ABSTRACT

Title of dissertation: A MULTILEVEL INVESTIGATION OF LEADER EMPOWERING BEHAVIORS: INTEGRATING THE JOB DEMANDS-CONTROL MODEL AND TRANSACTIVE MEMORY SYSTEM THEORY

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Doctor of Philosophy, 2013

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Empowering leader behaviors have been generally suggested to motivate employees and facilitate their goal achievement, but they can also be challenging and demanding. Yet questions regarding why employees may feel challenged and even concerned when empowered and how leaders can reduce such unfavorable reactions have been largely ignored in the literature. To examine the multifaceted impacts of empowering leadership and, at the same time, consider how the empowerment climate created by the leader at the team level may help facilitate the individual-level leadership processes, this research integrates the job demands-control (JD-C) model and the transactive memory system (TMS) literature to advance and test a model of the impacts of leader empowering behaviors on individuals and teams, as well as interrelationships of the multilevel dynamics. Applying the JD-C model, I propose that empowering leadership can provide team members with learning opportunities but also generate perceptions of role overload, which then influence, in opposite directions, their engagement and performance. Further incorporating the TMS literature, I propose that by creating an empowerment climate, leaders can help foster the development of TMS within the team. TMS will, in turn, benefit team performance as well as produce a positive cross-level influence on individual team members. Using survey data from 74 research and development teams in 14 high-technology companies in China, hierarchical linear modeling and hierarchical regression analyses provided overall support for the model. Theoretical and practical implications are also discussed in this dissertation.

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BEHAVIORS: INTEGRATING THE JOB DEMANDS-CONTROL MODEL
AND TRANSACTIVE MEMORY SYSTEM THEORY

by

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Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2013

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ACKNOWLEDGEMENTS

The writing of this dissertation proposal has been the most significant academic experience in my pursue of the Ph.D. degree. Without the support, patience and guidance of the following people, this work would not have been completed. It is to them that I owe my deepest gratitude.

Professor Kathryn M. Bartol undertook to act as my supervisor despite her many other academic and professional commitments. I have been working with Kay since I entered the program, and I have had such a wonderful experience. She has set an excellent role model for me by constantly demonstrating enthusiasm in research and rigorous attitudes toward work. More important, she has unselfishly devoted her passion and personal effort in developing and supporting me.

I am grateful to Professor Henry Sims, who has been one of my best friends since I came to the United States. He had been shown concerns and support to me like father. His wisdom, knowledge, and commitment to the highest standards inspired and motivated me and his kindness and personal concern made me deeply touched.

My thanks must go also to Professor Zhi-Xue Zhang, my previous advisor in Peking University, China. It is him who introduced and encouraged me to the academia and helped me see the beauty of academic research. In the past years, Professor Zhang has constantly provided all kinds of support to my research. He made me understand the true essence of "Once a teacher, always a teacher."

The members of my dissertation committee, Professors Paul Hanges and Professor Subrahmaniam Tangirala, as well as my colleagues in the Robert H. Smith School of Business, Professors Robert Baum, Gilad Chen, Hui Liao, Debra Shapiro, Susan Taylor, and Paul Tesluk, have generously given their time and expertise to better my work and develop me. I thank them for their contribution and their good-natured support.

Liang Xiao, my husband, Jiangying Liu, my mother, Xianmin Dong, my father, and Jianmin Dong, my uncle, without whom I cannot survive the challenging life in the United States. Their love, support and patience have also taught me so much about sacrifice, discipline and compromise.

I must acknowledge as well the many friends and colleagues who assisted, advised, and supported my life and research over the years. Especially, I need to express my gratitude and deep appreciation to Crystal Farh, Jiseon Shin, Lei Zhang, Xiaomeng Zhang, Tingting Fan, Chao Liu, Song Gao, Wenjie Li, Taotao Liu, Feng Zhao, Qiangru Yang, Qing Ying, Wei Guo, Qiang Li, and Zhe Chen whose friendship, hospitality, and knowledge have supported, enlightened, and entertained me over the many years of our friendship. They have consistently helped me keep perspective on what is important in life and shown me how to deal with reality.

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CHAPTER 1: INTRODUCTION

With the trend toward providing employees increased authority and responsibility for their work (e.g., Ahearne, Mathieu, & Rapp, 2005; Conger & Kanungo, 1988), leader empowering behaviors have assumed special importance in management research and received increased attention. As Kanter (1989) states in her book, *When giants learn to dance*, organizations need to liberate their employees from stultifying hierarchies if they are going to be able to "dance" in the flexible, fast-changing future, indicating the importance of leader empowering behaviors in ensuring that employees contribute effectively to crucial organizational functions such as performance and adaptation. Scholarly research has also provided some support for the favorable outcomes of leader empowering behaviors including individual and team/unit level creativity and performance (e.g., Ahearne et al., 2005; Chen, Sharma, Edinger, Shapiro, & Farh, 2011; Lorinkova, Pearsall, & Sims, 2013; Martin, Liao, & Campbell-Bush, in press; Srivastava, Bartol, & Locke, 2006; Yun, Faraj, & Sims, 2005; Zhang & Bartol, 2010).

While most related research has focused on the beneficial aspects of empowering leadership, scholars have begun to recognize the possible undesirable impacts empowering leaders may have on their followers. For example, some have noticed employees' adverse reactions toward empowerment such as resistance and absenteeism (Cordery, Mueller, & Smith, 1991; Kirkman & Shapiro, 2001; Maynard, Mathieu, Marsh, & Ruddy, 2007). Moreover, Ogden, Glaister, and Marginson reported that empowered employees expressed reservation toward empowerment because of "the additional demands empowerment placed on them" (2006: 530) and they were even "anxious about empowerment and the demands it entailed" (2006: 550). However, prior research has not explicitly and theoretically examined the potential costs emanating from leader empowering behaviors. As a result, we lack understanding about how

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leaders may be able to leverage the positive aspects while also assuaging potentially negative influences of their empowering behaviors on individual employees.

Coupled with the concern for impact on individual employees, there is growing recognition that the widespread use of team-based structures in today's organizations requires managers to lead not only individuals but also teams (Chen, Kirkman, Kanfer, Allen, & Rosen, 2007). While empirical evidence shows that empowering a team effectively develops and maintains high team performance (e.g., Lorinkova et al., 2013; Srivastava et al., 2006; Yun et al., 2005), little research has included leader empowering behaviors at both individual and team levels in one investigation. I suggest that a multilevel perspective can offer valuable insights regarding how empowering leaders may facilitate teamwork, which then provides useful team resources for members to reap the benefits as well as control the costs associated with empowerment. Specifically, although empowering an individual may lead to increased demands for the person, empowering a team can influence how demands and responsibilities are distributed within the team (cf. Pearsall, Ellis, & Bell, 2010). Members of an empowered team rely on each other for information and knowledge to collectively make decisions (e.g., Srivastava et al., 2006). Consequently, the mutual reliance and knowledge exchange free team member to develop deeper expertise in specialty areas, while ensuring access to one another's task-relevant information (Lewis, 2003; Pearsall et al., 2010). Such an emergent state of knowledge specialization and sharing is conceptualized as transactive memory system (TMS), referring to team members' shared understanding of the cooperative division of labor for learning, remembering, and communicating relevant team knowledge (Lewis, 2003). Given that effective team knowledge management brings advantages to both individuals and the team, TMS

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should help explain how team performance may benefit from team-level empowerment while minimizing individual costs.

Accordingly, the goal of this study is to advance and test a model of the impacts of leader empowering behaviors on individuals and their teams, as well as interrelationships of the multilevel dynamics. For the purpose of this paper, I use *empowering leadership* to refer to leader empowering behaviors toward individual team members, and *empowerment climate* to represent team members' shared perception of leader empowering behaviors toward the team. In developing the theoretical model, I integrate the job demands-control (JD-C) model (Karasek, 1979; Karasek & Theorell, 1990) and the transactive memory system (TMS) literature (e.g., Austin, 2003; Lewis & Herndon, 2011; Wegner, 1987). The JD-C model provides theoretical basis to reveal both positive and negative outcomes of empowering leadership and TMS theory helps identify TMS as a paramount team resource carrying significant implications for empowered teams and team members.

I seek to make several contributions to existing literatures. First, although scholars have noticed that empowered individuals routinely face additional challenges that may hamper their ability to perform (Humborstad & Kuvaas, 2013; Ogden et al., 2006), surprisingly little research has directly explored this possibility. This study is among the first to offer a balance to the often investigated desirable outcomes of empowering leadership and the often ignored individual costs associated with it. Second, I identify transactive memory system as a mediating mechanism linking empowerment climate and team performance, and also highlight its importance in facilitating the individual-level empowerment process. It addresses a paradox by suggesting that while empowering individuals may lead to their experience of role overload, when all team members are empowered, it eventually leads to the development of a transactive memory system

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which helps each individual handle the role overload and enhances the overall team effectiveness. Third, the study adds to the growing literature on TMS. Scholars have directed increased attention toward understanding antecedents of TMS development (e.g., Brandon & Hollingshead, 2004; Zhang, Hempel, Han, & Tjosvold, 2007). This study indicates that empowering leaders can play a key role in developing a team transactive memory system among its members.

CHAPTER 2: THEORETICAL BACKGROUND AND

HYPOTHESES DEVELOPMENT

In this chapter, I develop the theoretical model by first drawing from the JD-C model to explicate how empowering leadership will simultaneously increase individual team member's perceived role overload and learning opportunities, which will be differentially associated with employee engagement and subsequent performance. As such, I point out perceived role overload and learning opportunities as mediating mechanisms of the relationship between empowering leadership and engagement. Next, I integrate transactive memory system theory to hypothesize that empowerment climate helps develop TMS in the team, which further moderates the two mediated relationships at the individual level. Finally, I propose a positive relationship between TMS and team performance. The Hypothesized Model is depicted in Figure 1.

Empowering Leadership as a Double-Edged Sword – A Job Demands-Control View

Yukl (2002) treats leadership as an influence process that consists of patterns of behavior that influence other entities such as individuals and teams. Among the diverse leader behaviors that have been studied (Pearce, Sims, Cox, Ball, Schell, Smith, & Trevino, 2003), empowering leadership has attracted much attention recently. Researchers have approached the notion of empowering leadership from a variety of theoretical perspectives (Leach, Wall, Jackson, 2003; Menon, 2001). One approach treats empowering leadership as a set of leader practices that delegate responsibility to give employees decision-making authority (Burke, 1986; House, 1988; Kanter, 1983). Another motivational approach views power (or perceived control) as an individual's intrinsic need for self-determination (Deci, 1975) and personal mastery (Bandura, 1986) and accordingly, conceptualizes empowering leadership and empowerment as an enabling process (Conger & Kanungo, 1988; Spreitzer, 1995; Thomas & Velthouse, 1990). This

