-1.096
IIB46	0.725***	2.652	1.232	0.07	-1.209
IIB47	0.873***	2.605	1.338	0.238	-1.235
IIB48	0.769***	2.759	1.334	0.219	-1.123
IIB49	0.914***	2.712	1.311	0.219	-1.155
IIB50	0.891***	2.589	1.333	0.286	-1.153

Note: * =** $p < 0.01$**.**

Table 3. **Inter-construct correlations, Convergent and Discriminant Validity.**

Variables	CA	rho	CR	AVE	BI	Co	Cr	IIB	IA	SL	SP	TMS	TMTINV
BI	0.744	0.796	0.75	0.511	[a]**0.715**	[b]*0.330*	*0.216*	0.386	*0.353*	*0.255*	*0.361*	*0.361*	*0.330*
Co	0.966	0.967	0.967	0.878	0.311	**0.937**	*0.613*	*0.626*	*0.708*	*0.489*	*0.579*	*0.915*	*0.902*
Cr	0.952	0.953	0.952	0.87	0.208	0.613	**0.933**	*0.522*	*0.631*	*0.417*	*0.644*	*0.892*	*0.613*
IIB	0.941	0.945	0.94	0.724	0.392	0.628	0.524	**0.851**	*0.957*	*0.801*	*0.586*	*0.69*	*0.626*
IA	0.933	0.934	0.933	0.822	0.369	0.708	0.631	0.958	**0.907**	*0.725*	*0.640*	*0.787*	*0.708*
SL	0.959	0.963	0.958	0.743	0.262	0.495	0.422	0.807	0.73	**0.862**	*0.429*	*0.532*	*0.489*
Sp	0.939	0.939	0.939	0.837	0.334	0.579	0.644	0.585	0.64	0.432	**0.915**	*0.879*	*0.579*
TMS	0.941	0.943	0.941	0.617	0.341	0.927	0.882	0.693	0.788	0.54	0.87	**0.785**	*0.915*
TMTINV	0.966	0.967	0.966	0.878	0.312	0.920	0.613	0.628	0.708	0.495	0.579	0.927	**0.937**

Notes: **CA**=Cronbach's Alpha, **CR**=Composite Reliability, **rho**= rho_A reliability indices, **AVE**= Average Variance Extracted, [a]= Diagonal values in bold are the square root of AVE, [b]= *Italicized* values above the square root of AVE are Heterotrait-Monotrait (HTMT) ratios.

As a final act in the assessment of the measurement model, we examine the presence of multicollinearity among the predictor variables in our construct and find, as reflected in the accompanying table below, that all of our constructs had VIF values below the lenient threshold of 10 upon which the absence of multicollinearity can be concluded (Hair Jr., Matthews, Matthews, & Sarstedt, 2017; Sarstedt & Christian M. Ringle, 2017)

Table 4. **Structural Model Multicollinearity (VIF Values)**

Constructs	VIF
Behavioral Integration	3.542
Shared Leadership	1.455
TMS	8.915
TMT Involvement	7.212

Assessing the Structural Model

Upon establishing the convergent and discriminant validities of the measurement instrument, the second stage of the structural equation modeling approach entails assessing the hypothesized structural model (Hair Jr. et al., 2017) in their recommendations for examining structural models, (Joe F Hair et al., 2019) guide the most important observation parameters. They include an examination of the amount of variance in outcome variables explained by predictor variables (R^2), the direct and indirect effects (β coefficients), effect sizes (f^2 *values),* and significance values *(t-values)* generated after the conduct of bootstrapping using approximately 5000 sub-samples.

A summary of the results is provided in table five. An assessment of the direct effects shows that transactive memory systems have positive and significant effects on shared leadership (β = 0.540, p < 0.05)., behavioral integration (β = 0.341, p < 0.05) and innovation ambidexterity (β = 0.483, p < 0.05). However, transactive memory systems did not display any significant effect on individual innovative behavior (β = 0.275, p = 0.079). Shared leadership was found to have positive and significant effects on individual innovation behavior (β = 0.578, p < 0.05), and innovation ambidexterity (β = 0.392, p < 0.05); likewise, behavioral integration also exhibited positive and significant effects on individual innovation behavior (β = 0.295, p < 0.05), and innovation ambidexterity (β = 0.330, p < 0.05).