FIGURE 1
Hypothesized Model
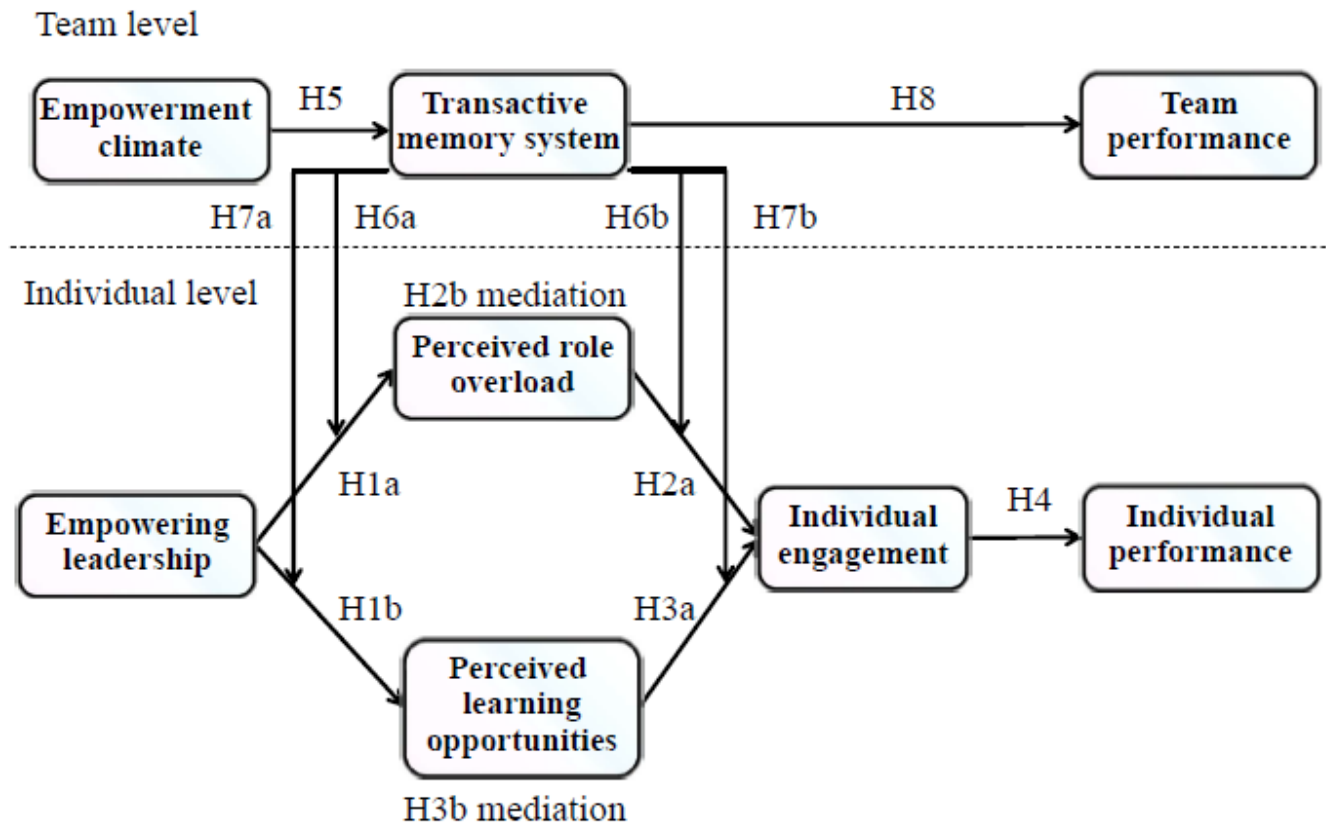
conceptualization is rooted in a variety of cognitive motivational theories, including self-determination theory (Deci, 1975), job design theory (Hackman & Oldham, 1980), and social cognition theory (Bandura, 1977, 1986). Based on these theories, to empower is to enable or to energize an individual with the belief that he or she can adequately cope with the situation—the behaviors "could have an impact" and he or she "could perform the relevant behavior competently" (Thomas & Velthouse, 1990: 672).

Accordingly, I define empowering leadership as the process of implementing conditions that enable sharing power with employees by highlighting the significance of employees' jobs, involving them in decision making, expressing confidence in their capabilities, and removing bureaucracy constrains to allow more autonomy and control (Ahearne et al., 2005; Zhang & Bartol, 2010). The identification of these dimensions of empowering leadership is based on the notion that managerial strategy or action strengthening the need for impact and self-efficacy belief of employees will make them feel more powerful (Conger & Kanungo, 1988). These empowering behaviors are conceptualized as having additive motivation effects and collectively reflect the enabling process of empowerment (Conger & Kanungo, 1988). In Spreitzer's (1995: 1444) words, "the lack of any single dimension will deflate, though not completely eliminate, the overall degree of … empowerment." Under this definition, empowering behaviors are related to but differ from delegation because the latter is only one aspect of empowering behaviors (Martin et al., in press; Mills & Ungson, 2003).

Inherent in the conceptualization of empowering leadership is the notion that it encourages followers to take greater responsibility and control over their own tasks (Chen et al., 2010). While it is well acknowledged that by doing so, an empowering leader can prompt individual development and growth, it has often been ignored that empowering leader can also

generate more role demands for employees as he or she involves followers in decision making for the sake of the collective, encourages them to take full responsibility for the consequences of their work, and expresses prospects for higher performance. Therefore, an integrative theory is needed to reveal how empowering leaders may enhance followers' learning aspiration while also taking into consideration the demanding effect of empowering leadership. Such an inquiry should offer supervisors with insights on how to effectively leverage the positive aspects while minimizing potentially negative influences of empowering behaviors on individual employees.

In developing the theoretical model, I first draw on the job demands-control (JD-C) model (Karasek, 1979; Karasek & Theorell, 1990) to identify both positive and negative outcomes of empowering leadership toward individual team members. The JD-C model contends that the demands of the work situation and the amount of control employees have to cope with these demands are related to both stress- and learning-related outcomes (Karasek & Theorell, 1990). Applying the JD-C model to empowering leadership, I argue that empowering leadership presents greater job demands and challenges to followers, such as additional responsibilities and high expectations (Ogden et al., 2006), yet it also grants individuals more control over aspects of tasks which offers them opportunities to deal with the challenges and learn from the experience (Parker & Sprigg, 1999; Taris & Feij, 2004). Accordingly, I propose empowering leadership to have the potential to simultaneously increase individual perceived role overload and learning opportunities at work.

Role overload is an individual's perception that the work demands he or she receives surpass, quantitatively or qualitatively, the resources this person possesses (Peterson, Smith, Akande et al., 1995). Therefore, it reflects individuals' perceptions of distraction and stress when they feel they have inadequate resources to deal with role demands (Brown, Jones, & Leigh,

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2005; Kahn, Wolfe, Quinn, & Snoek, 1964). Because leaders are one of the most important agents for role definition, it is plausible to expect that they exert a critical influence on employee role overload (Kelloway, Sivanathan, Francis, & Barling, 2004; Peterson et al., 1995; Tordera, González-Romá, & Peiró, 2008). Specifically, there are several reasons to expect empowering leadership to be positively related to individual team member's perceived role overload.

First of all, through empowering, team leaders may increase the total number of role demands related to the job a team member undertakes. Unlike employees with more directive leaders who actively structure subordinates' work through providing clear directions, external monitoring, and feedback on their performance (e.g., House, 1983; Pearce et al., 2003), empowered team members are expected to make their own decisions on how to carry out the tasks, monitor their own work and constantly take necessary actions to avoid mistakes. Studies have shown that employees show concerns about empowerment for the potentially overwhelming obligations associated with their tasks (Kirkman & Shapiro, 1997; Ogden et al., 2006). Furthermore, because empowering leaders have confidence in employee initiatives and encourage them to solve problems on their own, leaders may turn their attention to other issues (Tordera et al., 2008) and hence provide less direct guidance and supervision. Empowered employees need to face more uncertainty in their job, which requires them to stretch their attention, effort, and resources to figure out their own role and availability of role resources (Christina & Bjork, 1991; Goodman & Wood, 2004). Hence, it may be more difficulty for them to effectively prioritize workloads and expend effort efficiently, leading to experienced role overload.

Second, empowering leaders convey prospects for high performance (Zhang & Bartol, 2010) and show confidence and trust toward employees. As a result, employees may feel the

pressure to be "good soldiers" and the obligation to take charge by accepting additional responsibilities and meeting higher expectation. For instance, in addition to completing their own tasks, empowered employees are also expected to engage in broader decision-making, problem-solving, and improvement related activities in their team (e.g., Chen et al., 2010; Fuller, Marler, & Hester, 2006). There is evidence showing that when an employee feels empowered by the leader, he or she tends to demonstrate more extra-role behavior, such as providing suggestions or taking actions to facilitate organizational change, going above and beyond the "call of duty" to provide service to customers, and generating creative ideas to improve the current organizational procedure and process (Alge, Ballinger, Tangirala, & Oakley, 2006; Choi, 2007; Raub & Robert, 2010). All of these are considered to be additional responsibilities that are not part of employees' job requirements. Whereas any one of these expectations might be reasonable by itself, collectively, they may require more than the individual's available resources to satisfy (Kahn et al., 1964), therefore leading to perceived role overload. Consistent with this notion, Harris and Kacmar (2006) found that employees who had a good relationship with and were trusted by the leader were often expected to perform tasks beyond the scope of the formal job description, which then led to higher level of perceived stress (Harris & Kacmar, 2006). Taken together, I hypothesize:

H1a: Empowering leadership is positively related to individual perceived role overload.

While empowering leadership may potentially increase individual team members' role overload, the JD-C model suggests that when a working context simultaneously contains high levels of job demands and grants employees more control over tasks such as timing and methods (as what an empowering leader can provide to the followers), it can create the opportunity for gaining new knowledge and skills (Parker & Sprigg, 1999; Taris & Feij, 2004). Accordingly, I

identify individual perceived learning opportunities as a particularly relevant element that may be driven by empowering leadership. Following Holman and Wall (2002) and Morrison, Cordery, Girardi, and Payne's (2005) conceptualization, I define perceived learning opportunities as the extent to which an employee perceives his or her workplace as requiring the use of existing knowledge and skills as well as offering opportunities to develop new skills. Different from actual learning behaviors or the consequences of obtaining knowledge, perceived learning opportunities reflects an individual's psychological state or belief that the leader is providing chances for skill utilization, job enhancement, and professional growth (Proost, van Ruysseveldt, & van Dijke, 2012). The psychological nature of this construct and its close relationship with knowledge and skill acquisition (van Ruysseveldt & Taverniers, 2010) makes it an appropriate proximal learning-related outcome of empowering leadership.

According to the JD-C model, increased work demands are presumed to offer challenging goals that increase both needs and possibilities for learning, and the high level of autonomy at work enables employees to experiment with different ways of dealing with these demands, stimulating learning-related motivation and behaviors (Karasek & Theorell, 1990; Parker & Sprigg, 1999; Taris & Feij, 2004). Applying this logic to the situation of empowering leadership, empowering leaders provide new challenges to team members to manage their own tasks and expose the followers to more important and complex problems with greater uncertainty. They also provide more opportunities for the team members to think, to use the full range of expertise, and to develop new skills to perform these practices (Lorinkova et al., 2013; Morrison et al., 2007). Meanwhile, the increased autonomy and control offered by the leader allow team members to try different ways to perform their tasks, serving as opportunities for "learning by doing." Finally, empowering leaders communicate high expectations for excellence and superior

performance. Evidence has suggested that these behaviors can stimulate followers' needs for growth (Bass & Avolio, 1994; House & Shamir, 1993; Wang & Howell, 2010) and highlight the need to obtain critical new skills to meet expectations. Therefore, empowering leaders should motivate employees to form a positive attitude toward learning. Employees are likely to perceive and actively seek potential learning opportunities in the work. By contrast, a less empowering or more directive leader makes most of the decisions by him- or her- self, gives orders to team members, and closely monitors team members' behaviors. The leader does not expect team members to utilize their unique skills, neither does he or she motivate team members to develop their professional expertise, thus limiting the opportunities to increase team members' skills.

Supporting these ideas, Yun et al. (2005) found that an empowering leader provided more learning opportunities to members in a trauma resuscitation teams. Consistently, Lorinkova et al. (2013) found that empowering leadership promoted learning of new behaviors and skills in a leadership development computer simulation. In addition, the literature of on-the-job learning suggests that challenging job assignments, a combination of complex and difficult tasks and increased power to handle the challenges, expose employees to novel situations that require learning new or updating existing routines (McCauley, Ruderman, Ohlott, & Morrow, 1994). Finally, Vroom and Jago (1988) suggested that participative leadership, including consultation and joint decision making, was suitable for achieving subordinate development. Therefore, I hypothesize:

H1b: Empowering leadership is positively related to individual perceived learning opportunities.