Having examined the direct effects, we proceed to assess the indirect mediating and moderating effects. First of all, we examine the mediating effects of shared leadership and behavioral integration on the TMS-IIB and TMS-IA paths. The results show that shared leadership significantly and positively mediated the TMS-IIB path (β = 0.312, p < 0.05), and the TMS-IA path (β = 0.212, p < 0.05). However, that behavioral integration had no significant mediating effect on the TMS-IIB path (β = 0.101, p = 0.069) and the TMS-IIA path (β = 0.112, p < 0.076).

Next, and as hypothesized, we find that TMT's indirect moderating effect on the direct effect of behavioral integration on individual innovative behavior was significant but negative (β = -0.327, p < 0.05). However, we find that its moderating effect on the behavioral integration-innovation ambidexterity path was not significant (β = -0221, p

= 0.132).

Table 5. **Results of the Path Analysis**

Hypotheses	***Model Fit Indices:*** *SRMR= 0.08*					
Direct Effects	***B alues***	***T statistics***	***P values***	***f*** ^{2}	R^2	***Decision***
H1: TMS -> Innovation Ambidexterity	0.483	3.028	0.002	0.123	0.787	*Supported*
H2a: TMS -> Shared Leadership	0.540	14.286***	0.000	0.411	0.291	*Supported*
H2b: Shared Leadership -> Innovation Ambidexterity	0.392	7.801	0.000	0.495	0.787	*Supported*
H4: TMS -> Individual Innovation Behavior	0.275	1.756^{ns}	0.079^{ns}	0.037	0.771	*Not Supported*
H5: Behavioral Integration --> Innovation Ambidexterity	0.330	2.093	0.036	0.107	0.787	*Supported*
H7: TMS -> Behavioral Integration	0.341	7.643***	0.000	0.132	0.116	*Supported*
H8: Shared Leadership -> Individual Innovation Behavior	0.578	11.349	0.000	1.003	0.771	*Supported*
H9: Behavioral Integration --> Individual Innovation Behavior	0.295	2.104	0.035	0.144	0.771	*Supported*
Indirect Effects						
Mediating Effects						
H2c: TMS --> Shared Leadership --> Innovation Ambidexterity	0.212	7.045	0.000	-	-	*Supported*
H2d: TMS --> Shared Leadership -> Individual Innovation Behavior	0.312	8.439	0.000	-	-	*Supported*
H3a: TMS --> Behavioral Integration --> Innovation Ambidexterity	0.112	1.770	0.076	-	-	*Not Supported*
H3b: TMS --> Behavioral Integration --> Individual Innovation Behavior	0.101	1.793	0.069	-	-	*Not Supported*
Moderating Effects						
H6a: Behavioral Integration --> TMT Involvement --> Innovation Ambidexterity	-0.221	1.507	0.132	0.127	-	*Not Supported*
H6b: Behavioral Integration --> TMT Involvement --> Individual Innovation Behavior	-0.327	1.974***	0.048	0.054	-	*Supported*

***p < 0.05 (based on two-tailed test)., ^{ns} = not significant

To further buttress the moderation effect of TMT involvement as described above, figure two represents the moderation interaction graph of the significant moderating effect of TMT involvement on the behavioral integration – individual innovation behavior path. The blue, red, and green lines reflect the effect of TMT involvement on the BI-IIB paths when TMT involvement is at three distinct levels: low (-1 SD), mean and high (+1 SD), respectively. It becomes apparent that high levels of TMT involvement dampen the positive effect of behavioral integration on innovative work behavior (green line), while low levels of TMT involvement strengthen the effect of behavioral integration on innovative work behavior. Since we did not find any significant moderating effect of TMT involvement on the behavioral integration-innovation ambidexterity path, no slope diagram is presented.