Perceived Role Overload and Learning Opportunities as Mediators of the Empowering Leadership-Engagement Relationship

I further propose that perceived role overload and learning opportunities will mediate the relationship between empowering leadership and team member engagement, in opposite directions. There is increased interest in engagement given claims from consultancies and scientific research that having engaged employees results in positive job attitudes and performance and eventually, higher organizational profitability and shareholder return (e.g., Harter, Schmidt, & Hayes, 2002; Rich, LePine, & Crawford, 2010; Salanova, Agut, & Peiró, 2005). According to Maslach and Leiter (1997), and Maslach, Schaufeli, and Leiter (2001), individual engagement refers to a positive work state in which employees are dedicated to excellent performance and confident in their effectiveness. It is characterized by energy toward one's job, involvement or attachment to work, and perceived personal accomplishment or efficacy (Cole, Walter, Bedeian & O'Boyle, 2012), and these three dimensions collectively represent a higher-order construct of engagement (Christian, Garza, & Slaughter, 2011).

Empowering leadership should have a significant impact on employee engagement because empowering leaders encourage employees' participation in important work-related activities that less empowered employee may not have authority, autonomy, and motivation to involve (Chen & Tesluk, 2012). However, there is a lack of substantive evidence showing the positive relationship between empowering leadership and employee engagement. More importantly, empowering leaders offer employees greater control while also increasing role overload, and these two aspects should impact individual engagement differently. Thus, empowering leadership may have a more complex impact on team member engagement than it appears to be the case. I argue that role overload and perceived learning opportunities serve as functionally opposite mediating mechanisms of the relationship between empowering leadership and team member engagement.

Role overload resulting from empowering leadership can reduce team member engagement because it is associated with involuntary physiological responses (e.g., fatigue and high blood pressure), uses up energy and time, and thus directs away team members' attention from their role performance. As a result of the lack of necessary personal resources, role overload may also reduce followers' confidence in effectively performing job functions and handling task-related problems (Gilboa, Shirom, & Coper, 2008), leading to a tendency to withdraw rather than engage in the work. Moreover, Kahn (1990) suggested that when working under overloaded requirements, employees tend to perform tasks as if guided by external scripts, rather than self-invest in their work. Therefore, team members may view their job as less interesting and less motivating, reducing the likelihood of active engagement. Finally, team members who are more overloaded are likely to feel frustrated and anxious, which is associated with an overall unpleasant and dissatisfying work experience (Marrone, Tesluk, & Carson, 2007) which can harm their effective involvement in various task-related activities. Supporting this argument, Humphrey, Nahrgan, and Morgeson (2007) found in their meta-analyses that as job demands increase, workers will become physically and psychologically uncomfortable, leading to more negative experiences while at work and reduced engagement. Thus, I propose:

H2a: Role overload is negatively related to individual engagement.

So far, I have hypothesized that empowering leadership can increase team members' perception of role overload, which, in turn, decreases the extent to which they involve in task-related activities and invest personal resources to complete tasks. That is, team members, when empowered by their team leader, tend to reduce engagement due to increased perceived role overload. These arguments together lead the following prediction:

H2b: Role overload mediates the relationship between empowering leadership and individual engagement.

Learning opportunities provided by empowering leaders, on the other hand, may serve as critical resources and important means for skill utilization, job enhancement, and professional growth for team members (Proost et al., 2012). Employees who have the necessary resources to complete their tasks are more apt to invest energy and efforts in their work roles (Bakker, van Emmerik, & Euwema, 2006; Salanova et al., 2005). Such opportunities are motivating because according to the job characteristic theory (Hackman & Oldham, 1976), jobs that offer opportunities to use and obtain a variety of skills are positively related to individuals' experienced meaningfulness of work, which motivates them to extend greater effort to pursue high level of job performance. Further, the associated knowledge acquisition makes team members feel ready and prepares them to devote their physical, cognitive, and emotional energies into role performance (Rich et al., 2010). Finally, having opportunities to enlarge one's knowledge pool and enhance one's capabilities implies greater prospects for future benefits, such as personal growth or achievements. Therefore, team members tend to view the learning opportunities offered by their empowering leader as meaningful and desirable (Ohlott, 2004; Rodell & Judge, 2009; Schmidt, Hunter, & Outerbridge, 1986). As a result, they are more willing to invest personal resources into the work. Supporting this idea, work on the developmental experience has suggested that taking developmental jobs that contains opportunities for acquiring new knowledge and skills are positively related to individuals' motivation to learn and negatively related to their withdrawal and disengaging behaviors at work (Podskoff, LePine, & LePine, 2007).

H3a: Perceived learning opportunities are positively related to individual engagement.

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Taken together, I have hypothesized that empowering leadership can create more learning opportunities as perceived by team members, which, in turn, motivate them to actively engage in their role performance. That is, empowering leadership can indirectly impact team member engagement through shaping their learning-related perception and motivation. I propose:

H3b: Perceived learning opportunities mediate the relationship between empowering leadership and individual engagement.

Individual Engagement and Task Performance

I expect team member engagement to have a positive influence on task performance. Task performance, sometimes referred to as in-role performance, reflects how well an individual performs the duties required by the job (Borman & Motowidlo, 1997). At a general level, as a positive work state of feeling responsible for and committed to superior job performance (Britt, 1999, 2003; Maslach et al., 2001), engagement has been suggested to relate to the persistence and intensity with which individuals pursue their task performance (Christian et al., 2011; Rich et al., 2010). Specifically, highly engaged employees are more likely to invest their individual energies into the work roles and feel more attached to their work. Therefore, they tend to work with increased levels of effort on their tasks for longer periods of time and they can be more concentrated on their own responsibilities (Rich et al., 2010). Such endeavors toward role accomplishment should result in a greater likelihood of meeting job expectations and achieving role-related goals at work (e.g., Ashforth & Humphrey, 1995; Kahn, 1990). In addition, the perception of personal accomplishment or efficacy motivates individuals to increase efforts to complete tasks, with greater persistence and resilience in the face of performance obstacles. In contrast, employees who are less engaged in their work withhold their energies and resources (Kahn, 1990). This is reflected in task activity that is "robotic, passive, and detached" (Christian

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et al, 2011: 619), thereby preventing individuals from achieving higher levels of task performance. In a recent meta-analyses based on over 4,000 samples, Christian et al. (2011) found that engagement was positively related to task performance (the corrected mean correlation was .43). Hence, I hypothesize:

H4: Individual engagement is positively related to performance.

Empowerment Climate and Transactive Memory System

Given the increased use of work teams in today's organizations and the important role of leader empowering behaviors on team processes and outcomes (e.g., Chen et al., 2010; Lorinkova et al., 2013; Srivastava et al., 2006), I extend the theoretical model to the team level by investigating the implications of empowerment climate on both team and individual members. Empowerment climate refers to team members' shared perception of their leader's empowering behaviors, which include raising the level of autonomy and responsibility of the team, encouraging collaborative decision making, promoting self-management of teamwork, supporting information sharing and exchange, and conveying confidence in the team's capabilities to handle challenging work (Arnold, Arad, Rhoades, & Drasgow, 2000; Chen et al., 2007; Chen et al., 2010; Kirkman & Rosen, 1999). The conceptualization of empowerment climate is consistent with existing literature which states that empowerment retains the same meaning across levels (Chen, Bliese, & Mathieu, 2005; Kirkman & Rosen, 1999; Spreitzer, 1996).

Empowerment climate tends to create psychological ownership of team tasks, higher levels of cooperation, and collective information processing (e.g., Cohen, Chang, & Ledford, 1997; Srivastava et al., 2006; Zaccaro, Rittman, & Marks, 2001). Through these influence processes, empowerment climate can shape how role demands and expertise responsibilities are

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distributed within the team. I use transactive memory system to represent members'

understanding of the distribution of the role and expertise responsibility. TMS is defined as team

members' shared understanding of the cooperative division of labor for learning, storing,

communicating, and collectively using relevant team information (Hollingshead, 2001; Lewis,

2003; Lewis, Lange, & Gillis, 2005; Wegner, 1987). TMS is also frequently characterized as "a

shared understanding of who knows what" (Lewis & Herndon, 2011: 1255). Inherent in this

definition is the notion of differentiation in team members' knowledge as well as team members

sharing and coordinating to use the knowledge available in the team. In other words, a team with

a high level of TMS can efficiently divide responsibility of information among team members

and team members are able to access one another's expertise (Pearsall et al., 2010).

Empowerment climate may influence the development of transactive memory system in a

team for two reasons. First, empowering leaders encourage team self-management and collective

decision making, creating increased needs and opportunities for cooperation and interaction

among team members (Lorinkova et al., 2013; Raub & Robert, 2010). For instance, Srivastava et

al. (2006) suggested that empowering leaders motivated a greater collaborative attempt to help

one another and they reported a positive relationship between team-level empowering leadership

and knowledge sharing within the team. It has also been suggested that a lack of explicit

direction from the team leader will lead to a higher level of members' involvement in decision-

making, facilitating closer relationship among its members. As empowered team members

actively engage in exchanges regarding the nature and scope of each member's expertise, roles,

and duties, they begin to develop a clear picture of each other's unique expertise and

informational responsibility (Lewis, 2003; Pearsall et al., 2010). Consistently, Austin (2003) has

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shown that team members make better use of each other's expertise when the team is responsible for their own decisions.

Second, empowering leaders express confidence in the team's capability to handle challenging tasks and enhance collective efficacy. With an increased sense of impact and mastery, team members' are motivated to put their efforts together to perform. Supporting this idea, research has suggested that there is a likely connection between empowerment (or in some studies, personal control) and a variety of participation behaviors, such as giving suggestions and sharing knowledge (e.g., Kirkman & Rosen, 1999; Srivastava et al., 2006; Tangirala & Ramanujam, 2008). In this way, all team members are likely to keep informed about and maintain access to others' task-relevant information (Zhang et al., 2007), and the team as a whole will be better able to organize and utilize available knowledge. Together, these arguments suggest that in a team with a strong empowerment climate, TMS is likely to emerge. I propose:

H5: Empowerment climate is positively related to TMS.

Cross-Level Moderating Effects of TMS

In the recent development of the JD-C model, Karasek and Theorell (1990) posited that team members should be able to use the additional resources in their team to actively cope with job challenges, protecting them from strain, and facilitating positive outcomes such as learning and mastery. Accordingly, given that TMS can shape and clarify team members' roles for information (Brandon & Hollingshead, 2004) and allows each member to have access to other's expertise (Richter, Hirst, van Knippenberg, & Baer, 2012), it should have important critical implications for individual members' role overload and learning opportunities that are associated with empowering leadership. This study identifies TMS as a valuable team resource that helps translate the impact of empowerment climate on individual-level empowerment process.

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Specifically, I propose that TMS facilitates the effectiveness of empowering leadership by weakening its negative impact through role overload and boosting its positive impact through learning opportunities.

As I have stated earlier, empowering leadership may be related to individual members' perceived role overload because of increased role demands and expectations. TMS serves as an important informational resource through which a team member's cognitive burdens can be efficiently and reasonably shared by other team members based on their expertise. Specifically, the basic idea of TMS is that, the team develops a structure for assigning responsibility for information (i.e., divide the cognitive labor) based on one another's specialty (i.e., coordinate knowledge) (Brandon & Hollingshead, 2004; Lewis & Herndon, 2011). As a result, knowledge and role demands become more differentiated among members. When individual team members are empowered and are obligated to take on additional roles, a well-developed TMS allows them to assume the responsibilities within their own area of expertise. Because handling familiar tasks with needed skills requires much less energy and resources than dealing with a variety of tasks, this role demands allocation (as reflected in TMS) reduces each member's role requirements (Wegner, 1987; Wegner, Giuliano, & Hertel, 1985). Additionally, collective knowledge that can be used by team members also increases as a result of TMS development. Consequently, the extra information in the team will enable individual members to more effectively handle the role demands placed by empowering leaders, leading to lessened cognitive burden and perceived role overload.