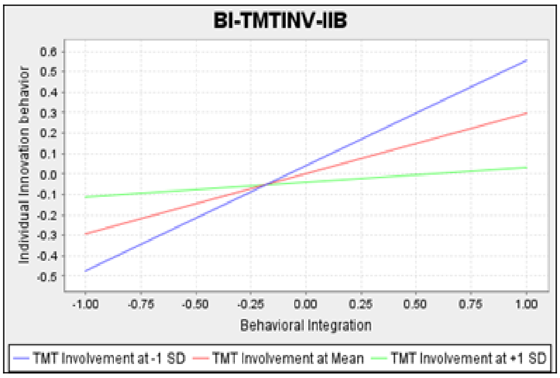

Figure 2. ***Moderating Effect of TMT Involvement on the BI-IIB Path.***

In summary, as shown in the results table, our study finds support for all our hypothesized paths except for hypotheses 1a, 5a, 5b, and 5c. (Sullivan & Feinn, 2012) suggested that in addition to reporting beta coefficients, variance, and statistical significance of the results obtained, the magnitude of the effects or effect sizes (f^2) should also be reported. They also recommend interpreting the magnitude of effects using Cohen's (1988) threshold, which stipulates the designation and quantification of effect ranging from 0.02, 0.15, and 0.35 as small, medium, and large in magnitude, respectively. Using this widely used guideline, we interpret all of our reported f^2 values in the table above to be of substantial magnitude since all of them were above 0.02. More specifically, all of the reported effect sizes were small, falling below the 0.15 threshold but greater than 0.02, except TMS-Shared Leadership (f^2 = 0.411), Shared Leadership-Individual Innovation Behavior (f^2 = 1.003), and Shared Leadership -Innovation Ambidexterity (f^2 = 0.495) which were all above the 0.35 threshold, implying that they are of a substantially large magnitude. Finally, although not absolutely required to be reported in PLS-SEM, the model fit assessment was conducted by observing the SRMR index and, as shown in the table above, the SRMR value of 0.072, fall below the threshold of 0.08 (Hair Jr. et al., 2017) beneath which model fit is established. Thus, we can confirm that the model used in studying the underlying construct fits the data.

Discussion and conclusion

First of all, the results of the replication aspect of this study based on evidence from the Palestinian banking industry upheld the stance of extant literature, especially that of (Q. Chen & Liu, 2018), that TMS has a positive effect on shared leadership and innovation ambidexterity; and that shared leadership while exhibiting a positive effect on innovation ambidexterity also mediates the positive effect of TMS on innovation ambidexterity. Further extending and deepening insights into the black box of the transactive memory systems and organizational outcomes literature, our findings further revealed that TMS positively affects behavioral integration. At the same time, behavioral integration was also found to have a positive effect on innovation ambidexterity. However, unlike shared leadership, behavioral integration did not exhibit any significant mediation effect on the TMS-Innovation Ambidexterity path. Also, moving away from organization-wide outcomes to examining individual outcomes, the study finds that while TMS does not exhibit any significant direct effect on individual innovation behavior (IIB), it did exhibit a significant total effect on IIB. Also, shared leadership not only exhibited a positive and significant effect on IIB but also mediated the non-significant direct effect (but significant total effect) of TMS on IIB, thereby exhibiting an indirect-only mediation effect based on the mediation typology of (Zhao, Lynch, & Chen, 2010) or a full mediation effect according to Baron and Kenny's mediation typology (Zhao et al., 2010). From the individual outcome's perspective, we find that TMS exhibited a positive and significant effect on behavioral integration. Likewise, behavioral integration exhibited a positive and significant effect on individual innovation behavior. However, behavioral integration was not found to exhibit any significant mediating effect on the TMS-IIB path. Finally, we find evidence for the significant moderating effect of TMT involvement on the behavioral integration-IIB path, with high levels of TMT involvement dampening the effect and low levels strengthening the effect.