The negative effect of role overload on employee engagement may also become weaker when there is a high level of transactive memory system. Transactive memory system helps team members quickly locate the specialized expertise possessed by different members. This enables

team members to better handle their role overload by efficiently and effectively getting what they need from the right person (Richter et al., 2012), and hence, engagement is less likely to reduce. Schaubroeck, Jones, and Xie (2001) have pointed out that individuals who have the resources to solve difficulties tend to suffer fewer physiological consequences (such as disengagement) after they are exposed to stressors. Consistently, Richter et al. (2012) suggested that shared "knowledge of who knows what" was a useful team informational resource (Stasser, Vaughan, & Stewart, 2000; van Ginkel & van Knippenberg, 2009) that enables team members to effectively direct their search activities toward those others "who are most likely to harbor the information and expertise relevant to the problem at hand" (Richter et al., 2012: 1284). Based on these arguments, I hypothesize that TMS not only potentially reduces empowered team member's role overload but also provides additional resources for them to more actively cope with the role overload, thereby attenuating the negative impact of role overload on engagement. I propose:

> *H6: TMS moderates the mediated relationship between empowering leadership and individual engagement through perceived role overload by weakening a) the empowering leadership-role overload relationship and b) the role overload-engagement relationship.*

As an important informational support and resource at the team level, TMS also facilitates the positive impacts of empowering leadership on team member engagement through perceived learning opportunities. First, it may strengthen the positive relationship between empowering leadership and individual perceived learning opportunities. In a team with high levels of TMS, team members possess specialized information that is useful for completing tasks at hand, and the TMS provides essential "meta-knowledge" that enables team members to effectively share their knowledge (Choi, Lee, Yoo, 2012). Therefore, while empowered team members have increased autonomy to acquire new skills, TMS assures that there is a great

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amount of knowledge in the team for each individual team member to learn. Consistently, Brandon and Hollingshead (2004: 633) have pointed out that TMS makes "a larger pool of information available to each member than could be managed by any one person alone". Team members have the freedom and choice to access and use the available information in the team to experiment and to solve problems, leading to perception of greater learning opportunities. These resources are particularly critical for empowered team members because they are expected to explore and process information on their own.

In addition, the sharing and collaborative use of the knowledge from each team members may convey the importance of contributing to the collective pool of information as well as learning from each other. In this sense, TMS helps team members develop a more positive and active attitude toward learning. As they find their job provides such valuable and rewarding learning opportunities, they will likely be motivated to allocate more of the effort to their work (e.g., LePine, LePine, & Jackson, 2004). Taken together, TMS can strengthen the positive relationship between empowering leadership and individual engagement through perceived learning opportunities. In line with this view, the recent development of the JD-C model has included social support (TMS as a cognitive support) as a critical contextual facilitator that may boost the impact of demanding yet autonomous working situations (e.g., empowering leadership) on learning and subsequent job attitudes and outcomes (Daniels, Boocock, Glover, Hartley, & Holland, 2009; Karasek & Theorell, 1990). These arguments lead to the following hypothesis:

H7: TMS moderates the mediated relationship between empowering leadership and individual engagement through perceived learning opportunities by strengthening a) the empowering leadership-perceived learning opportunities relationship and b) the perceived learning opportunities-engagement relationship.

Transactive Memory System and Team Performance

TMS can benefit team performance as members rely on transactive memory to efficiently divide responsibility and coordinate unique expertise, while remaining able to coordinate the sharing of expertise (e.g., Austin, 2003; Ellis, 2006; Lewis, 2003). Specifically, TMS allows team members to know each other's specialty of areas, to assign tasks to members who are best capable, and thus to help teams solve problems more quickly and easily (Liang et al., 1995; Moreland, 1999). Therefore, team performance is enhanced because TMS provides the means through which the divergent knowledge possessed by members can be efficiently utilized (e.g., Hollingshead, 1998; Moreland, 1999; Wegner, 1995). Zhang et al. (2007) have suggested that TMS is particularly necessary for complex and nonroutine tasks. Furthermore, TMS allows team members to specialize and use one another as external cognitive aids (Mathieu, Aguinis, Culpepper, & Chen, 2012). Hence, it reduces wasted time and effort searching for information when the team approaches tasks and problems (Austin, 2003).

Several studies have provided empirical support for a positive relationship between transactive memory system and team performance in different research settings with diverse measures of performance. For example, Pearsall et al. (2010) showed that TMS was positively related to team performance in a command-and-control simulation. In a sample of 27 continuing groups in a large apparel and sporting goods company, Austin (2003) found that a group's TMS was positively related to group performance evaluated by both team members and outside strategic management teams. Additionally, using a sample of knowledge worker teams from 104 high-technology firms in China (information technology, telecommunications, biological engineering, and related fields), Zhang et al. (2007) demonstrated a positive relationship between

TMS and team efficiency, work quality, technical innovation, and adherence to schedules and

budgets. Based on these theoretical arguments and empirical evidence, I propose:

H8: TMS is positively related to team performance.

TABLE 1
Summary of Study Hypotheses

Hypothesis 1a	Empowering leadership is positively related to individual perceived role overload.
Hypothesis 1b	Empowering leadership is positively related to individual perceived learning opportunities.
Hypothesis 2a	Role overload is negatively related to individual engagement.
Hypothesis 2b	Role overload mediates the relationship between empowering leadership and individual engagement.
Hypothesis 3a	Perceived learning opportunities are positively related to individual engagement.
Hypothesis 3b	Perceived learning opportunities mediate the relationship between empowering leadership and Individual engagement.
Hypothesis 4	Individual engagement is positively related to performance.
Hypothesis 5	Empowerment climate is positively related to TMS.
Hypothesis 6	TMS moderates the mediated relationship between empowering leadership and individual engagement through role overload by weakening a) the empowering leadership-role overload relationship and b) the role overload-engagement relationship.
Hypothesis 7	TMS moderates the mediated relationship between empowering leadership and individual engagement through perceived learning opportunities by strengthening a) the empowering leadership-perceived learning opportunities relationship and b) the perceived learning opportunities-engagement relationship.
Hypothesis 8	TMS is positively related to team performance.

CHAPTER 3: RESEARCH METHODS

In this Chapter, I describe the research setting in which this dissertation was conducted, the data collection procedures, the measures for the variables in the hypothesized conceptual model, and the analytic techniques that were used to test the hypotheses.

Research Setting and Data Collection Procedure

To test this theoretical model, I collected data from the Research and Development (R&D) teams of fourteen midsize high-technology companies located in major cities (Beijing, Shanghai, Chengdu, and Fuzhou) in China. The R&D teams in these companies consisted of specialized professionals such as software engineers and new product developers. This context is appropriate for my investigation for three reasons. First, research has shown that both empowering leadership and transactive memory system are particularly important for the functioning and performance of work teams consisting of knowledge workers with diverse background, expertise, and information (e.g., Janz, Colquitt, & Noe, 1997; Lewis, 2004; Srivastava et al., 2006). Second, those team members work interdependently and frequently communicate with each other to accomplish their own tasks and cooperatively achieve team goals. Because interdependence imposes demands on the interaction (such as team members providing information, materials, and assistance to one another) necessary to support effective performance (Maynard et al., 2012; Van der Vegt, Van de Vliert, & Oosterhof, 2003), it constitutes an important factor that may impact the team dynamics under empowering leadership. Third, each team has an internal team leader who takes charge of regular team operations and is responsible for team performance. Thus, the team leader is able to observe members' behaviors and is an appropriate rater of team member performance, and team members also have sufficient interactions with the leader to assess his or her empowering behaviors.

The companies and their mangers were identified through the roster of an executive

master of business administration program in a major university in China. Prior to collecting

data, I sent solicitation letters to CEOs or human resource (HR) managers in these companies.

Upon their agreement to take part in the study, I visited these companies to distribute and collect

questionnaires during their working hours. A support letter or an email of notification was sent

out to the potential subjects (or the team leaders) by the CEOs or the HR managers. It has been

suggested by many scholars (e.g., Dillman, 2000; Roth & Bevier, 1998) that management

support is important for gaining the attention of participants and, therefore, increasing the

response rate. In order to minimize the possibility of social desirability biases and encourage

honest responses, confidentiality of the completed surveys was guaranteed. All respondents were

informed that the company would not have access to their individual responses.

Participants and Response Rate

Since the data were collected from China, the entire survey was translated from English

into Chinese and then back translated into English to ensure equivalency of meaning (Brislin,

1980). Data were collected from team members, team leaders, and a supervisor whom the team

leader directly reports to. In the supervisor survey, supervisors were asked to write down the

name of the teams (e.g., design team 1, design team 2, quality control team, etc.) and assessed

the performance of multiple teams. In the leader survey, team leaders were asked to rate

members' performance and provide their own demographic information (including the name of

their team to match with the supervisor). To match team leaders and their members, I first

collected personnel information from HR managers and coded team member and leader surveys.

Each team leader was provided a roster with the name and a unique code of the team members.

The team leader was asked to write down the code of the team members and assessed their

performance accordingly. In doing so, team members' name did not appear on the leader survey so that team leaders may feel more comfortable to provide accurate evaluation. Team member surveys (with a unique code) were distributed according to the roster. In the member survey, team members were asked to evaluate the empowering leadership of the team leader, and the empowerment climate and transactive memory system of the team. They were also asked to report their perception of role overload and learning opportunities, and engagement, as well as provide demographic information.

In total, I distributed 405 team member surveys, 81 team leader surveys, and 22 supervisor surveys. Among them, 376 team members, 76 team leaders, and 22 supervisors returned the surveys, yielding a 92.84%, 93.83% and 100% response rate, respectively. Respondents were excluded from the analyses if supervisors or team leaders did not provide complete assessments of team or member performance. As a result, the final sample comprised 331 individuals in 74 teams from 14 companies. Among the 331 team member participants, the average age was 27 years, the average team tenure was 18 months, 57 percent were male, and 88 percent had bachelor's or higher degrees. As for the 74 team leaders who provided complete demographic information, the average age was 32 years, the average team tenure was 33 months, 88 percent were male, and 91 percent had bachelor's or higher degrees.

Measures

Unless otherwise noted, all the variables were measured by subject responses to the questions on a 7-point Likert-type scale: "To what extent do you agree with the following statement?" (1 = *strongly disagree*; 2 = *disagree*; 3 = *somewhat disagree*; 4 = *neutral*; 5 = *somewhat degree*; 6 = *agree*; 7 = *strongly agree*). The specific measures are described below and

listed also in Appendix A. Cronbach's alpha was calculated for all scale measures in order to demonstrate acceptable levels of scale reliability and are summarized in Table 2.

Empowering leadership. Empowering leadership was measured using a 12-item scale developed by Ahearne et al. (2005) and adapted by Zhang & Bartol (2010). This measure consists of four subscales corresponding to the following dimensions: (1) enhancing the meaningfulness of work (e.g., "My team leader helps me understand the importance of my work to the overall effectiveness of the company"), (2) fostering participation in decision making (e.g., "My team leader makes many decisions together with me", (3) expressing confidence in high performance (e.g., "My team leader believes that I can handle demanding tasks"), and (4) providing autonomy from bureaucratic constraints (e.g., "My team leader allows me to do my job my way"). In particular, because empowering leadership is conceptualized as an individual's perception of leadership toward one's self, an individual referent (i.e., "me") was used. The Cronbach's alphas for the four dimensions were 0.89, 0.85, 0.86, and 0.80, respectively. The Cronbach's alpha for this scale as a whole was 0.90. Keeping with previous research (e.g., Ahearne et al., 2005; Zhang & Bartol, 2010), I averaged all items to create an overall score for empowering leadership.

Perceived role overload. To assess team members' perceptions of role overload, I used Bolino and Turnley's (2005) role overload scale, which was based on items from Schaubroeck, Cotton, and Jennings (1989) and Beehr, Walsh, and Taber (1976). A sample item is "It often seems like I have too much work for one person to do." The Cronbach's alpha for the composite scale was 0.87.

Perceived learning opportunities. To measure team members' perceived learning opportunities, I used a four-item scale adapted from the developmental experience scale

developed by Wayne, Shore, and Liden (1997). Wayne et al.'s measure was developed to measure an individual's perceived learning or development experience in a specific position. However, the construct of perceived learning opportunities was designed to capture the more general experience or perception a team member has. Therefore, I reworded the items to reflect such generalizability in the measure. Moreover, all the four items in Wayne et al.'s (1997) original scale had different response scale, such as 1 = *not at all* to 7 = *a very large extent*. Hence, I also revised the items to make sure all of them can be answered using the unified response scale with 1 = *strongly disagree* to 7 = *strongly agree*. A sample item was "In my job, I am given additional challenging assignments that help me learn." The Cronbach's alpha for the overall scale was 0.75.