Theoretical Implications

First of all, this study makes substantial contributions to the extant body of research on the predictors of innovation ambidexterity by examining the predictive ability of transactive memory systems, shared leadership, and behavioral integration. Our particular contribution stems from the fact that empirical research on the determinants of strategic choice, especially within the upper echelons stream of research, has traditionally depended on demographic and compositional predictor variables, thereby systematically but unintentionally relegating to the background the more important cognitive structures and processes which qualitatively, are fundamental to the determination of strategic choice (S.-C. Chen & Lin, 2018; Hambrick, 2007). Our study fills this empirical gap by examining the effect of transactive memory systems (TMS) on innovation ambidexterity. While to the best of our knowledge, the work of (Q. Chen & Liu, 2018) is the only extant study within the body of the antecedents of ambidexterity literature which first attempted to fill this gap in the literature, their findings based on data collected from EMBA students of a single but prominent university in central China cannot be generalized to all developing countries given the geographic, economic status and economic system differences between China and the rest of the developing world. Our study tackles this dearth of diverse evidence on the cognitive antecedents of innovation ambidexterity by introducing to the body of extant literature empirical evidence from Palestine – a country whose political, economic status, and economic systems are remarkably different from those of China. Besides collecting data from students, we collect more objective data from the current top management team members in the Palestinian banking sector. We find that TMS has a positive and significant effect on innovation ambidexterity, implying that the heterogeneous and multifaceted cognitive resources and structure facilitated by transactive memory systems are intrinsically influential in addressing the knowledge differentiation needs necessary to equip top management teams for specialization along the exploitative and explorative dimensions of innovation ambidexterity. Despite the contextual differences, our findings support those of Chen and Liu (2018), and collectively, they both strengthen the case for distributed cognition as an important sub-lens through which innovation ambidexterity can be approached within the TMT cognition view of ambidexterity literature.

Like the work of Chen and Liu (2018), and unlike the two previous studies preceding it (Dai et al., 2017; Heavey & Simsek, 2014), which investigated the effect TMS has on ambidexterity, this study does not take for granted that TMS will always engender an effective integration of knowledge and information which is what the two studies assumed when they focused solely on examining the direct effect of TMS on ambidexterity. In contrast, while similarly examining the direct effect of TMS on ambidexterity, this study also examines the indirect effect through two confounding mediating variables: shared leadership and behavioral integration. As (Q. Chen & Liu, 2018) argue, confounding variables such as inertia, relational conflicts, and most importantly, the executive contexts in question play a fundamental role in further explaining the information integration processes of TMS. Thus, in this study, we took the line of Chen and Lui (2018) in examining the indirect effect of TMS on ambidexterity through shared leadership. However, we delve further and answer the call for further research into how behavioral integration mediates the TMS-innovation ambidexterity path (Jansen et al., 2009a). Thus, our study provides even more comprehensive support for the role of TMS on ambidexterity by not only demonstrating a direct effect of the primary constructs as well as the indirect effect of shared leadership; it further deepens insight into the black box more extensively than the work of Chen and Lui, (2018) by demonstrating that behavioral integration also has an indirect effect on the TMS-innovation ambidexterity path.

Furthermore, in line with the recent call by scholars for a systematic investigation into how the inherent cognitive conflicts associated with ambidexterity are overcome through a TMT's behavioral processes (Simsek, Veiga, Lubatkin, & Dino, 2005), this study's empirical examination of two of those processes: shared leadership and behavioral integration heeds that call. While extant literature is inundated with studies examining various process variables, their investigations into TMT's behavioral processes have been very limited and insufficient (Q. Chen & Liu, 2018). This study's focus on shared leadership is the second study to do so after Chen and Lui's (2018) paper and, in line with it, sheds more light on the processes which underly the development of integrative routines by top management teams aimed at integrating the diverse distributed cognition of a TMS into knowledge forms that foster the simultaneous pursuit of exploration and exploitation mechanisms for innovation. Shared leadership facilitates collective decision-making by identifying and integrating diverse bodies of contradictory knowledge shared by team members using deliberate or informal frameworks or routines to arrive at consensus decisions to attain ambidexterity. Unlike(Q. Chen & Liu, 2018), this study does not only examine the indirect role of shared leadership, but it also examines the indirect role of deliberate acts directly aimed at behavioral integration among TMTs while using TMS to foster ambidexterity.

Again, this study demonstrates that in addition to the inherent knowledge integration potentialities of shared leadership processes, TMT members also rely on other knowledge integration mechanisms to deliberately integrate the distributed knowledge repositories in transactive memory systems into forms that engender ambidexterity. This study's confirmation of the integrative role of shared leadership as well as its novel insight on the integrative role of behavioral integration, are both significant contributions to the upper echelons literature because while this body of literature has already established that decision making at the top management level is conducted in a focused or distributed fashion, the literature has hitherto remained elusive and inconclusive about identifying the specific leadership behavior that can harness the merits of the distributed cognition of TMTs in an integrative and constructive manner leading to the development of strategic choice (Q. Chen & Liu, 2018; Hambrick, 2007; Heavey & Simsek, 2014). Therefore, by demonstrating a replicated evidential support for the mediating role of TMT shared leadership, we join Chen and Lui (2018) in shedding more light on the black box of how TMT cognition engenders a series of behaviors among team members aimed at harmonizing contradictory information and conflicting strategies. Furthermore, in presenting initial evidence on the mediating role of behavioral integration, we further deepen insights into the black box by showing that in addition to shared leadership, TMTs also employ other knowledge integration means outside of shared leadership as a deliberate and conscious effort towards the integration of the distributed cognition among team members. This implies that TMTs are aware of the advantages of taping into distributed cognition and, more importantly, aware that deliberate integration efforts are necessary, if not crucial, for maximizing the decision-making benefits of such diverse distributed cognition knowledge bases. All in all, this evidence makes substantial extensions and contributions to the upper echelon literature and theory.

Secondly, this study contributes in fundamental ways to the body of literature on individual innovation behavior as the pioneering study to examine the effect of TMT transactive memory systems (TMS) on the individual innovation behavior of top managers – an investigation recommended by (Q. Chen & Liu, 2018) Whereas attempts have been done in extant literature to examine the cognitive antecedents of individual innovation behavior, none to the best of our knowledge have examined how distributed cognition or the differentiation and integration mechanisms of distributed cognition affects the individual innovation behavior of top managers. Thus, this study presents an initial insight into this phenomenon. Its revelation that the effect of TMS on the IIB of top managers is an indirect-only effect that is fully mediated by shared leadership with no mediation effect of behavioral integration brings to fore the significant role shared leadership plays in facilitating the integration of distributed cognition for the enhancement of innovation ambidexterity from a top management team perspective, but also enhances the individual innovation behavior of top management team members as well. This finding lays the foundation which future studies can build upon to understand how distributed cognition affects individual innovation behavior.

Thirdly, this study contributes to the shared leadership literature by supporting the initial exploration of the hitherto unresearched relationship between TMS and shared leadership from a cognition viewpoint. This is because while popular antecedents of shared leadership such as team composition, internal team empowerment, vertical leadership, and task characteristics have been examined in extant literature (Engel Small & Rentsch, 2010; Hoch, 2013; Serban & Roberts, 2016), very little attention has been paid to the cognitive antecedents of shared leadership. In fact, to the best of our knowledge, besides (Q. Chen & Liu, 2018), this study is the second to explore this important predictor and the first to do so from the perspective of an extremely underdeveloped country. Also, since TMT behavioral patterns cannot occur without significant cognitive input (Steevs et al., 2012), it is of utmost importance that the underlying cognitive antecedents to team behavior be explored (Q. Chen & Liu, 2018). In light of this recommendation, this study contributes and extends the behavioral integration literature by exploring, for the first time, the initial evidence on the relationship between TMS and behavioral integration.

Moreover, while considerable strides have been made within the body of extant behavioral integration literature examining various antecedent variables, very few have explored cognitive antecedents. None, to the best of our knowledge, has explored TMS as an antecedent of behavioral integration. Also, the findings of this study provide support for the position of the extant literature on the positive effect of behavioral integration on innovation ambidexterity (Donald C. Hambrick et al., 1996; Jansen et al., 2009a; Lubatkin et al., 2006; Simsek et al., 2005; Venugopal, Krishnan, Upadhyayula, & Kumar, 2020), and most importantly provide support for our initial and novel hypothesis on the direct effect of behavioral integration on the individual innovation behavior of top management team members.

Finally, this study contributes to the TMT involvement literature by examining support for TMT's moderating effect on the behavioral integration and innovation ambidexterity path on one hand and individual innovation behavior on the other. Our findings corroborated those of (Venugopal et al., 2018) while going contrary to those (Mom et al., 2015). It found no support for the moderation effect of TMT involvement on innovation ambidexterity. This finding further strengthens (Venugopal et al., 2018) argument that TMT involvement plays no major role in how behavioral integration might affect ambidexterity in emerging economies, contrary to TMT involvement's observed role the process in developed economies. However, we find for the first time that TMT involvement negatively moderates or dampens the effect of behavioral integration on individual innovation behavior among top management teams.