Engagement. Individual engagement was measured using the reversed score of the widely-used measurement of burnout, Maslach Burnout Inventory-General Survey (MBI-GS). This measure was developed by Schaufeli, Leiter, Maslach, and Jackson (1996) drawing on the original scale of Maslach Burnout Inventory (MBI) of Maslach and Jackson (1986). The MBI-GS includes three generic burnout dimensions labeled exhaustion, cynicism, and professional efficacy (scores reversed when forming overall burnout score with the other two dimensions) that clearly parallel those in Maslach's (1982) definition (i.e., emotional exhaustion, depersonalization, and lack of personal accomplishment). Moreover, compared with the MBI which applies to human service workers, the MBI-GS includes items that refer to more general, nonsocial aspects of the job.

I used the reverse-scored scale of burnout to measure engagement given its high construct validity and reliability. Moreover, theoretical and empirical evidence has indicated that this measure for burnout is a reasonable representative of engagement. Specifically, engagement and

burnout were initially operationalized as each other's opposites and measured by the reverse pattern of scores on the Maslach Burnout Inventory (Maslach & Leiter, 1997). Recently, there have been other measures (the most often used one was Utrecht Work Engagement Scale, UWES) developed to assess engagement with three dimensions: dedication, vigor (energy), and absorption (Schaufeli & Bakker, 2010; Schaufeli, Salanova, & Gonzalez-Roma, 2002). However, there has been a lack of conceptual alignment and overlapping item content between the dimensions composing burnout and engagement (Cole et al., 2010). Empirically, a recent meta-analyses (Cole et al., 2010) using a sample of 37 studies representing 50 unique samples in 10 nationalities demonstrated that: 1) the dimensions underlying burnout (measured by MBI and MBI-GS) and engagement (measured by UWES) shared substantial variance (correlations ranged from -.55 to -.79); 2) in confirmatory factor analyses, substantial cross loadings between burnout and engagement provided a better fit than alternative models that did not allow for cross-loadings, and 3) the two scales exhibited a nearly identical pattern of association with antecedent and outcome correlates (mean correlations for the three dimensions ranged from -.82 to -.96). Taken together, the results indicated that the conceptual and empirical distinctiveness between engagement and burnout (as measured by MBI-GS and UWES) did not receive support. As a result, given the strong validity constantly shown in previous studies, the MBI-GS is an appropriate measure for employee engagement.

Sample items of the MBI-GS included 1) emotional exhaustion (reversed score to represent energy, 5 items): "Working all day is really a strain for me," 2) professional accomplishment (not reversed, 6 items): "At my work, I feel confident that I am effective at getting things done," and 3) depersonalization (reversed score to represent dedication, 6 items): "I have become less enthusiastic about my work." The Cronbach's alphas for the three

dimensions were 0.93, 0.91, and 0.85, respectively. The Cronbach's alpha for this scale as a whole was 0.88. The use of this scale was permitted by CPP, Inc. and in all copies of the survey, a footnote stating "Copyright © 1986 by CPP, Inc. All rights reserved in all mediums. Published by Mind Garden, Inc.,www.mindgarden.com" was printed to ensure the legitimacy of the use and to preserve the copyright of this scale. For this reason, the full scale of MBI-GS is not listed in Appendix A.

Empowerment climate. Team members were asked to assess the team climate using Kirkman and Rosen's (1999) 14-item scale. This scale has also been used by Chen and his colleagues (e.g., Chen et al., 2007; Chen et al., 2010) and demonstrated good psychometric characteristics. A sample item was "In general, our team leader gives my team many responsibilities." Empowerment climate is conceptualized as team members' shared perception of leadership toward the team. Hence, consistent with this theoretical focus, the team was the focal referent in the empowerment climate ratings, and the data were aggregated to the team level. The Cronbach's alpha for this scale as a whole was 0.93.

Transactive memory system. This variable was assessed by Lewis's (2003) 15-item scale indicating three dimensions (specialization, credibility, and coordination) of transactive memory system. Specialization refers to the extent to which team members understand who possesses what specialized knowledge, credibility concerns the extent to which team members trust the reliability of the knowledge from others, and coordination captures the extent to which team members organize this differentiated knowledge effectively. Sample items included: "Each team member has specialized knowledge of some aspect of our project" (specialization), "I was comfortable accepting procedural suggestions from other team members" (credibility), and "Our team worked together in a well-coordinated fashion" (coordination). Consistent with Lewis's

study, which focused on the whole transactive memory system construct rather than on specific dimensions, I aggregated the data for three dimensions to form a total transactive memory system score. The Cronbach's alphas for the three dimensions were 0.72, 0.65, and 0.83, respectively. The Cronbach's alpha for this scale was 0.82.

Individual performance. Team leaders were asked to rate individual team members' performance on a seven-item scale developed by Williams and Anderson (1991). Team members were asked to indicate the extent to which each item appropriately described their team on a 7-point scale ranging from 1 = *Needs much improvement* to 7 = *Excellent*. Using the procedure described in the Method, each team leader was asked to evaluate multiple team members' performance. A sample performance criterion was "Adequately completes assigned duties." The Cronbach's alpha for this scale as a whole was 0.84.

Team performance. Supervisors were asked to rate each team's performance on a five-item scale used by Van der Vegt and Bunderson (2005). As explained earlier, each supervisor was asked to write down the name of the teams (which was used to match with teams) and then assess the team performance on the five criteria: efficiency, quality of work, productivity, mission fulfillment, and overall performance. Supervisors were asked to indicate the extent to which each item appropriately described the team on a 7-point scale ranging from 1 = *Needs much improvement* to 7 = *Excellent*. The Cronbach's alpha for this scale was 0.82.

Control variables. By definition, control variables are not the focus of the current study, but pose a threat to or confound the proposed relationship as they may affect both the outcome variable and the independent variable (Spector & Brannick, 2011). I identified the necessary control variables based on our review of relevant empowering leadership and TMS literatures in order to rule out the arguments that any of these control variables—rather than hypothesized variables—are impacted to the observed relationships.

At the individual level, I controlled for team members' age, gender, and team tenure. These demographic characteristics have been found to impact individuals' ability to handle challenging tasks and ultimate performance (e.g., Livingston & Judge, 2008; Ng & Feldman, 2008; Wright & Bonett, 2002). I also controlled for intrinsic motivation and psychological empowerment. Prior research has found these variables to be associated with empowering leadership and major individual outcomes such as performance and creativity (e.g., Gong, Huang, & Farh, 2009; Wallace, Johnson, Mathe, & Paul, 2011; Zhang & Bartol, 2010). Intrinsic motivation was assessed using the five-item scale developed by Tierney, Farmer, and Graen (1999). Sample items included "I enjoy finding solutions to complex problems" and "I enjoy engaging in analytical thinking." The Cronbach's alpha for the scale was 0.81. Psychological empowerment was measured using Spreitzer's (1995) twelve-item scale. These twelve items captured four subdimensions of a higher order psychological empowerment: 1) meaning (3 items), "The work I do is very important to me," 2) Competence (3 items), "I am confident about my ability to do my job, " 3) self-determination (3 items), "I have significant autonomy in determining how I do my job," 4) impact (3 items), "My impact on what happens in my team is large." The Cronbach's alpha for this scale as a whole was 0.87. Keeping with previous research (e.g., Spreitzer, 1995, 1996), I averaged all items to create an overall score for psychological empowerment.

At the team level, I controlled for team size by asking team leaders to report the total number of team members. Team size has been found to have a distinct impact on team members' performance and to relate to various team processes (e.g., Chen et al., 2007; Edmondson, 1999). Team interdependence was also controlled for because it has been shown to be an important predictor of the development of transactive memory system (Lewis, 2004; Zhang et al., 2007).

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Task interdependence was measured using the scale developed by Campion, Medsker, & Higgs (1993), which has also been used by Duffy, Ganster, & Pagon (2002) and Kirkman, Rosen, Tesluk, and Gibson (2004) more recently. Team members were asked to what extent they agree or disagree with the description of their team. A sample item was "Members of this team depend on each other for information or materials needed to perform their tasks." The Cronbach's alpha for this scale was 0.89.

Analytical Approach

Prior to hypothesis testing, I conducted confirmatory factor analyses to assess the discriminant validity of the key constructs. Consistent with the conceptualization of empowering leadership, I specified second-order factor models for it (i.e., a higher order empowering leadership construct was indicated by the four sub-dimensions). I compared the hypothesized measurement model with alternative models. Next, I checked the viability of the team level constructs formed via aggregation. To do so, I assessed interrater agreement by computing r_{wg} scores (James, Demaree, & Wolf, 1984) as well as the intraclass correlation coefficients (ICC1) and reliability of team mean (ICC2) values (Bliese, 2000).

I applied Hierarchical Linear Modeling (HLM) with the software HLM 6.06 (Raudenbush, Bryk, Cheong, & Congdon, 2004) to test my Hypotheses 1a, 1b, 2a, 2b, 3a, 3b, and 4 which involved multilevel analyses, as well as Hypotheses 6 and 7 which concerned cross-level interactions. I grand-mean centered the Level 1 variables when testing hypotheses 1-3. According to previous suggestions (e.g., Hofmann & Gavin, 1998; Mathieu & Taylor, 2007), the group-mean centered approach can be very useful for examining cross-level interactions while controlling for the between groups interaction. Therefore, I group-mean centered major Level 1

predictors when testing Hypotheses 6 and 7[1]. Following Hofmann and Gavin's (1998) suggestions, I also added the group means back at the higher level (Level 2) to properly control for the main effects of the lower-level factors when assessing these cross-level interaction effects (Hofmann & Gavin, 1998). Finally, between-group interaction terms were computed and included in order to determine whether a given interaction was cross-level or between group. For parsimonious reasons, I did not report the results of the group means and the between-group interaction in the results section.

Researchers have pointed out the importance of examining the significance of indirect effects when testing mediation hypotheses (Edwards & Lambert, 2007; Preacher & Hayes, 2008; Shrout & Bolger, 2002). Hence, I assessed the significance of the indirect effect of empowering leadership on individual engagement through perceived role overload and learning opportunities using the multilevel regression procedure in HLM proposed by Bauer, Preacher, and Gil (2006). Moreover, I followed Bauer et al.'s (2006) integrative approach to test the moderated mediated hypothesis by examining the indirect effect of empowering leadership on individual engagement at differing levels of TMS.

Finally, I used hierarchical regression to test Hypotheses 5 and 8 because they only involved analysis at one single level.

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[1] I have also tested the cross-level interacting relationships by grand-mean centering the Level 1 predicting variables, and obtained similar results as in the group-mean centering approach. These results demonstrated the robustness of the findings.

CHAPTER 4: RESULTS

In this chapter, I present the results of my data analyses used to examine the theoretical model. I begin with a presentation of the correlations among study variables, followed by the results from the measurement model, hierarchical linear modeling, the multilevel moderated mediation model, and hierarchical regression models.

Descriptive Statistics

Table 2 provides the descriptive statistics, correlations, and inter-item reliability for the variables of the study. The scale reliabilities (shown in parentheses) for all variables are above 0.75. Thus, the instruments provide reliable measures of the variables in this study (Nummally & Bernstain, 1994).

Measurement Model

The hypothesized measurement model consisted of eight latent constructs: two control variables (intrinsic motivation and psychological empowerment), and five key variables (empowering leadership, perceived role overload, perceived learning opportunities, individual engagement, empowerment climate, and transactive memory system). For empowering leadership, psychological empowerment, individual engagement, and transactive memory system, I averaged items into different dimensions, which were used as observed variables to construct latent variables. The confirmatory factor analysis results provided an acceptable fit to the data: $\chi^2_{(154)}$ =1062.72; CFI = .91; TLI = .90; RMSEA=.05; SRMR=.07. In the measurement model, all indicators loaded significantly ($p < .05$) onto the corresponding latent factors. A comparison with a seven-factor model, in which the empowering leadership and empowerment climate were loaded on one factor, showed that the hypothesized model fit the data significantly better than the seven-factor model ($\Delta\chi^2_{(7)} = 129.41$, $p < .001$), which fit the data poorer (CFI = .89; TLI = .88;

RMSEA = .06; SRMR = .07). I also compared the hypothesized model with another seven-factor model in which the variables in team referent (empowerment climate and transactive memory system) were loaded on one factor. I found that the hypothesized model had a better fit than the seven-factor model ($\Delta\chi^2_{(7)}$ = 100.90, p < .001), which didn't fit the data well (CFI = .90; TLI = .88; SRMR = .06; RMSEA = .08). Overall, these results supported the discriminant validity of the measures collected in the study.

Data Aggregation

I conceptualized empowerment climate, transctive memory system, and team task interdependence (control variable) as composition constructs, assessing the extent to which members of a team share perceptions of these constructs. Thus, I examined aggregation statistics for each of these variables to ensure the aggregation was justifiable (James et al., 1984; Kozlowski & Hattrup, 1992) by calculating within-team agreement r_{wg}, intraclass correlation coefficients (ICCl) at group level, and reliability of group mean (ICC2). Median r_{wg} for team-level composition constructs was .98 for empowerment climate (r_{wg} ranging from .83 to 1.00), .97 for TMS (r_{wg} ranging from .75 to 1.00), and .97 for task interdependence (r_{wg} ranging from .59 to 1.00). Thus, within-team consensus exceeded conventional standards for data aggregation (Bliese, 2000). The ICC1 and ICC2 values were .10 and .34 for empowerment climate, .19 and .50 for TMS, and .17 and .38 for task interdependence. The ICC1 values for the three variables were all significant at .01 level, indicating that there were substantial team-level variances in the variables. The relatively low ICC2 value may stem in part from the small sample size at the team level (Bliese, 2000). Taking all the evidence on r_{wg}, ICC1 and ICC2 values into account, I proceeded with aggregation of these variables to the team level (Chen & Bliese, 2002; Kozlowski & Hattrup, 1992).

TABLE 2
Descriptive Statistics, Correlations, and Reliability

	Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
	Individual-level variables (*n* = 331)												
1	Age	27.09	3.61										
2	Gender (0 = male, 1 = female)	.25	43	.06									
3	Team tenure (in month)	18.33	19.43	.39**	.09								
4	Intrinsic motivation	5.33	.82	.01	-.13*	-.09	(.81)						
5	Psychological empowerment	5.24	.68	.02	-.06	-.07	.53**	(.87)					
6	Empowering leadership	5.46	.70	-.03	-.02	-.03	.40*	.51**	(.90)				
7	Perceived role overload	3.85	1.35	-.03	-.05	-.03	.08	-.01	.03	(.87)			
8	Perceived learning opportunities	5.83	.63	-.07	-.06	-.06	.38**	.44	.40**	-.08	(.75)		
9	Individual engagement	4.01	.83	.06	-.04	-.06	.17**	.24**	.19**	-.46**	.38**	(.88)	
10	Individual performance	5.92	.65	.04	.03	.13**	.05	.07	-.06	-.08*	.02	.10*	(.84)
	Team-level variables (*n* = 74)												
1	Team size	6.57	3.46										
2	Team task interdependence	4.74	1.02	.09	(.89)								
3	Empowerment climate	5.74	.38	.01	.05	(.93)							
4	Transactive memory system	5.29	.38	-.13	.09	.57**	(.82)						
5	Team performance	4.33	1.07	-.03	-.17	.08	.26*	(.82)					

Note. Numbers 1–10 in the top row correspond to the variables in the respective sections of the table. Coefficient alpha values are in parentheses and presented along the diagonal. The individual-level correlations were calculated after removing the team-level effects by group-mean centering individual-level variables.
*p < .05, **p < .01 (two-tailed).

Results of HLM Null Models

Prior to testing hypotheses, I justified that HLM was appropriate for analyzing our multilevel data by running null models with no predictors but individual engagement or performance as the dependent variable. In particular, because in the data individual team members were nested in teams and teams were nested in organizations, I ran the three-level null models to examine whether HLM3 was appropriated for the analyses. The results showed that for engagement, there were significant between-group variance ($\chi^2_{(60)} = 81.67$, $p < .05$; ICC1= .09, indicating 9% of variance residing in between work teams) but no significant between-organization variance ($\chi^2_{(13)} = 15.63$, $p > .05$; ICC1 = .00). For individual performance, there were significant between-group variance ($\chi^2_{(60)} = 202.24$, $p < .001$; ICC1= .32, indicating 32% of variance residing in between work teams) but no significant between-organization (Level 3) variance ($\chi^2_{(13)} = 14.35$, $p > .05$; ICC1 = .00). Therefore, the results suggested that HLM2 was appropriate for running analyses on these data.

Hypotheses Testing-HLM Results

The HLM results are shown in Table 3. Hypothesis 1a proposed that empowering leadership is positively related to team members' perceived role overload. As shown in Model 1, empowering leadership was not significantly related to perceived role overload ($\gamma = .08$, $p > .05$). Thus, Hypothesis 1a was not supported. Hypothesis 1b proposed that empowering leadership is positively related to perceived learning opportunities. The results in Model 3 showed that after controlling for empowerment climate, empowering leadership was positively related to perceived learning opportunities ($\gamma = .20$, $p < .01$), supporting Hypothesis 1b.

Hypothesis 2a proposed that perceived role overload is negatively related to engagement. As shown in Model 5, perceived role overload was negatively related to individual engagement

($\gamma = -.24$, $p < .001$). Thus, Hypothesis 2a received support. Hypothesis 3a proposed that perceived learning opportunities are positively related to engagement. The results in Model 5 showed that as expected, there was a positive and significant relationship between perceive learning opportunities and engagement ($\gamma = .38$, $p < .001$), supporting Hypothesis 3a.

Hypotheses 2b and 3b proposed that perceived role overload and learning opportunities mediate the relationship between empowering leadership and employee engagement. I tested the mediation by examining the indirect effect of empowering leadership on team member engagement through each mediator using Bauer et al.'s (2006) integrative multilevel regression procedure. The results showed that the estimate of the indirect effect of empowering leadership on engagement through role overload was -.03. The 95% confidence interval ($CI_{95\%}$) for the estimated effect was (-.09, .03) and included zero. These findings did not support Hypothesis 2b. Further, the estimate of the indirect effect of empowering leadership on engagement through learning opportunities was .08. The 95% confidence interval ($CI_{95\%}$) for the estimated effect was (.03, .13) and did not include zero. This analysis provided support for Hypothesis 3b.

Hypothesis 4 predicted that engagement is positively related to individual performance. As shown in Model 7 of Table 3, there was a positive relationship between engagement and individual performance ($\gamma = .09$, $p < .01$). Therefore, Hypothesis 4 was supported.

Hypotheses 6 proposed that transactive memory system moderates the mediated relationship between empowering leadership and engagement through perceived role overload. Before testing the moderating effects, I compared model fit using the deviance statistics test in HLM (Garson, 2012). Specifically, I compared the fit for the model with the empowering leadership-role overload slope varying across teams (i.e., significant differences in random slopes across teams) to an alternative model with this slope fixed. I also compared model fit for

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the model in which the role overload-engagement slope varying randomly to the model with this slope fixed. Results showed that the model in which empowering leadership-role overload slope was allowed to vary randomly fit significantly better than the one in which the slope was fixed ($\Delta\chi^2_{(2)} = 5.77$, $p < .05$). In addition, the analyses demonstrated that the model in which the role overload-engagement slope was allowed to vary randomly did not fit significantly better than the one in which the slope was fixed ($\Delta\chi^2_{(3)} = .79$, $p > .05$). These results suggested the existence of a potential moderator at the first stage (empowering leadership-role overload relationship) but not at the second stage (role overload-engagement relationship).

Next, I examined the moderating effects of TMS. As shown in Model 2 of Table 3, the moderation of transactive memory system and empowering leadership on perceived role overload was significant ($\gamma = .88$, $p < .001$), but the moderation of transactive memory system and perceived role overload on engagement was not significant ($\gamma = .11$, $n.s.$). Using the multilevel interaction computational tool developed by Preacher, Curran, and Bauer (2006), I plotted the regression equation between empowering leadership and role overload at one standard deviation above and below the mean of transactive memory system (Aiken & West, 1991). The plot in Figure 2 suggested that at lower (rather than higher) levels of transactive memory system, empowering leadership was more positively associated with team members' perceived role overload. The simple slope test confirmed my findings by showing that the relationship between empowering leadership and role overload was positive and significant under the low TMS condition ($\beta = .10$, $p < .01$), but it was not significant when transactive memory system was high ($\beta = -.02$, $p > .05$). Thus, these findings partially supported Hypothesis 6.

Hypotheses 7 predicted that transactive memory system moderates the relationship

between empowering leadership and engagement through perceived learning opportunities. Similarly, I used the deviance statistics test to check whether there was significant variability across teams in the empowering leadership-learning opportunities relationship and learning opportunities-engagement relationship. Results showed that the model with empowering leadership-learning opportunities slope varying randomly did not fit better than the one with the slope fixed ($\Delta\chi^2_{(2)}$ = 1.17, p > .05). I also found that the model in which perceived learning opportunities-engagement slope was allowed to vary randomly fit the data better than the one in which the slope was fixed ($\Delta\chi^2_{(3)}$ = 8.23, p < .05). Together, these results suggested the existence of potential moderator at the second stage (empowering leadership-learning opportunities relationship) and justified the examination of TMS as a cross-level moderator.

As shown in Model 4 of Table 3, the moderation of transactive memory system and empowering leadership on perceived learning opportunities was not significant (γ = .01, p > .05), but the moderation of transactive memory system and perceived learning opportunities on engagement was significant (γ = .26, p < .05). I plotted the regression equation between learning opportunities and engagement at two levels of TMS. The plot in Figure 3 suggested that at higher (rather than lower) levels of TMS, individual perceived learning opportunities were more positively associated with engagement. The simple slope test showed that the relationship between perceived learning opportunities and engagement was positive and significant in the low TMS condition (β = .02, p < .01), and was stronger in the high TMS condition (β = .10, p < .01). Hypothesis 7 was partially supported.

I further used Bauer et al.'s (2006) procedure to examine the moderated mediation relationships in an integrated manner. I simultaneously included both perceived role overload and learning opportunities as mediators. I found that with the addition of transactive memory

system as a moderator at both the first (i.e., the empowering leadership-mediator path) and the second stages (i.e., the mediator-engagement path), the indirect effect through role overload and the indirect effect through learning opportunities were both significantly differed as a function of the moderator. Specifically, the indirect effect of empowering leadership on engagement through role overload was positive and significant when transactive memory system was low (.04; $CI_{95\%}$ = .01, .08; 1 SD below the mean), but was not significant when transactive memory system was high (-.02; $CI_{95\%}$ = -.05, .02; 1 SD above the mean). Moreover, the indirect effect through learning opportunities was positive and significant when TMS was low (.02; $CI_{95\%}$ = .00, .05; 1 SD above the mean), and even stronger when TMS was high (.05; $CI_{95\%}$ = .01, .09; 1 SD below the mean). These findings were consistent with the HLM results and together, they provided evidence that partially supported Hypothesis 6 and Hypothesis 7.

Hypotheses Testing-Hierarchical Regression Results

Hypotheses 5 and 8 were tested in hierarchical regression because they involved one-level analyses. The hierarchical regression results are shown in Table 4. Hypothesis 5 predicted that empowerment climate is positively related to transactive memory system. As shown in Model 1 of Table 4, after controlling for team size and task interdependence, the relationship between empowerment climate and transactive memory system was positive and significant (β = .57, p < .05). Therefore, Hypothesis 5 was supported. Hypothesis 8 proposed that transactive memory system is positively related to team performance. Results in Model 2 of Table 4 showed that the relationship between empowerment climate and transactive memory system was positive and significant (β = .46, p < .01). Therefore, Hypothesis 8 was supported.