All in all, this study provides empirical and theoretical support for cognition as an important antecedent of TMT behavioral processes (shared leadership and behavioral integration) in the determination of strategic choices, especially in pursuit of innovation ambidexterity. More specifically, it supports the notion that not only are heterogeneous but complementary domains of knowledge expertise important in developing shared leadership and integrative behavioral mechanisms, but these integrative processes help to maximize the integration and utilization of the knowledge benefits of this distributed cognition in engendering innovation ambidexterity, thus making significant contributions to the team leadership literature.

Practical Implications

This study presents three important sets of managerial implications. First, of all in a bid to engender innovation ambidexterity and individual innovative behavior from a cognitive and, most importantly, a distributed cognition standpoint, firm executives should develop a repository of heterogeneous yet complementary knowledge, which in today's business landscape is difficult to achieve if intentional strategies for developing them are not put in place. This is because the likelihood that a firm would be adept at developing and holding heterogeneous yet complementary knowledge depends on its ability to engender an organizational culture and environment that fosters distributed cognition. However, the success of such environments is dependent on the heterogeneity of TMTs themselves. Therefore, the difficulty stems from the fact that most TMTs are highly homogenous from a knowledge domain standpoint (Q. Chen & Liu, 2018; Hambrick, 2007; Smith, Binns, & Tushman, 2010). Thus, from a practical perspective, this study joins (Q. Chen & Liu, 2018) in recommending developing such a distributed cognition engendering environment by redesigning the TMT selection process to incorporate sensitivity to diversity in knowledge and expertise. In other words, firms should prioritize hiring TMT members who each have domain-specific experiential and generational knowledge in key functional areas that differ one from the another. However, irrespective of the need for each TMT member to have different domain expertise, they should also have some rudimentary knowledge of other domains for which they have no expert knowledge.

Secondly, once mechanisms have been put in place to develop and hold distributed cognition, a concerted effort should be put into facilitating its integration by developing shared leadership and other mechanisms that engender knowledge integration. This is important because traditional conflicts among executives, high turnover rates, and the dynamism of knowledge at the executive level impede the maximization of the benefits of distributed cognition (Q. Chen & Liu, 2018; Heavey et al., 2015). Thus, we recommend that TMT can reap the benefits of shared leadership in facilitating the effects of TMS on both innovation ambidexterity and individual innovation behavior by integrating TMS based distributed cognition cost-effectively through the distribution of leadership responsibilities to different TMT members but encourage them to make collective decisions for each of those responsibilities. Furthermore, having provided initial empirical evidence linking TMS and behavioral integration as well as behavioral integration and both innovation ambidexterity and individual innovation behavior, this study recommends that the development of other deliberate behavioral integration processes and mechanisms as recommended by Hambrick (1994, 1995, 1998) other than shared leadership be implemented to create a conscious awareness of and place obvious importance on the need to integrate diverse but complementary knowledge during decision making for innovation ambidexterity.

Thirdly, while active TMT involvement may not influence behavioral integration on innovation ambidexterity, it does engender its effect on individual innovation work behavior. Thus, firms intending to maximize individual innovative work behavior should encourage the harnessing and integration of heterogeneous yet complementary knowledge and encourage higher TMT involvement at different levels of the organization.

Limitations and future research

As with most research, our study is not devoid of limitations. First of all, attention must be taken to generalize our findings. It was conducted in Palestine, a nation with unique sets of constraints and opportunities due to the decades-long blockade and political conflict. Moreover, generalizing to similar nations under various forms of occupation is also not recommended because the constraining or engendering peculiarities of the management environment in Palestine is not a replica of the peculiarities of these other nations. Secondly, as pioneering research in the middle eastern region, the findings of this study serve as the foundation upon which more investigations can be carried out to open the black box of the TMS-innovation ambidexterity path on the one hand and the TMS-individual innovation behavior path on the other, can be examined within the region thereby taking care of the scope limitation of the current study in generalizing to the region. Thirdly, this study took evidence from the banking study alone, further limiting the sectoral scope of the study. Future researchers should provide comparative evidence from the manufacturing sector to further examine the universality of the findings reported in this study. Finally, while our study focused on examining internal top management team influencers of the TMS-IA and TMS-IIB paths, such as TMT shared leadership and TMT behavioral integration, future studies should also examine external influencers of these paths such as market and investor originating factors.

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