TABLE 3
Hierarchical Linear Regression Results

Variables	M1	M2	M3	M4	M5	M6	M7
	DV: Perceived role overload		DV: Learning opportunities		DV: Individual engagement		DV: Performance
Level 1- Individual							
Age	-0.03	-0.03	0.00	0.00	0.01	0.11	0.01
Gender	-0.14	-0.12	0.00	0.00	-0.16	-0.16	0.06
Team tenure	0.00	0.00	0.00	0.00	0.00	0.00	0.01^{**}
Intrinsic motivation	0.15	0.17	0.11^{*}	0.11^{*}	0.00	0.00	0.06
Psychological empowerment	-0.19	-0.14	0.23^{**}	0.22^{**}	0.13	0.12	-0.05
Empowering leadership	0.08	0.00	0.20^{**}	0.20^{**}	0.04	0.06	0.04
Perceived role overload					-0.24^{***}	-0.24^{***}	-0.05^{*}
Perceived learning opportunities					0.38^{***}	0.38^{***}	0.02
Team member engagement							0.09^{***}
Level 2 - Team							
Team size	0.04^{*}	0.05^{**}	0.01	0.01	0.01	0.01	0.00
Team task interdependence	0.01	0.01	-0.01	-0.01	0.00	0.00	0.02
Empowerment climate	-0.70	-0.74	0.26	0.23	0.17	0.18	0.01
Transactive memory system	-0.19	-0.22	0.00	-0.01	0.07	0.10	0.01
Cross-level Interaction							
Empowering leadership * Transactive memory system		-0.88^{***}		0.01		-0.08	0.05
Perceived role overload * Transactive memory system						0.11	-0.01
Perceived learning opportunities * Transactive memory system						0.26^{*}	-0.12
Pseudo $R^{2\,b}$	0.008	0.017	0.237	0.228	0.326	0.330	0.051

Note. N (Level 1) = 331; N (Level 2 = 74). Coefficient estimations are fixed effects gammas (γ) with robust standard errors. Hypothesized variables are italicized and corresponding coefficients bolded. [a] Sum of the total variance attributable to within and between variance components (Snijders & Bosker, 1999). $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

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TABLE 4
Hierarchical Regression Results

Variables	M1	M2
	DV[b]: Transactive memory system	DV: Team performance
	Standardized coefficients (*s.e.*)	Standardized coefficients (*s.e.*)
Team size	-.14 (.01)	.06 (.04)
Task interdependence	.07 (.03)	-.22 (.11)
Empowerment climate	.57[*] (.10)	.28 (.43)
Transactive memory system		.46[**] (.43)
R^2	.34[***]	.15[*]
F	12.43[***]	2.58[*]

[a] n = 74. Standardized regression coefficients are reported.
[b] DV: dependent variable.
[*] $p < .05$, [**] $p < .01$, [***] $p < .001$

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FIGURE 2
Moderating Effects of Transactive Memory System
on Empowering Leadership-Perceived Role Overload Relationship
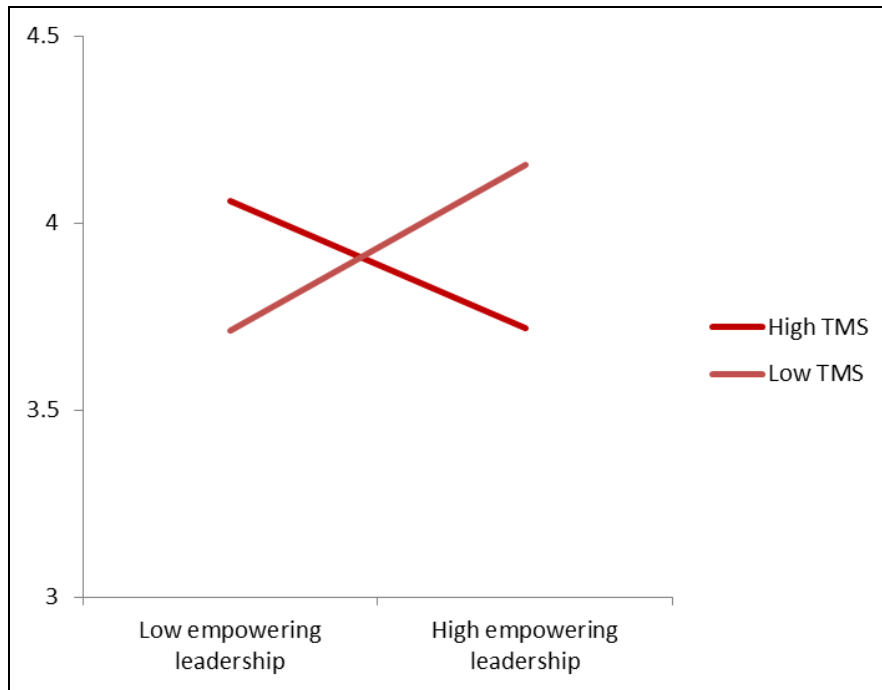
FIGURE 3
Moderating Effects of Transactive Memory System
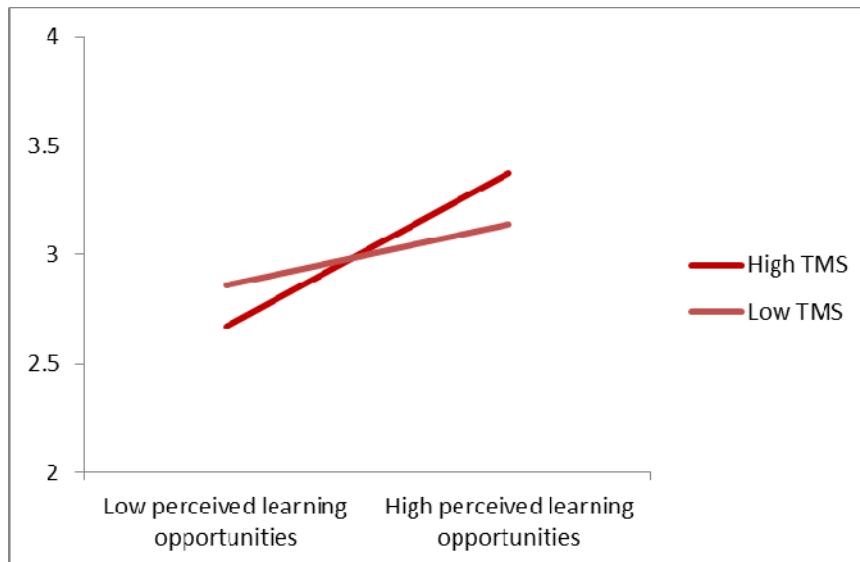**on Perceived Learning Opportunities-Individual Engagement Relationship**

TABLE 5
Summary of Study Results

Hypothesis 1a	Empowering leadership is positively related to individual perceived role overload.	Not supported
Hypothesis 1b	Empowering leadership is positively related to individual perceived learning opportunities.	Supported
Hypothesis 2a	Role overload is negatively related to individual engagement.	Supported
Hypothesis 2b	Role overload mediates the relationship between empowering leadership and individual engagement.	Not supported
Hypothesis 3a	Perceived learning opportunities are positively related to individual engagement.	Supported
Hypothesis 3b	Perceived learning opportunities mediate the relationship between empowering leadership and Individual engagement.	Supported
Hypothesis 4	Individual engagement is positively related to performance.	Supported
Hypothesis 5	Empowerment climate is positively related to TMS.	Supported
Hypothesis 6	TMS moderates the mediated relationship between empowering leadership and individual engagement through role overload by weakening a) the empowering leadership-role overload relationship and b) the role overload-engagement relationship.	H6a supported; H6b not supported
Hypothesis 7	TMS moderates the mediated relationship between empowering leadership and individual engagement through perceived learning opportunities by strengthening a) the empowering leadership-perceived learning opportunities relationship and b) the perceived learning opportunities-engagement relationship.	H7a not supported; H7b supported
Hypothesis 8	TMS is positively related to team performance.	Supported

CHAPTER 5: DISCUSSION

This dissertation combined the job demands-control model (Karasek, 1979; Karasek & Theorell, 1990) and transactive memory system theory (e.g., Austin, 2003; Lewis, 2003; Lewis & Herndon, 2011; Lewis et al., 2005; Wegner, 1986) to reveal both positive and negative outcomes of empowering leadership and identify TMS as a critical team resource that can be prompted by empowerment climate, which in turn carries important implications for team and individual performance. The theoretical model was tested using data that were collected from 331 individuals from 74 Research and Development teams in 14 high-technology companies in China. Hypotheses were tested through hierarchical linear modeling, hierarchical regression analyses, and the Monte Carlo procedure for multilevel moderated mediation relationships.

Theoretical Implications

Overall, the theoretical model and the findings in this dissertation offer several important contributions to extant research. First of all, this study contributes to the empowering leadership literature by integrating the job demands-control model to provide theoretical explanations for the "double-edged sword" effects of empowering leadership. To do so, I simultaneously examined the often investigated positive outcomes and the often ignored personal costs associated with empowering leadership. Efforts in this regard explicitly address a dilemma inherent in empowering leadership – while it is mostly praised as an important means to motivating employees (Conger & Kanungo, 1988; Gagné & Deci, 2005; Thomas & Velthouse, 1990), empowered employees are challenged by increased role demands such as taking additional responsibilities, making high-stake decisions, and meeting high expectations, which may, in turn, yield undesirable individual outcomes (Humborstad & Kuvaas, 2013; Ogden et al., 2006).

Specifically, I found that empowering leadership was positively related to individual team member's perceived learning opportunities, which was then related to increased engagement and enhanced performance. Contrary to my expectation, though, empowering leadership did not necessarily lead to individual perceived role overload. Yet this relationship was positive and significant when there was a lack of transactive memory system in the team. These findings enrich extant empowering leadership literature by providing support for the argument that empowering leadership may generate job demands that consume employees' energy (e.g., Humborstad & Kuvaas, 2013; Ogden et al., 2006), especially when there were no additional resources in the working contexts. These findings thus uncover an energy depletion effect of empowering leadership that has not been previously theorized and tested.

Second, this inquiry takes a multilevel approach to investigate empowering leader behaviors and reveals the mechanisms through which empowering leader behaviors at different levels jointly shape favorable outcomes. Previous studies of empowering leadership have been conducted at individual level (e.g., Ahearne et al., 2005; Zhang & Bartol, 2010) or team level (e.g., Wallace et al., 2011; Srivastava et al., 2006; Yun et al., 2005). To my best knowledge, there has been no systematic exploration regarding the influence mechanisms of empowering leader behaviors at both individual and team levels as well as the interplay between the team-level processes and individual-level processes. Accordingly, the present study uniquely revealed that TMS, influenced by empowerment climate, not only benefited team performance, but also facilitated the effect of individual-level empowering leadership to help team members cope with perceived job demands, and eventually achieve superior performance.

These findings have three significant contributions to a variety of literatures. First, they connect empowering leadership research at the team and individual levels to demonstrate that not

only a team, but also empowered individual team members, fare better when others in the team are also empowered. This multilevel approach helps better explain outcomes of leader empowering behaviors at each level and their interrelationships, and provides a more integrated understanding of previously disparate research of empowering leader behaviors at different levels. It also sets the stage for further research to systematically investigate the boundary conditions for empowering leadership. For instance, it provides insights for future research to identify individual and organizational resources that can mitigate the strain process of empowering leadership and maximize its benefits. Second, these findings respond to the call for a more comprehensive way of conceptualizing follower readiness that resides at the collective level in order to extend aspects of situational leadership theory (Lorinkova et al., 2013). As pointed out by these scholars, the current conceptualization of follower empowerment readiness tends to "focus on the maturity, commitment, and skill level of individual followers but to neglect the critical team processes and emergent states" (Lorinkova et al., 2013: 590) that allow empowering leadership to be effective at both individual and team levels. This study thus contributes to situational leadership theory by identifying TMS as a marker of team development and readiness that help explain why empowering climate helps facilitate higher individual performance. Third, by incorporating the JD-C model and TMS theory, this study identifies the multilevel outcomes of empowering leader behaviors that uniquely captures its impacts on individual (perceived role overload and learning opportunities) and team cognition (TMS, the shared understanding of "who knows what" in the team; Lewis, 2003). Hence, this study broadens the empowering leadership literature that has mostly taken a motivational approach and focused on influence mechanisms such as intrinsic motivation and psychological empowerment (e.g., Chen et al., 2010; Conger & Kanungo, 1988; Zhang & Bartol, 2010).

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Furthermore, this study adds to the growing TMS literature by suggesting empowerment climate as a pivotal antecedent of TMS. In addition to the task and reward structures that are frequently investigated in the TMS literature (e.g., Brandon & Hollingshead, 2004; Lewis, 2004; Zhang et al., 2007), the findings implied that leaders can play an important role in facilitating TMS in the team, in particular, by creating an empowerment climate. Because empowerment climate has not been sufficiently investigated in the transactive memory system literature, this study highlights the important role of leader empowerment in facilitating team-level knowledge management. I also join scholars who advocate that empowering leaders can enhance team shared cognitive understanding to effectively perform and adapt (e.g., Lorinkova et al., 2013; Srivastava et al., 2006) to position TMS as such a team cognitive process. Moreover, the informational resource perspective of TMS states that team members are more likely to benefit from their teammates by effectively obtaining the information and expertise relevant to the problem at hand when they possess a shared understanding of "who knows what" in the team (Richter et al., 2012). Therefore, the cross-level moderating effects of TMS provide evidence to the emerging view of TMS as a valuable team informational resource that individuals can take advantage of (Richter et al., 2012).

Finally, this study provides empirical support to the job demands-control model, and extends the model to a multilevel context. For one thing, the recent theoretical development of the JD-C model (Karasek & Theorell, 1990; Parker & Sprigg, 1999; Taris & Feij, 2004) has included both stress and learning related variables as important outcomes of the combination of the job demands and employee's control over their job. In particular, researchers have pointed out the need to "learn more about how to simultaneously minimize the stress associated with excess job demands and maximize employee learning and development" (Parker & Sprigg, 1999:

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925). The effort in examining both perceived learning opportunities and role overload while considering how TMS may attenuate the negative impacts of empowering leadership on role overload thus directly shed lights on this issue. For the other thing, this study identifies TMS as a team-level informational resource that can influence individual perceptions of and reactions to role demands and personal control offered by empowering leaders. Therefore, it highlights the importance of considering team-level processes in the job demands-control model in order to enhance its explanatory power in a world of widespread movement toward team-based practices (Chen et al., 2010; Hackman, 2002; Kozlowski & Bell, 2003). It also underscores the value of a multilevel perspective when applying and enriching JD-C model in the future (Ilies et al., 2010).

Practical Implications

In addition to the contributions to theory and literature, the findings from this dissertation have a number of practical implications for managers. First of all, this study uniquely demonstrated a "double-edged sword" effect of empowering leadership. That is, it offered more learning opportunities while also generating greater role overload perceptions among individual employees under some circumstances. On one hand, the positive impact of empowering leadership on individual perceived learning opportunities is consistent with previous research (e.g., Yun et al., 2005) in suggesting that to give employees opportunities to think, to apply their knowledge, and to acquire new skills, leaders should delegate responsibility to followers. In contrast, less empowering leaders who make all decisions themselves and expect followers to carry out their orders with little control over the tasks may harm employee development and motivation in the long run.

On the other hand, based on the finding of the positive relationship between empowering leadership and employee role overload when TMS was low, we suggest managers be mindful of

the possibility that increased role demands associated with empowering leadership may overwhelm employees, especially when outside cognitive resources are lacking. It may be beneficial for the organization and managers to make more informational resources available and accessible in the working contexts to provide sufficient support for empowered individuals. For example, the organization can provide formal training for the team to provide opportunities for them to develop a shared understanding of "who knows what" (e.g., Liang et al., 1995). Team leaders can also create a climate that encourage team members to freely exchange and communicate with each other regarding their task assignments, expertise, and solutions (e.g., Zhang et al., 2007). Related, the findings caution team leaders to monitor the extent to which they empower their team members as well as the amount of challenges involved in the empowerment because such aspects can create situations of role overload that are counterproductive to individual engagement and performance. It is warranted that empowering leaders allow some time and help individual members to develop their ability to handle the additional and often more challenging role requirements.

Moreover, this study suggests that empowerment climate at the team level is positively related to the development of TMS, which then benefits the team performance and enhances individual effectiveness. Therefore, team leaders may find it valuable to demonstrate empowering behaviors toward the whole team (including raising its level of autonomy and responsibility, promoting collaborative decision making, and supporting information sharing and teamwork) and create an empowerment climate within the team. Additionally, these findings highlight the importance of empowering leader behaviors in managing knowledge workers, especially facilitating knowledge exchange and collaborative use of their specialized expertise to achieve collective objectives.

Limitations and Future Directions

The contributions of this research should be viewed in light of its limitations, which I hope offer several promising avenues of further inquiry. First, although I collected multilevel multi-source data to test the theoretical model, the key variables in the study were measured within the same time frame. Consequently, this research design precluded me from uncovering how the impacts of leader empowering behaviors unfold over time. Research has suggested that when the positive influence of empowering leadership for individual performance and for top management teams found in the literature (e.g., Ahearne et al., 2005; Srivastava et al., 2006; Zhang & Bartol, 2010) was extended to action and project teams that undergo team development (Kozlowski & Bell, 2003), empowering leadership may come at an initial performance cost (Lorinkova et al., 2013). This is because it takes time for team members to learn about their task environment and each other's areas of expertise in order to integrate their efforts and foster routines to coordinate their behaviors (Kozlowski et al., 1999; Pearsall et al., 2010). Therefore, a useful next step would be to conduct longitudinal studies to examine both advantages as well as individual and performance costs of empowering leadership at different stages of team development.

Second, I focused on how work teams served as critical information resources that can facilitate the individual-level empowering leadership process, especially reducing its potential negative impact through role overload. A promising direction for future research is to consider other individual-level resources that may alter the pattern of these impacts of empowering leadership. For example, Ahearne et al. (2005) suggested that individual empowerment readiness (i.e., knowledge and experience in a given position) may play a role in moderating the effects of empowering leadership on individual adaptability and self-efficacy. Situational leadership theory

(Evans, 1970; Fiedler, 1967; Podsakoff, MacKenzie, Ahearne, & Bommer, 1995) suggests that more ready individuals (i.e., those with higher levels of job knowledge and experience) would be better suited to be empowered than less ready individuals because they are more prepared to "take the ball and run with it" (Hersey & Blanchard, 1982). However, Ahearne and colleagues demonstrated that empowering leadership exercised a greater effect on employees with lower knowledge and experience. Given this unexpected finding, it would be interesting to directly examine the moderating role of empowerment readiness and other relevant individual characteristics on the relationship between empowering leadership and role overload as well as learning opportunities.

Third, this study identified TMS as an important team-level emergent state that helps transform the influence of leader empowering behaviors at the team level toward each individual member. I did so in an attempt to reflect and address the value of team context as a source of informational or cognitive resources that facilitate individual performance under empowerment. According to the extant literature, team-level empowering leadership or empowerment climate may also have the potential to promote other team processes and states, including team learning, coordination, psychological empowerment, collective efficacy, and shared mental model (e.g., Lorinkova et al., 2013; Srivastava et al., 2006; Wallace et al., 2011; Yun et a., 2005). Thus, exploring the cross-level impacts of these team dynamics on the individual-level empowering leadership processes as well as the relative importance of these variables will be a valuable future research direction.

Conclusion

As a conclusion, this dissertation synthesizes job demands-control model and transactive memory system theory to explore the double-edged sword effects of empowering leadership as

well as team processes that can help overcome the potential negative impacts of empowering leadership. The findings indicate that empowering leadership can enhance individual engagement and performance by providing increased learning opportunities. However, it also harms individual outcomes by increasing their perceptions of role overload when there is a lack of transactive memory system in the team. Moreover, by creating an empowerment climate, leaders can help foster the development of TMS, which in turn, benefits team performance as well as produces cross-level influences on individual team members by reducing role overload and boosting learning opportunities associated with empowering leadership. Overall, this dissertation provides important foundations that will hopefully inspire more future research on different outcomes of leader empowering behaviors and thus to provide more complete understanding of the intricacies inherent in the leader empowerment processes at multiple levels.

Empowering Leadership
Source: Ahearne et al., 2005, also used by Zhang & Bartol, 2010.

Enhancing the meaningfulness of work:
1. My team leader helps me understand how my objectives and goals relate to that of the company.
2. My team leader helps me understand the importance of my work to the overall effectiveness of the company.
3. My team leader helps me understand how my job fits into the bigger picture.

Fostering participation in decision making:
4. My team leader makes many decisions together with me.
5. My team leader often consults me on strategic decisions.
6. My team leader solicits my opinion on decisions that may affect me.

Expressing confidence in high performance:
7. My team leader believes that I can handle demanding tasks.
8. My team leader believes in my ability to improve even when I make mistakes.
9. My team leader expresses confidence in my ability to perform at a high level.

Providing autonomy from bureaucratic constraints:
10. My team leader allows me to do my job my way.
11. My team leader makes it more efficient for me to do my job by keeping the rules and regulations simple.
12. My team leader allows me to make important decisions quickly to satisfy customer needs.

Empowerment Climate
Source: Chen et al., 2007, 2010

In general, our team leader...
1. gives my team many responsibilities
2. makes my team responsible for what it does
3. asks the team for advice when making decisions
4. uses team suggestions and ideas when making decisions
5. avoids overcontrolling the activities of the team
6. encourages my team to take control of its work
7. allows my team to set its own goals
8. encourages my team to come up with its own goals
9. stays out of the way when the team works on its performance problems
10. encourages my team to figure out the causes/solutions to its problems
11. tells the team to expect a lot from itself
12. encourages my team to go for high performance
13. trusts my team

14. is confident in what my team can do

Role overload
Source: Bolino & Turnley, 2005

1. The amount of work I am expected to do is too great
2. I never seem to have enough time to get everything done at work
3. It often seems like I have too much work for one person to do

Perceived learning opportunity
Source: Wayne, Shore, & Liden, 1997

1. My job provides me with significant training and development opportunities
2. In my job, I am assigned tasks that enable me to develop and strengthen new skills.
3. In my job, I am given additional challenging assignments that help me learn
4. My job provides opportunities for difficult assignments that help me develop my skills.

Transactive Memory System
Source: Lewis, 2003

Specialization
1. Each team member has specialized knowledge of some aspect of our project.
2. I have knowledge about an aspect of the project that no other team member has.
3. Different team members are responsible for expertise in different areas.
4. The specialized knowledge of several different team members is needed to complete the project deliverables.
5. I know which team members have expertise in specific areas.

Credibility
6. I am comfortable accepting procedural suggestions from other team members.
7. I trust that other members' knowledge about the project is credible.
8. I am confident relying on the information that other team members bring to the discussion.
9. When other members give information, I feel no need to double-check it for myself.
10. I have much faith in other members' "expertise."

Coordination
11. Our team works together in a well-coordinated fashion.
12. Our team has very few misunderstandings about what to do.
13. Our team rarely needs to backtrack and start over.
14. We accomplish tasks smoothly and efficiently.
15. There is little confusion about how we go about accomplishing tasks.

Individual (Team Member) Performance
Source: Williams & Anderson, 1991

1. Adequately completes assigned duties.

2. Fulfills responsibilities specified in job description.
3. Performs tasks that are expected of him/her.
4. Meets formal requirements of the job.
5. Engages in activities that will directly affect his/her performance evaluation.
6. Carries out aspects of the job he/she is obligated to perform.
7. Performs essential duties.

Team Performance
Source: Van der Vegt & Bunderson, 2005

1. Efficiency
2. Quality
3. Productivity
4. Mission fulfillment
5. Overall performance

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